INSTREAM FLOW CHECKLIST

NAME BLM (SAFFORD) NO. 33-90103

APPLICANT	DATE	INIT.
Preapplication Meeting		
Submit Application		
Post Public Notice	10/15/85	TRW
Submit Affdavit of Posting		
Protest (if any) Resolved		
Collect Data (Min. 1 Year)		
Submit Study ☐ Outline ☐ Draft ☐ Final		
Review/Comment Draft Permit		
Submit Permit Fees		
Submit Proof & Affidavit		
Submit Minimum of 4 Years Streamflow Data		
Submit Analysis of Streamflow Data & Documentation		
Review/Comment Draft CWR		
Submit CWR Fees		
Continue Streamflow Measurement		

ADWR - HYDRO	DATE	INIT.
Preapplication Meeting		
Site Visit		
Flow Measurement		
Review Study ☐ Outline ☐ Draft ☐ Final		
Review Data		
Review Protests (if any)		
Approve for Permit		
Review Draft Permit		
Review Data for CWR		
Approve for CWR		
Review Draft CWR		

ADWR - SURFACE WATER	DATE	INIT.
Preapplication Meeting		
Receive Application ☑ Acpt'd ☐ Complete ☐ Rej'd	8/12/85	TRW
GIS Mapping		
Prepare Notice of Intent	10/8/85	TRW
Receive Affidavit of Posting (Not Date Stamped)	10/25/85	TRW
Protest Received (4)	11/5/85	TRW
Protest Withdrawn (2) 2 others uncertain		TRW
Draft Permit		
Sent to Applicant For Review	1/22/92	TRW
Sent to Hydro For Review		
Permit Fees Requested	2/4/92	TRW
Permit Fees Received	2/21/92	TRW
Final Permit Approved & Signed by Asst. Director	2/17/92	TRW
Permit Issued	2/22/92	TRW
Proof & Affidavit Received		
Draft CWR		
Sent to Applicant For Review		
Sent to Hydro For Review		
CWR Fee Requested		
CWR Fee Received		
Final CWR Approved & Signed by Asst. Director	4/3/92	TRW
CWR Issued	4/3/92	TRW

AZ GAME & FISH	DATE	INIT.
Permit Approved		

* this application was assigned to BLM in 1986

FCSPRNCA0588

ARIZONA DEPARTMENT OF WATER RESOURCES
15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

April 14, 1992

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

Bureau of Land Management
Attn: Mr. Del Molitor
425 East 4th Street
Safford, Arizona 85546

Re: Instream Flow Certificate of Water Right No. 90103

Dear Del:

The Director of the Department of Water Resources is pleased to forward the enclosed Certificate of Water Right for your records.

The certificate is evidence of your water right and you may wish to record the document with the County Recorder. A duplicate copy of the Certificate is maintained in the official records of this Department. The $25.00 certificate fee for the certificate has been charged to BLM's fee credit account #3.

Your patience in complying with the requirements of the Public Water Code in perfecting this water right is appreciated.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:asm

Enclosure

FCSPRNCA0589

Certificate of Water Right

STATE OF ARIZONA

County of Cochise

Certificate No. 90103.0000

Arizona Department of Water Resources
Operations Division
15 South 15th Avenue
Phoenix, Arizona 85007

THIS IS TO CERTIFY, THAT the United States Department of the Interior, Bureau of Land Management, Safford District Office, of Safford, **State of Arizona, has made proof to the satisfaction of the DEPARTMENT OF WATER RESOURCES of Arizona, of a right to the use of** the waters flowing in the San Pedro River, a tributary of the Gila River, **for** recreation and wildlife, including fish, **under Application No.** 33-90103.0001, **Permit No.** 33-90103.0000, **of the DEPARTMENT OF WATER RESOURCES, and that said right to the use of said waters has been perfected in accordance with the laws of Arizona, and made and entered of record in the Records of the Department of Water Resources at Phoenix, Arizona, under Certificate No.** 90103.0000; **that the priority of the right hereby confirmed dates from** August 12, 1985; **that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed** an amount expressed as specified flow rates and cumulative totals as gaged at the beginning of the reach of the San Pedro River at the United States Geological Survey streamflow gage #9470500 near Palominas, Arizona and at the beginning of the reach of the San Pedro River at the United States Geological Survey streamflow gage #9471000 near Charleston, Arizona. The specified flow rates (cubic-feet/second) at the gage stations, expressed as a monthly median of mean daily flow, are as follows:

Month	Palominas Gage	Charleston Gage
October	3.7	12.2
November	3.6	13.6
December	5.5	17.1
January	7.9	19.5
February	8.6	20.3
March	6.3	18.9
April	2.5	12.2
May	1.2	7.9
June	0.6	4.2
July	7.0	19.0
August	7.0	19.0
September	7.0	19.0
Volume (acre-feet/year)	3,666	11,028

A description of the lands under such right, and to which the water hereby confirmed is appurtenant and put to beneficial use, is as follows: The beneficial use will occur instream along the meandering course of the San Pedro River. The instream use will start at a point within the Northwest quarter of the Northwest quarter (NW¼NW¼), Section 22, Township 23 South, Range 22 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northeast quarter (NE¼NE¼), Section 11, Township 21 South, Range 21 East, and from a point within the Northeast quarter of the Northeast quarter (NE¼NE¼), Section 11, Township 21 South, Range 21 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northwest quarter (NE¼NW¼), Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona.

The right to the use of water aforesaid hereby confirmed is restricted to the places of use herein described. Water will not be diverted from the natural channel. There shall be no impoundments of public water, nor interference with the natural flow of the San Pedro River. There shall be no consumptive use of public waters other than is caused by natural habitat (flora and fauna). There shall be no interference with nor detrimental effect upon prior vested water rights.

Witness, the seal and signature of the DEPARTMENT OF WATER RESOURCES.

affixed this 3rd **day of** April, 1992

Herb Dishlip

Deputy Director (Attest)
Herb Dishlip

Elizabeth Ann Rieke

Director
Elizabeth Ann Rieke

The Department of Water Resources must be notified if the above named person(s) changes his address or conveys ownership of the land or of the water right to another person(s) pursuant to A.R.S. § 45-164, B.

FCSPRNCA0591

DEPARTMENT OF WATER RESOURCES
OPERATIONS DIVISION

MEMORANDUM

4-14-92
Check rec'd
to accty.
Voided

To: DWR Accounting

FROM: Patti Rocko, Surface Water Rights Systems

SUBJECT: Recording fee for Certificate of Water Right No. 90103

DATE: February 19, 1992

Please prepare the following check for the indicated amount for the recording of the Subject Certificate of Water Right. The funds are to be drawn from the General Fund.

1 check payable to the Cochise County Recorder, $3.00

When the check is prepared, please return it to Patti Rocko in the Operations Division.

FCSPRNCA0592

ARIZONA DEPARTMENT OF WATER RESOURCES
HYDROLOGY DIVISION

MEMORANDUM

TO: Dennis Kimberlin, Operations Division

FROM: Tom Harbour

DATE: March 27, 1992

SUBJECT: Instream Flow Permit 33-90103.0000

The Bureau of Land Management has requested that the referenced permit be advanced to Certificate status. In the case of instream flow applications, a minimum of four years of streamflow data constitutes proof of appropriation and evidence that the water is being put to a beneficial use. Two U.S.G.S. streamgages are located within the reach and have periods of record exceeding 60 years in length. Due to the availability of these long-term streamflow measurements it appears that the Department's criteria for Proof of Appropriation has been met, therefore, this permit should be advanced to Certificate status. Please let me know how you intend to proceed. Thanks.

cc: Greg Wallace, Hydrology
Greg Bushner, Hydrology

FCSPRNCA0593

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

February 25, 1992

Bureau of Land Management
Attn: Del Molitor
425 East 4th Street
Safford, Arizona 85546

Re: Permit to Appropriate Public Water No. 33-90103.0000

Dear Mr. Molitor:

Your application for appropriative permit has been approved. Enclosed please find the approved Permit to Appropriate Public Water.

Also, enclosed are Proof of Appropriation of Water and Affidavit of Appropriator forms. These two forms must be completed and filed with the Department of Water Resources for each permit after the means of diversion or storage have been constructed and after the appropriated water has been applied to the permitted beneficial uses. The Affidavit of Appropriator must be notarized and supported by the affidavit of two witnesses.

The Proof of Appropriation of Water is an important document which should show the amount of water beneficially used. Please answer each applicable question completely, carefully and correctly, after reviewing the terms of your permit, the application and any information which you have compiled regarding this water use. You may submit attachments with the Proof.

The information set forth in the Proof will be reviewed prior to the issuance of a Certificate of Water Right. This review may include a field examination of the appropriation.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:pr

Enclosures

FCSPRNCA0594

Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

PERMIT TO APPROPRIATE PUBLIC WATER OF THE STATE OF ARIZONA

Application No. 33-90103.0001
Permit No. 33-90103.0000

This is to certify that pursuant to the provisions of Arizona Revised Statute 45-153, the United States Department of the Interior, Bureau of Land Management, Safford District Office, 425 East 4th Street, Safford, Arizona, is granted an appropriative permit subject to the following terms:

1. Source: The public waters flowing in the San Pedro River.

2. Types of use, and amounts: Recreation and wildlife including fish. The cumulative amount of use for both types of uses is expressed as an annual volume of flow of the San Pedro River as gaged at the beginning of the specific reach as described in item 3. The appropriated flow is further described as a monthly median of mean daily flow as gaged at the beginning of the reach near Palominas at the United States Geological Survey streamflow gage # 9470500 and at the beginning of the reach near Charleston at streamflow gage # 9471000. The flow rate appropriated, and cumulative total, is as follows:

Flow Rate (cubic-feet/second)

Month	Palominas Gage	Charleston Gage
October	3.7	12.2
November	3.6	13.6
December	5.5	17.1
January	7.9	19.5
February	8.6	20.3
March	6.3	18.9
April	2.5	12.2
May	1.2	7.9
June	0.6	4.2
July	7.0	19.0
August	7.0	19.0
September	7.0	19.0
Volume (acre-feet/year)	3,666	11,028

3. Point of diversion and place of use: Water will not be diverted from the natural channel. The beneficial use will occur instream along the meandering course of the San Pedro River. The instream use will start at a point within the Northwest quarter of the Northwest quarter (NW¼NW¼), Section 22, Township 23 South, Range 22 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northeast quarter (NE¼NE¼), Section 11, Township 21 South, Range 21 East, and from a point within the Northeast quarter of the Northeast quarter (NE¼NE¼), Section 11, Township 21 South, Range 21 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northwest quarter (NE¼NW¼), Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona.

4. There shall be no impoundments of public waters nor interference within the natural flow of the San Pedro River.

5. There shall be no consumptive use of public waters other than is caused by natural habitat (flora and fauna).

6. There shall be no interference with nor detrimental effect upon prior vested water rights as a result of the permitted beneficial use of public water.

7. The date of priority of the appropriation is August 12, 1985.

8. The Permittee shall, commencing immediately, maintain or continue to maintain a record of the flow of the San Pedro River at the aforesaid streamflow gaging location. In order to become a candidate for certification, the Permittee must submit a minimum of 4 years of streamflow data, an analysis of the data, a completed Proof of Appropriation, and a completed Affidavit of Appropriator to the Department of Water Resources on or before February 17, 1996.

Dated this 17th day of February, 1992.

ARIZONA DEPARTMENT OF WATER RESOURCES

Herb Dishlip
Deputy Director
Water Management

FCSPRNCA0596

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
3707 N. 7TH STREET
P.O. BOX 16563
PHOENIX, ARIZONA 85011

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
4270 (932)

Mr. Joe B. Stuart
Manager
Surface Water Rights Division
Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

Dear Mr. Stuart:

We have received the draft permit for the San Pedro River instream flow, Application for Permit to Appropriate Public Water No. 33-90103.

After reviewing the draft, we confirm that it addresses all issues involved with the application and is correct in location, types and amounts of use.

Since the period of record for the application is long, we intend to seek the certificate for this appropriation immediately. We will file the necessary applications as soon as we receive the permit.

Thank you for the opportunity to review the draft permit. We look forward to receiving the final permit in the near future. If any further questions arise prior to issuing the permit, please contact Jim Renthal at 640-5512.

Sincerely,

John V. Stephenson
for Beaumont C. McClure
Deputy State Director
Lands and Renewable Resources

FEB 24 1992

FCSPRNCA0597

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
SAFFORD DISTRICT OFFICE
425 E. 4TH STREET
SAFFORD, ARIZONA 85546

(602) 428-4040

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

7250
(043)

Febraury 19, 1992

Mr. Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

Dear Mr. Stuart:

In a letter dated February 4, 1992, you stated that your office was ready to issue a permit for the San Pedro River, within the San Pedro Riparian Conservation Area. The permit number is 33-90103.0001.

Please charge the required fee payment, a total of $50.00, to our fee credit account, FCA-3.

Please direct any communication on this matter to Del Molitor, District Hydrologist.

Sincerely,

for Ray A. Brady
District Manager

FEB 21 1992

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
PHOENIX FIELD OFFICE
One Renaissance Square
Two North Central Avenue
Suite 500
Phoenix, Arizona 85004

COMM. (602) 379-4756
(602) 379-4127
FTS: 261-4756
FAX: 261-4127

RECEIVED
FEB 14 1992
DEPARTMENT OF WATER

BLM.PX.2500

February 13, 1992

Mr. Herb Dishlip
Assistant Director
Department of Water Resources
15 South 15th Avenue
Phoenix, AZ 85007

Re: San Pedro River application to appropriate water submitted by the Bureau of Land Management; Application No. 33-90103

Dear Mr. Dishlip:

This letter concerns the above-referenced water right application submitted by the Bureau of Land Management (BLM) and now pending at the Department of Water Resources (DWR). Our specific concern relates to the protests which have been filed against this application.

Two protests have been filed by the Tenneco West Co. and the City of Sierra Vista. The question to be addressed by DWR is whether these protests appropriately raise any of the three valid points of protest set forth in 45 A.R.S. § 153: 1) does the application interfere with vested water rights, 2) does the application pose a problem with public safety, or 3) is the application consistent with the public interest? Our position is that the two protests do not raise any of these points, and therefore the protests should be disregarded by DWR.

As we understand the matter, Tenneco West has now transferred most of its land and water rights claims to the BLM, and all that is left, in regard to water entitlements, are groundwater wells. Since the BLM application is for a surface water right, whatever groundwater rights Tenneco may retain do not suffice to support an objection based on the interference with vested rights. Consequently, the Tenneco West protest is not valid and should be disregarded by DWR.

The City of Sierra Vista's protest is a bit vague and therefore a little more difficult to respond to. In order to attempt to come within statutory point no. 1 (vested rights), the City's protest letter suggests that DWR should determine whether the BLM application actually presents a conflict with the City's

FCSPRNCA0599

pre-existing applications. For the following reasons, we submit that the City's protest is inadequate.

First, it is not sufficient to ask DWR to determine whether there is a conflict with vested rights. We believe that a protestant can only comply with the statute by articulating points of conflict and providing facts to support such conclusions. Here the City has not done that, and the City's "maybe yes -- maybe no" protest is unacceptable.

Second, the City's pre-existing applications apparently involve intermittent tributaries in the vicinity of the City. Thus, the City's applications do not directly connect to the BLM's application for a constant flow right on the main stem of the San Pedro. Without a perennial flow connection between the applications, we submit that DWR may process the City's applications separately from BLM's applications without any finding of a potential conflict.

Finally, the BLM application is for a non-consumptive use entitlement based on existing stream flow. As a result of senior entitlements downstream on the San Pedro, we have to assume that the City's applications were not intended to impact the present-day normal flow of the San Pedro River. If that is the case, the BLM's non-consumptive use entitlement should not have any direct connection to the City's plans, assuming that the City's applications will eventually be granted.

For all of these reasons, we sincerely believe that there is no conflict between the BLM and City applications. In the absence of a conflict, the City's protest letter should be disregarded.

As we have said in the past, we hope to have permits on the BLM non-consumptive use applications within the San Pedro watershed in time to seek court approval for the amendment of our claims before May of 1992. Whatever you can do to move the BLM applications to the permit stage would be greatly appreciated.

Thank you for your attention to this matter.

Sincerely,

Fritz L. Goreham
Field Solicitor

William H. Swan
For the Field Solicitor

WHS:mo

FCSPRNCA0600

cc: Mark Sifferman, Attorney for Tenneco West
George P. Michael, Sierra Vista
Jim Renthal, BLM State Office
Ray Brady, BLM Safford District
Andy Laurenzi, Nature Conservancy, Tucson

FCSPRNCA0601

ARIZONA DEPARTMENT OF WATER RESOURCES
15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

February 6, 1992

FIFE SYMINGTON
Governor
ELIZABETH ANN RIEKE
Director

John F. Molloy
Molloy, Jones, Donahue, Trachta, Childers, & Mallamo, P.C.
P. O. Box 2268
Tucson, Arizona 85702

RE: Application for Permit to Appropriate Public Water, No. 33-90103, San Pedro Riparian National Conservation Area, Instream-Minimum-Flow Appropriation, United States Department of the Interior, Bureau of Land Management

Dear Mr. Molloy:

The referenced application to appropriate surface water was originally filed by a group of private conservation organizations with the Department of Water Resources on August 12, 1985, and subsequently acquired by the Bureau of Land Management. This application was protested by you, representing Tenneco West Company, soon after the public notice of the proposed appropriation was issued.

By evidence contained in the official record, as of this date, your protest against the proposed appropriation has not been withdrawn.

The proposed appropriation involves a request to acquire at water right for a minimum flow in the San Pedro River along a reach through the Bureau of Land Management's San Pedro National Conservation Area. As support for their application, the Bureau has presented evidence to the Department, required under guidelines established by the Department, as to the minimum amount of flow of the San Pedro River required for the purposes stated in the application to appropriate.

The Department has carefully reviewed the evidence presented by you and by the Bureau of Land Management. Based on that review we have determined that the application meets the requirements of A.R.S. § 45-151 et seq. As such, the Department of Water Resources will be issuing a Permit to Appropriate Public Water to the Bureau of Land Management.

Sincerely,

Herb Dishlip
Deputy Director

HD/jlc

FCSPRNCA0602

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

February 4, 1992

Bureau of Land Management
Attn: Del Molitor
425 East 4th Street,
Safford, Arizona 85546

Dear Mr. Molitor:

The Department of Water Resources is prepared to issue a permit for the following application:

33-90103.0000, for the San Pedro Riparian Conservation Area.

Upon receipt of the required fee payment, the Department will issue the permit. Please remit a check in the amount of $50.00 made payable to the Department of Water Resources.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:pr

FCSPRNCA0603

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

January 22, 1992

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

Mr. Jim Renthal
San Pedro Riparian National Conservation Area
Bureau of Land Management
Rural Route 1, Box 9853
Huachuca City, Arizona 85616

Re: Application for Permit to Appropriate Public
Water No. 33-90103

Dear Mr. Renthal:

The Department of Water Resources is prepared to issue a permit for the referenced application, involving an instream-flow appropriation along the San Pedro River.

Enclosed is a draft of the permit to be issued. Mr. Herb Dishlip, Deputy Director for Water Management, has asked that I forward you this draft for your review and confirmation.

Please review the draft permit. Please respond with your confirmation that the draft permit addresses all issues involved with the referenced application.

If you have any questions regarding this permit, please contact me.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Section
Operations Division
Telephone (602) 542-1581

JBS:asm

Enclosure

FCSPRNCA0604

Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

PERMIT TO APPROPRIATE PUBLIC WATER OF THE STATE OF ARIZONA

DRAFT

Application No. 33-90103.0001
Permit No. 33-90103.0000

This is to certify that pursuant to the provisions of Arizona Revised Statute 45-153, the United States Department of the Interior, Bureau of Land Managment, Arizona State Office, 3707 North 7th Street, Phoenix, Arizona, is granted an appropriative permit subject to the following terms:

1. Source: The public waters flowing in the San Pedro River.

2. Types of use, and amounts: Recreation and wildlife, including fish. The cumulative amount of use for both types of uses is expressed as an annual volume of flow of the San Pedro River as gaged at the beginning of the specific reaches described in item 3. The appropriated flow is further described as a median flow by month as gaged at the beginning of the reach near Palominas at the United States Geological Survey streamflow gage #94705 and at the beginning of the reach near Charleston at streamflow gage #94710. The flow rate appropriated, and cumulative total, is as follows:

	Flow Rate (cubic-feet/second)	
Month	Palominas Gage	Charleston Gage
October	3.7	12.2
November	3.6	13.6
December	5.5	17.1
January	7.9	19.5
February	8.6	20.3
March	6.3	18.9
April	2.5	12.2
May	1.2	7.9
June	0.6	4.2
July	7.0	19.0
August	7.0	19.0
September	7.0	19.0
Volume (acre-feet/year)	3,666	11,028

DRAFT

3. Points of diversion and places of use: Water will not be diverted from the natural channel. The beneficial use will occur instream along the meandering course of the San Pedro river. The instream use will start at a point within the Northwest quarter of the Northwest quarter (NW1/4NW1/4), Section 22, Township 23 South, Range 22 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northeast quarter, Section 11, Township 21 South, Range 21 East, and from a point within the Northeast quarter of the Northeast quarter, Section 11, Township 21 South, Range 21 East, continuing downstream along the main stem of the San Pedro River, to a point within the Northeast quarter of the Northwest quarter, Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona.

FCSPRNCA0605

4. There shall be no impoundments of public waters nor interference with the natural flow of the San Pedro River.

5. There shall be no consumptive use of public waters other than is caused by the natural habitat (flora and fauna).

6. There shall be no degradation of water quality by reason of the Permittee's appropriation of these public waters other than as caused by the natural habitat.

7. There shall be no interference with nor detrimental effect upon prior vested water rights as a result of the permitted beneficial use of public water.

8. The date of priority of this permit is August 12, 1985.

9. The Permittee shall, commencing immediately, maintain or continue to maintain a record of the flow of the San Pedro River at the aforesaid streamflow gaging locations. In order to become a candidate for certification, the Permittee must submit a minimum of 4 years of streamflow data, an analysis of the data, a completed Proof of Appropriation, and a completed Affidavit of Appropriator to the Department of Water Resources on or before _____, 1996.

Dated this ___ day of _____, 1992

_____
Herb Dishlip
Deputy Director
Water Management

DRAFT

DRAFT

FCSPRNCA0606

ARIZONA DEPARTMENT OF WATER RESOURCES
HYDROLOGY DIVISION

M E M O R A N D U M

TO: Joe Stuart, Operations Division

THRU: Greg Bushner, Section Manager, Surface Water/Recharge

FROM: Tom Harbour, Hydrology Division

DATE: October 28, 1991

RE: Hydrologic Review of the BLM Instream Flow Application No. 33-90103 for the San Pedro Riparian National Conservation Area

Recommendation

Hydrology is recommending approval of the referenced instream flow application based on availability of long term stream gage records, and the BLM's request for average median daily flows. The applicant has submitted sufficient data to adequately assess the historic availability of streamflow and the water requirements of the claimed beneficial uses. The requested flows do not appear to be excessive for the stated beneficial uses. Recommended beneficial uses and flow amounts are as follows:

Uses and Amounts

Uses: Wildlife, including fish

Recreation, including aesthetics

FCSPRNCA0607

Amounts:

Month	Flow Rate (cfs)	
	Palominas Gage #094705.0	Charleston Gage #094710.0
October	3.7	12.2
November	3.6	13.6
December	5.5	17.1
January	7.9	19.5
February	8.6	20.3
March	6.3	18.9
April	2.5	12.2
May	1.2	7.9
June	0.6	4.2
July	7.0	19.0
August	7.0	19.0
September	7.0	19.0
Volume (AC-ft/yr)	3,666	11,028

The only remaining obstacles appear to be the protests filed by Tenneco West and the City of Sierra Vista which have not been resolved; a hearing may be required to resolve this conflict.

jw

cc: Herb Dishlip
Greg Wallace

FCSPRNCA0608

United States Department of the Interior

San Pedro Riparian
National Conservation Area

Bureau of Land Management
Rural Route 1, Box 9853
Huachuca City, AZ 85616
602/457-2265

Tom Harbour, Hydrologist
Surface Water/Recharge Section
Arizona Department of Water Resources
15 S. 15th Ave.
Phoenix, Arizona 85007

October 10, 1991

Dear Tom:

I am responding to your letter of August 10, 1991 addressed to Mr. Lester K. Rosenkrance. The information you requested in that letter has been compiled by the San Pedro BLM recreation and wildlife staff and is enclosed herewith.

We hope that this greater level of detail allows you to proceed with the permitting process for our instream flow application #33-90103.

The BLM is mandated to protect, maintain, and enhance all existing riparian (water-dependent) values, including wildlife and recreation.

The San Pedro Riparian National Conservation Area (NCA) is managed for enhancement of wildlife habitat. Plans to enhance public recreation potential through development of various interpretation opportunities and facilities are also being formulated.

These claimed beneficial uses are indeed very crucial to the BLM's mission in the San Pedro and will continue to be developed and monitored in the future. As such, more information will be compiled for each use, but for now this is the best available information.

Please do not hesitate to contact me at 457-2265 if you have any questions.

Sincerely;

Ben Lomeli,
Hydrologist

cc: Jim Renthal, ASO

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OCT 15 1991
HYDROLOGY DIV.

WILDLIFE BENEFICIAL USES CLAIMED

Wildlife - Introduction

The wildlife section consists of three parts: birds, mammals, and reptiles/ amphibians. Each part consists of a brief summary of inventory and monitoring efforts and a species list categorizing each species as riparian obligate, riparian associate, or non-riparian (the term "facultative" is synonymous with "associate" and commonly used in reference to bird species). These lists adequately document that the majority of wildlife species depend, to greater or lesser extent, upon the presence of a healthy riparian ecosystem.

Most of our future monitoring efforts will concentrate upon bird species for the following reasons.

1) Birds as a group are regarded as more sensitive than other taxa to changes in riparian habitat.
2) More bird species are listed as threatened or endangered (either by the U. S. Fish and Wildlife Service or the Arizona Game and Fish Department) or are candidates for listing.
3) Birds are the focus of widespread public interest and attention, particularly in southeastern Arizona.

The San Pedro Riparian National Conservation Area initiated an intensive avian inventory in May, 1986 to determine the number and status of the bird species which occur within the NCA. The initial monitoring program was completed after 5 continuous years of transect readings, and the Final Report is currently being prepared. Based on the findings of this monitoring effort, habitat management recommendations will be made for all future land use decisions. It is anticipated that the avian monitoring effort will resume with the publication of the Final Report and will continue for as long as deemed necessary to determine the avian dynamics within the NCA. With historical records included, there have been 377 species of birds recorded within the Upper San Pedro River Valley. This total represents over one-half of the bird species which occur in North America. While many of the recorded species are strictly migrants, the impressive total illustrates the extreme value of the riparian ecosystem within the San Pedro River Valley.

BIRDS OF THE SAN PEDRO RIPARIAN
NATIONAL CONSERVATION AREA

The following avian checklist documents all species of birds which have been recorded within the Upper San Pedro River Valley from historic times through July, 1991. Following the species are columns which indicate the habitat requirements of each:

1) Riparian Obligate (biologically essential for survival)

2) Riparian Facultative (riparian use not essential for survival, but provides needed options for survival)

3) Non-riparian dependent (utilizes other habitats)

	1	2	3
LOONS AND GREBES			
___ Pacific Loon	X		
___ Least Grebe	X		
___ Pied-billed Grebe	X		
___ Eared Grebe	X		
___ Western Grebe	X		
___ Clark's Grebe	X		
CORMORANTS AND PELICANS			
___ American White Pelican	X		
___ Brown Pelican	X		
___ Double-crested Cormorant	X		
___ Olivaceous Cormorant	X		
___ Magnificent Frigatebird	X		
HERONS AND ALLIES			
___ American Bittern	X		
___ Least Bittern	X		
___ Great Blue Heron	X		
___ Great Egret	X		
___ Snowy Egret	X		
___ Little Blue Heron	X		
___ Tricolored Heron	X		
___ Cattle Egret	X		
___ Green-backed Heron	X		
___ Black-crowned Night-Heron	X		
___ White-faced Ibis	X		
___ Wood Stork	X		

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	1	2	3
SWANS, GEESE AND DUCKS			
___ Black-bellied Whistling Duck	X		
___ Tundra Swan	X		
___ Greater White-fronted Goose	X		
___ Snow Goose	X		
___ Ross' Goose	X		
___ Canada Goose	X		
___ Wood Duck	X		
___ Green-winged Teal	X		
___ Mallard	X		
___ Northern Pintail	X		
___ Blue-winged Teal	X		
___ Garganey	X		
___ Cinnamon Teal	X		
___ Northern Shoveler	X		
___ Gadwall	X		
___ American Wigeon	X		
___ Canvasback	X		
___ Redhead	X		
___ Ring-necked Duck	X		
___ Greater Scaup	X		
___ Lesser Scaup	X		
___ Surf Scoter	X		
___ Common Goldeneye	X		
___ Bufflehead	X		
___ Hooded Merganser	X		
___ Common Merganser	X		
___ Red-breasted Merganser	X		
___ Ruddy Duck	X		
RAPTORS			
___ Black Vulture		X	
___ Turkey Vulture		X	
___ Osprey	X		
___ Black-shouldered Kite		X	
___ Mississippi Kite	X		
___ Bald Eagle	X		
___ Northern Harrier			X
___ Sharp-shinned Hawk		X	
___ Cooper's Hawk		X	
___ Northern Goshawk		X	
___ Common Black Hawk	X		
___ Great Black Hawk	X		
___ Harris' Hawk		X	
___ Gray Hawk	X		
___ Broad-winged Hawk		X	
___ Swainson's Hawk		X	
___ White-tailed Hawk		X	
___ Zone-tailed Hawk	X		
___ Red-tailed Hawk		X	
___ Ferruginous Hawk		X	
___ Rough-legged Hawk		X	
___ Golden Eagle		X	

	1	2	3
___ Crested Caracara			X
___ American Kestrel		X	
___ Merlin		X	
___ Peregrine Falcon		X	
___ Aplomado Falcon		X	
___ Prairie Falcon		X	
QUAIL AND ALLIES			
___ Wild Turkey		X	
___ Montezuma Quail		X	
___ Scaled Quail		X	
___ Gambel's Quail			
RAILS AND ALLIES			
___ Black Rail	X		
___ Virginia Rail	X		
___ Sora	X		
___ Purple Gallinule	X		
___ Common Moorhen	X		
___ American Coot	X		
___ Sandhill Crane		X	
SHOREBIRDS			
___ Black-bellied Plover	X		
___ Snowy Plover	X		
___ Semipalmated Plover	X		
___ Killdeer	X		
___ Black-necked Stilt	X		
___ American Avocet	X		
___ Greater Yellowlegs	X		
___ Lesser Yellowlegs	X		
___ Solitary Sandpiper	X		
___ Willet	X		
___ Spotted Sandpiper	X		
___ Whimbrel	X		
___ Long-billed Curlew		X	
___ Marbled Godwit	X		
___ Ruddy Turnstone	X		
___ Sanderling	X		
___ Semipalmated Sandpiper	X		
___ Western Sandpiper	X		
___ Least Sandpiper	X		
___ Baird's Sandpiper	X		
___ Pectoral Sandpiper	X		
___ Dunlin	X		
___ Stilt Sandpiper	X		
___ Short-billed Dowitcher	X		
___ Long-billed Dowitcher	X		
___ Common Snipe	X		
___ Wilson's Phalarope	X		
___ Red-necked Phalarope	X		
___ Red Phalarope	X		

	1	2	3
GULLS AND TERNS			
___ Long-tailed Jaeger	X		
___ Franklin's Gull	X		
___ Bonaparte's Gull	X		
___ Heermann's Gull	X		
___ Ring-billed Gull	X		
___ California Gull	X		
___ Herring Gull	X		
___ Black-legged Kittiwake	X		
___ Common Tern	X		
___ Forster's Tern	X		
___ Least Tern	X		
___ Black Tern	X		
PIGEONS AND DOVES			
___ Rock Dove			X
___ Band-tailed Pigeon		X	
___ White-winged Dove		X	
___ Mourning Dove		X	
___ Inca Dove		X	
___ Common Ground-Dove		X	
___ Ruddy Ground-Dove		X	
CUCKOOS AND ALLIES			
___ Yellow-billed Cuckoo	X		
___ Greater Roadrunner			X
___ Groove-billed Ani		X	
ØWLS			
___ Common Barn-Owl		X	
___ Flammulated Owl		X	
___ Western Screech-Owl		X	
___ Great Horned-Owl		X	
___ Elf Owl		X	
___ Burrowing Owl			X
___ Long-eared Owl		X	
___ Short-eared Owl		X	
GOATSUCKERS			
___ Lesser Nighthawk		X	
___ Common Nighthawk		X	
___ Common Poorwell			X
___ Whip-poor-will		X	
SWIFTS			
___ Black Swift			X
___ Chimney Swift			X
___ Vaux's Swift			X
___ White-throated Swift			X
HUMMINGBIRDS			
___ Broad-billed Hummingbird		X	

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	1	2	3
___ Violet-crowned Hummingbird		X	
___ Plain-capped Starthroat		X	
___ Black-chinned Hummingbird		X	
___ Anna's Hummingbird		X	
___ Costa's Hummingbird			X
___ Calliope Hummingbird		X	
___ Broad-tailed Hummingbird		X	
___ Rufous Hummingbird		X	
___ Allen's Hummingbird		X	
TROGONS AND KINGFISHERS			
___ Elegant Trogon	X		
___ Belted Kingfisher	X		
___ Green Kingfisher	X		
WOODPECKERS			
___ Lewis' Woodpecker		X	
___ Acorn Woodpecker		X	
___ Gila Woodpecker		X	
___ Yellow-bellied Sapsucker		X	
___ Red-naped Sapsucker		X	
___ Red-breasted Sapsucker		X	
___ Williamson's Sapsucker		X	
___ Ladder-backed Woodpecker		X	
___ Hairy Woodpecker		X	
___ Northern Flicker		X	
FLYCATCHERS			
___ Northern Beardless-Tyrannulet	X		
___ Olive-sided Flycatcher	X		
___ Greater Pewee		X	
___ Western Wood-Pewee	X		
___ Willow Flycatcher	X		
___ Least Flycatcher		X	
___ Hammond's Flycatcher		X	
___ Dusky Flycatcher		X	
___ Gray Flycatcher		X	
___ Pacific-Slope Flycatcher		X	
___ Buff-breasted Flycatcher		X	
___ Black Phoebe	X		
___ Eastern Phoebe	X		
___ Say's Phoebe		X	
___ Vermilion Flycatcher	X		
___ Dusky-capped Flycatcher	X		
___ Ash-throated Flycatcher		X	
___ Brown-crested Flycatcher	X		
___ Sulphur-bellied Flycatcher	X		
___ Tropical Kingbird	X		
___ Cassin's Kingbird		X	
___ Thick-billed Kingbird	X		
___ Western Kingbird		X	

	1	2	3
___ Eastern Kingbird		X	
___ Scissor-tailed Flycatcher		X	
BECARDS, LARKS AND SWALLOWS			
___ Rose-throated Becard	X		
___ Horned Lark			X
___ Purple Martin		X	
___ Tree Swallow		X	
___ Violet-green Swallow		X	
___ Northern Rough-winged Swallow		X	
___ Bank Swallow	X		
___ Cliff Swallow		X	
___ Barn Swallow		X	
JAYS, CROWS AND RAVENS			
___ Steller's Jay		X	
___ Blue Jay		X	
___ Scrub Jay			X
___ Gray-breasted Jay		X	
___ Pinyon Jay			X
___ Clark's Nutcracker		X	
___ American Crow		X	
___ Chihuahuan Raven		X	
___ Common Raven		X	
TITMICE, BUSHTITS AND WRENS			
___ Bridled Titmouse	X		
___ Verdin			X
___ Bushtit		X	
___ Red-breasted Nuthatch		X	
___ White-breasted Nuthatch		X	
___ Pygmy Nuthatch		X	
___ Brown Creeper		X	
___ Cactus Wren			X
___ Rock Wren			X
___ Canyon Wren		X	
___ Bewick's Wren		X	
___ House Wren		X	
___ Winter Wren	X		
___ Marsh Wren	X		
GNATCATCHERS, KINGLETS AND THRUSHES			
___ Golden-crowned Kinglet		X	
___ Ruby-crowned Kinglet		X	
___ Blue-gray Gnatcatcher		X	
___ Black-tailed Gnatcatcher		X	
___ Eastern Bluebird		X	
___ Western Bluebird		X	
___ Mountain Bluebird		X	
___ Townsend's Solitaire		X	
___ Veery	X		

FCSPRNCA0618

	1	2	3
___ Swainson's Thrush	X		
___ Hermit Thrush		X	
___ Rufous-backed Robin		X	
___ American Robin		X	
___ Varied Thrush		X	
MOCKINGBIRDS AND THRASHERS			
___ Gray Catbird			
___ Northern Mockingbird		X	
___ Sage Thrasher			X
___ Brown Thrasher		X	
___ Bendire's Thrasher			X
___ Curve-billed Thrasher			X
___ Crissal Thrasher		X	
PIPITS AND WAXWINGS			
___ American Pipit		X	
___ Sprague's Pipit		X	
___ Bohemian Waxwing		X	
___ Cedar Waxwing		X	
SILKY FLYCATCHERS AND SHRIKES			
___ Phainopepla			X
___ Northern Shrike		X	
___ Loggerhead Shrike		X	
STARLINGS			
___ European Starling		X	
VIREOS			
___ White-eyed Vireo		X	
___ Bell's Vireo	X		
___ Gray Vireo		X	
___ Solitary Vireo		X	
___ Hutton's Vireo		X	
___ Warbling Vireo		X	
___ Philadelphia Vireo		X	
___ Yellow-green Vireo	X		
WOOD WARBLERS			
___ Golden-winged Warbler		X	
___ Tennessee Warbler		X	
___ Orange-crowned Warbler		X	
___ Nashville Warbler		X	
___ Virginia's Warbler		X	
___ Lucy's Warbler		X	
___ Northern Parula		X	
___ Yellow Warbler	X		
___ Chestnut-sided Warbler		X	
___ Magnolia Warbler		X	
___ Cape May Warbler		X	
___ Black-throated Blue Warbler		X	

	1	2	3
___ Yellow-rumped Warbler		X	
___ Black-throated Gray Warbler		X	
___ Townsend's Warbler		X	
___ Hermit Warbler		X	
___ Black-throated Green Warbler		X	
___ Grace's Warbler		X	
___ Pine Warbler		X	
___ Palm Warbler	X		
___ Black and white Warbler		X	
___ American Redstart		X	
___ Prothonotary Warbler	X		
___ Worm-eating Warbler	X		
___ Ovenbird		X	
___ Northern Waterthrush	X		
___ Louisiana Waterthrush	X		
___ Kentucky Warbler		X	
___ Mourning Warbler		X	
___ MacGillivray's Warbler	X		
___ Common Yellowthroat	X		
___ Hooded Warbler	X		
___ Wilson's Warbler		X	
___ Red-faced Warbler		X	
___ Painted Redstart		X	
___ Yellow-breasted Chat	X		
TANAGERS			
___ Hepatic Tanager		X	
___ Summer Tanager	X		
___ Scarlet Tanager	X		
___ Western Tanager		X	
GROSBEAKS AND ALLIES			
___ Northern Cardinal		X	
___ Pyrrhuloxia		X	
___ Rose-breasted Grosbeak		X	
___ Black-headed Grosbeak		X	
___ Blue Grosbeak		X	
___ Lazuli Bunting		X	
___ Indigo Bunting		X	
___ Varied Bunting		X	
___ Painted Bunting		X	
___ Dickcissel			X
___ Green-tailed Towhee		X	
___ Rufous-sided Towhee		X	
___ Canyon Towhee		X	
___ Abert's Towhee	X		
___ Botteri's Sparrow			X
___ Cassin's Sparrow			X
___ Rufous-winged Sparrow			X
___ Rufous-crowned Sparrow			X
___ Chipping Sparrow		X	
___ Clay-colored Sparrow		X	

FCSPRNCA0620

	1	2	3
___ Brewer's Sparrow			X
___ Black-chinned Sparrow			X
___ Vesper Sparrow			X
___ Lark Bunting			X
___ Black-throated Sparrow			X
___ Sage Sparrow			X
___ Savannah Sparrow		X	
___ Baird's Sparrow			X
___ Grasshopper Sparrow			X
___ Fox Sparrow		X	
___ Song Sparrow	X		
___ Lincoln's Sparrow	X		
___ Swamp Sparrow	X		
___ White-throated Sparrow		X	
___ Golden-crowned Sparrow		X	
___ White-crowned Sparrow		X	
___ Harris' Sparrow		X	
___ Dark-eyed Junco		X	
___ Yellow-eyed Junco		X	
___ McCown's Longspur			X
___ Chestnut-collared Longspur			X
BLACKBIRDS AND ALLIES			
___ Bobolink			X
___ Red-winged Blackbird	X		
___ Eastern Meadowlark			X
___ Western Meadowlark			X
___ Yellow-headed Blackbird	X		
___ Rusty Blackbird	X		
___ Brewer's Blackbird	X		
___ Great-tailed Grackle		X	
___ Common Grackle		X	
___ Bronzed Cowbird		X	
___ Brown-headed Cowbird		X	
___ Orchard Oriole		X	
___ Hooded Oriole		X	
___ Northern Oriole		X	
___ Scott's Oriole		X	
FINCHES AND ALLIES			
___ Purple Finch		X	
___ Cassin's Finch		X	
___ House Finch		X	
___ Red Crossbill		X	
___ Pine Siskin		X	
___ Lesser Goldfinch		X	
___ Lawrence's Goldfinch		X	
___ American Goldfinch		X	
___ House Sparrow		X	
TOTALS	149	189	39

FCSPRNCA0621

Mammal Species

A final mammal inventory report has been prepared and will be published when funding becomes available. In this report population estimates for collared peccary and mule deer are presented; 253 maximum for peccary and 420 maximum for mule deer. Data for white-tailed deer is not available. Relative population densities are presented for desert shrew, twenty-two rodent species, and rabbits. For many mammal species only presence or absence data was available. The attached list is based on data from this report plus other sources.

Future habitat trends for riparian associated mammal species will be determined by changes in the quantity (or acreage) of cottonwood/willow habitat, flood-plain mesquite woodlands; and flood-plain sacaton grassland and quality of riparian habitats in terms of a variety of parameters including herbaceous plant cover, foliage density, plant species diversity, and tree canopy cover. These trends will be monitored using such techniques as color infra-red aerial photography, combined line/ point intercept transects, pace-frequency transects, foliage height diversity transects, and aspect photos.

If funding permits future monitoring of desert shrew and rodent populations will consist of re-sampling at the same locations as the original inventory to determine trends relative to changes in vegetation. A more detailed inventory of bats is also planned since Sanborn's long-nosed bat is listed as federal endangered species and several species are suspected of being threatened or endangered. Data from post hunt counts of deer and peccary (performed by Arizona Game and Fish Department) will be used to determine trend. For riparian associated species not thought to be threatened or endangered, for which no baseline population estimates are available, the assumption will be made that mammal populations will respond according to trends (positive or negative) in riparian quantity and quality.

FCSPRNCA0622

Mammals of the San Pedro Riparian National Conservation Area

The following is a list of all mammal species documented within the San Pedro Riparian National Conservation Area by our inventory, conducted from 1987 and 1988, or literature survey.

O = Riparian obligate species (species which depend upon riparian habitat for completion of their life cycles)

A = Riparian associated species (species whose survival is enhanced by the presence of riparian habitat in their home range)

N = Species not associated with riparian habitat

SHREWS		
Notiosorex crawfordi	Desert shrew	A
BATS		
Macrotus californicus	California leaf-nosed bat	N
Choeronycteris mexicana	Long-tongued bat	N
Leptonycteris sanborni	Sanborn's long-nosed bat	N
Myotis yumanensis	Yuma myotis	A
M. velifer	Cave myotis	A
M. auriculus	Southwestern myotis	A
M. thysanodes	Fringed myotis	A
M. volans	Long-legged myotis	N
M. californicus	California myotis	N
M. leibii	Small-footed myotis	N
Lasionycteris noctivagans	Silver-haired bat	A
Pipistrellus hesperus	Western pipistrelle	A
Eptesicus fuscus	Big brown bat	A
Lasiurus borealis	Red bat	A
L. ega	Southern yellow bat	A
L. cinereus	Hoary bat	A
Euderma maculatum	Spotted bat	A
Idionycteris phyllotis	Allen's lappet-browed bat	A
Plecotus townsendi	Townsend's big-eared bat	A
Antrozous pallidus	Pallid bat	A
Tadarida brasiliensis	American free-tailed bat	N
T. femorosacca	Pocketed free-tailed bat	N
T. macrotis	Big free-tailed bat	N
Eumops perotis	Western mastiff bat	N
CARNIVORES		
Ursus americanus	Black bear	A
Procyon lotor	Racoon	A
Nasua nasua	Coati	A
Bassariscus astutus	Ringtail	A

FCSPRNCA0623

Canis latrans	Coyote	N
Vulpes macrotis	Kit fox	N
Urocyon cinereoargenteus	Gray fox	A
Mustela frenata	Long-tailed weasel	A
Taxidea taxus	Badger	N
Spilogale gracilis	Spotted skunk	A
Mephitis mephitis	Striped skunk	A
M. macroura	Hooded skunk	A
Conepatus mesoleucus	Hog-nosed skunk	A
Felis concolor	Mountain lion	A
F. rufus	Bobcat	A
(extirpated carnivores)		
Ursus arctos	Grizzly bear	A
Felis onca	Jaguar	A
Canis lupis	Gray wolf	N
(exotic carnvores)		
Felis catus	Feral house cat	A
RODENTS		
Ammospermophilus harrisii	Harris' antelope squirrel	N
Spermophilus variegatus	Rock squirrel	A
S. spilosoma	Spotted ground squirrel	N
S. tereticaudus	Round-tailed ground squirrel	N
Thomomys bottae	Pocket gopher	A
Perognathus flavus	Silky pocket mouse	N
P. intermedius	Rock pocket mouse	N
P. penicillatus	Desert pocket mouse	N
P. baileyi	Bailey's pocket mouse	N
P. hispidus	Hispid pocket mouse	N
Dipodomys ordii	Ord's kangaroo rat	N
D. spectabilis	Banner-tailed kangaroo rat	N
D. merriami	Merriam's kangaroo rat	N
Reithrodontomys montanus	Plains harvest mouse	N
R. megalotis	Western harvest mouse	A
R. fulvescens	Fulvous harvest mouse	A
Peromyscus eremicus	Cactus mouse	A
P. maniculatus	Deer mouse	N
P. leucopus	White-footed mouse	A
P. boylii	Brush mouse	N
Baiomys taylori	Northern pygmy mouse	N
Onychomys leucogaster	Northern grasshopper mouse	N
O. torridus	Southern grasshopper mouse	A
Sigmodon arizonae	Arizona cotton rat	N
S. fulviventer	Fulvous cotton rat	N
S. ochrognathus	Yellow-nosed cotton rat	N
Neotoma albigula	White-throated wood rat	N
Mus musculus	House mouse	N
Erithizon dorsatum	Porcupine	A
(extirpated rodents)		
Castor canadensis	Beaver	O
Ondatra zibethicus	Muskrat	O

FCSPRNCA0624

RABBITS

Lepus alleni	antelope jack rabbit	N
Lepus californicus	black-tailed jack rabbit	N
Sylvilagus audubonii	desert cottontail	A

PECCARY

Tayassu tajacu	Collared peccary	A

DEER

Odocoileus hemionus	Mule deer	A
Odocoileus virginianus	White-tailed deer	A

ANTILOCAPRIDS

Antilocapra americana	Pronghorn	N

42 Riparian associates

38 Species not associated with riparian habitat

2 Riparian obligates (extripated)

Reptiles and amphibians

A final reptile and amphibian inventory report has been prepared and will be published when funding becomes available. In this report relative population densities (in terms of captures per trap night) are presented for ten common reptile species. Due to their secretive habits only presence or absence could be determined for many species. The attached list is based on data from this report plus other sources.

As with mammals habitat trends for riparian obligate and associated reptile and amphibian species will be determined by changes in the quantity (or acreage) of aquatic habitats (marsh-lands and riverine), cottonwood/willow habitat, flood-plain mesquite woodlands; and flood-plain sacaton grassland and quality of riparian habitats in terms of a variety of parameters including herbaceous plant cover, foliage density, plant species diversity, and tree canopy cover. These trends will be monitored using such techniques as color infra-red aerial photography, combined line/ point intercept transects, pace-frequency transects, foliage height diversity transects, and aspect photos. We will rely heavily upon the water-shed program to gather data on water quality and stream flow regimes.

If funding permits future monitoring of reptile populations will consist of re-sampling (using pit-fall trapping techniques) at the same locations as the original inventory to determine trends relative to changes in vegetation. A more intensive inventory of Mexican garter snake is also planned since it is suspected of being threatened or endangered. For riparian associated species not thought to be threatened or endangered, for which no baseline population data are available, the assumption will be made that populations will respond according to trends (positive or negative) in riparian quantity and quality.

FCSPRNCA0626

Reptiles and Amphibians
of
the San Pedro Riparian
National Conservation Area

The following is a list of all reptiles and amphibian species documented within the conservation area either through our own inventory performed by Troy Corman from 1986 through 1988 or species which could be expected based on literature survey.

Attached is a paper by Howard Lawler which explains the terms Riparian Obligate and Riparian Associates relative to reptiles and amphibians.

O = Riparian obligate species

A = Riparian associate species

N = Species not associated with Riparian habitats

SPECIES	
Couch's Spadefoot	A
Southern Spadefoot	A
Sonoran Desert Toad	A
Southwestern Woodhouse's Toad	A
Red-spotted Toad	A
Great Plains Toad	A
Bullfrog	O
Sonoran Mud Turtle	A
Desert Box Turtle	A
Texas Spiny Softshell	O
Tucson Banded Gecko	A
Southwestern Earless Lizard	A
Common Zebra-tailed Lizard	N
Large-spotted Leopard Lizard	N
Twin-spotted Spiny Lizard	A
Clark's Spiny Lizard	A
Southern Prairie Lizard	A
Tree Lizard	A
Texas Horned Lizard	N
Regal Horned Lizard	N
Giant Spotted Whiptail	A
Desert Grassland Whiptail	A
Sonoran Spotted Whiptail	A
Arizona Desert Whiptail	N
Madrean Alligator Lizard	A
Reticulate Gila Monster	N

FCSPRNCA0627

REPTILES AND AMPHIBIAN SPECIES CONTINUED

Texas Blind Snake	N
Regal Ringneck Snake	A
Mexican Hognose Snake	A
Coachwhip	N
Sonoran Mountain Whipsnake	A
Big Bend Patch-nosed Snake	N
Sonoran Gopher Snake	N
Desert Kingsnake	A
Western Long-nosed Snake	N
Northern Mexican Garter Snake	O
Checkered Garter Snake	A
Southwestern Black-headed Snake	A
Night Snake	A
Sonoran Lyre Snake	N
Arizona Coral Snake	A
Western Diamondback Rattlesnake	A
Mojave Green Rattlesnake	N

3 Riparian Obligate Species

26 Riparian Associated Species

14 Species not associated with riparian habitats

Riparian Herpetofauna in the Sonoran Desert

Howard Lawler
Curator of Reptiles, Amphibians, Fishes and Invertebrates
Arizona-Sonora Desert Museum

The moist, more densely vegetated riparian zones provide avenues of dispersal and havens of habitat for species which require cooler, wetter conditions for survival. In the Southwest, many of these species are declining as their critical habitats are compromised in quantity and quality.

It is important to our understanding of the current riparian dilemma to separate those species which depend entirely upon such habitats for their existence (riparian obigates) from those which utilize them opportunistically or preferentially but which can survive in other habitats as well (riparian associates).

In the Sonoran Desert region, riparian obligates are generally derived from temperate or tropical climates with greater moisture, arriving here either through dispersal along drainage channels or remaining as relictal populations from a time when the climate was cooler and moister than it is today.

Nine species of herpetozoans included in Threatened Native Wildlife in Arizona (1988), by Arizona Game and Fish Department, are clearly riparian obligates and five others are strongly associated with, and probably dependent upon these habitats. Together, these comprise nearly 61% of the herps thought to be in need of special conservation management in Arizona. When we consider these and other animals which depend on wetland habitats, it is clear that an important part of Arizona's remarkable wildlife diversity is in danger of being lost forever if remaining riparian ecosystems are not preserved.

Forty-six species of amphibians occur in Arizona, Sonora and Baja California. Of these, most are frogs, toads and spadefoots. Toads and spadefoots have adapted marvelously to the rigors of life in the desert, primarily due to their burrowing ability and highly seasonal and environmentally-cued reproductive cycles. While in the broadest sense, they are riparian species, most have the advantage of being able to reproduce in temporary or seasonal water, making them less vulnerable to dramatic changes in perennial aquatic habitats. Two toads, the Southwestern Woodhouse Toad (*Bufo woodhousei*) and the Southwestern Toad (*Bufo microscaphus*), have a greater affinity for riparian ecosystems at lower elevational limits of their range. Both are commonly associated with arroyos, washes and streams which offer greater moisture than the surrounding environments.

Dry washes and arroyos form xero-riparian habitat in areas where they cut through extremely dry, sparsely vegetated desert. Here, one may find greater densities of Desert Spadefoot Toad (*Scaphiopus couchi*), Red-spotted Toad (*Bufo punctatus*), Great Plains Toad (*Bufo cognatus*), Sonoran Desert Toad (*Bufo alvarius*), Tree Lizard (*Urosaurus ornatus*) and Side-blotched Lizard (*Uta stansburiana*). These and other desert reptiles and amphibians not normally associated with riparian habitats are often more numerous here, where more plant growth and moister soils provide critical cover, food and amelioration of environmental extremes.

The true frogs (Family Ranidae), on the other hand, are confined to the damp, often cooler habitats near perpetual water where they remain active throughout much of the year. Their relatively smooth, moist skins are continually refreshed by frequent dousings in the nearby waters. Frogs, with their permeable skins, are particularly vulnerable to natural or human-imposed processes which reduce or eliminate water and essential plant cover or which introduce pollutants or exotic species. They may be important biological indicators of environmental quality in aquatic/riparian ecosystems. As the frogs decline, so do those predators which depend upon them wholly or in part.

The Tarahumara Frog (*Rana tarahumarae*) inhabits permanent streams in mountains associated with the great Sierra Madre Occidental of western Mexico. It occurs in considerable numbers where it is undisturbed, and was once common at the six known localities in the Pajarito and Santa Rita Mountains of Santa Cruz County, Arizona. In the late 1970's a mysterious and sharp crash occurred in these populations; today the species is considered extinct in Arizona. Some populations in northern Sonora have shown similar die-offs, although Mexican populations south of the borderlands appear to be doing well. What caused this fatal decline in so short a time is still unclear, but evidence points to a pollution factor relating to trace minerals or acid rain, probably originating with sulfur dioxide emissions from U.S. and Mexican copper smelters in the region.

The leopard frogs comprise a species complex formerly considered to be a single species. Studies have shown that several distinctive species exist and often occur together without interbreeding. Each of these species is specifically adapted to particular variations of riparian habitat even though they differ little in general appearance. Five species of leopard frogs occur in Arizona and two more in Sonora. Two, the Plains Leopard Frog (*Rana blairi*) and the Relict Leopard Frog (*Rana onca*), are considered endangered in Arizona; the latter may already be extinct in the state and is federally listed as Endangered. Accelerated loss of wetland habitats and the introduction of the non-native Bullfrog (*Rana catesbeiana*) have sharply reduced populations of these formerly common frogs. Other leopard frogs are similarly threatened but to lesser degrees. The Bullfrog, a highly adaptable species, is well established throughout most of southern Arizona where permanent water exists. It has been implicated in the decline or disappearance of populations of native frogs, snakes and other riparian vertebrates due to its large size and voracious appetite for anything that moves.

In 1987, the Arizona Game and Fish Department rescinded bag limits and closed seasons on the taking of bullfrogs (except in counties along the Colorado River below Lake Mead) where it competes with and preys upon native wildlife. This will allow interested individuals, agencies, and organizations to put more pressure on the Bullfrog.

A high percentage of the Mexican Garter Snakes (*Thamnophis eques*) at San Bernardino National Wildlife Refuge, east of Douglas, Arizona, have damaged or incomplete tails. Baby and juvenile garter snakes are abnormally scarce. The never-satiated Bullfrog is suspected to be responsible. Several populations of this garter snake, whose U.S. distribution is almost entirely limited to southern and Central Arizona, have been extirpated and others are in decline from habitat loss and degradation and predation.

Other garter snakes in Arizona are suffering similar declines for a variety of reasons. Some populations of the Checkered Garter Snake (*Thamnophis marcianus*) have experienced localized extinction due to urban encroachment and loss of riparian habitat. This species and the Black-necked Garter Snake (*Thamnophis cyrtopsis*) share typical garter snake characteristics; three body stripes on a green or olive drab background. The Checkered Garter has prominent black spots scattered through the lighter ground color. Both

FCSPRNCA0629

feed on fish, amphibians, invertebrates, and occasionally lizards and rodents.

The strange looking Narrow-headed Garter Snake (*Thamnophis rufipunctatus*), a specialized fish and amphibian eater, is limited in Arizona to permanent streams like Oak Creek Canyon draining from the Mogollon Rim. This highly aquatic species, rarely found far from permanent water, is more similar in appearance and habits to the closely related water snakes than to other garter snakes. In fact it has been classified as such in the past. It is becoming rare in some areas, probably due to habitat modification and introduction of predatory game fishes. Healthy populations still occur along Oak Creek above Sedona, and along the Black and Blue Rivers further to the east.

One lizard taxon is apparently endemic to riparian habitats in Arizona. The Arizona Skink, *Eumeces gilberti arizonensis*, is recorded only from along the Hassayampa River and its tributaries. It is found in brush piles, leaflitter and other debris deposited during periods of flooding. It is counsidered to be endangered by water deversion and other flood control measures. Interesting, the Greater Earless Lizard, *Cophosaurus texana*, is also largely restricted to the riparian community in this drainage. Elsewhere, it occupies a variety of microhabitats.

Turtles are usually associated with aquatic/riparian habitats. However, in Arizona only two of the four native species are typically found in riparian zones. The Sonoran Mud Turtle (*Kinosternon sonorense*) is found over much of central and southern Arizona, with isolated populations in the western portion of the state where suitable habitat exists. It is more often found in upland habitats with flowing water than its relative, the Yellow Mud Turtle (*Kinosternon flavescens*). The latter has a more limited distribution in Arizona where it occupies ponds, tanques and other standing water with muddy or sandy bottoms. A recent survey of its status in Arizona and north-central Sonora by Dr. John Iverson, indicates that populations are healthier and more numerous than previously thought. This information resulted in its removal from the State's list of protected reptiles. While some of its natural habitat is disappearing due to groundwater pumpdown and encroachment, man-made ponds and tanques are increasing. This may ameliorate some of the human impact on this species. Both native mud turtles are very aquatic and rarely found far from permanent water. They feed on invertebrates, amphibians, carrion and aquatic plants.

Sliders (*Trachemys scripta* ssp.) are hard-shelled aquatic turtles which have been introduced into some riparian/aquatic habitats in Arizona. The Red-eared Slider (*Trachemys scripta elegans*), long common in the pet trade, is the most frequently encountered introducee. They may be found in streams, ponds, or lakes which harbor sufficient invertebrates, fish, tadpoles and aquatic plants to sustain them. Two native subspecies occur in Sonora, the Rio Yaqui Slider (*Trachemys scripta yaquia*) and the Rio Fuerte Slider (*Trachemys scripta hiltoni*). Both are essentially river turtles which require sandy banks for nesting sites. There is some indication that the Rio Yaqui Slider may not be reproducing sufficiently to sustain populations in some portions of its range. This may be a result of fewer suitable nesting sites due to the lack of flooding caused by dams in the region.

The Texas Spiny Softshell (*Trionyx spiniferus*) is an introduced species which is well established in permanent waters over much of Arizona. It is highly aquatic, often exposing only the snorkle-like tip of the nose as it floats beneath the surface. Agile in the water and on land, it feeds mainly on aquatic invertebrates, small vertebrates and occasionally plant material. Large females can produce up to two large clutches of eggs per year.

Natural and unaltered bodies of water, whether free-flowing or standing, are increasingly scarce. This is due to many factors: lowering of the water table from groundwater pumping, damming and diversion of streams and rivers, agricultural and urban/residential development and reclamation.

Some cienegas (marshes) and permanent tanques (ponds) have been altered by woodcutting and livestock, the natural vegetation along the margins denuded by overgrazing. This reduces or eliminates critical cover for many amphibians and reptiles. The Great Plains Narrow-mouthed Toad (*Gastrophryne olivacea*), the Sonoran Desert endemic Sonoran Green Toad (*Bufo retiformis*) and the uniquely adapted Northern Casque-headed Frog (*Pternohyla fodiens*), share a limited distribution in the mesquite desert grasslands of extreme south-central Arizona. While their natural habitats may be jeopardized by these factors and groundwater pumpdown, these species adapt readily to artificial breeding sites such as roadside ditches. This versatility may help to insure their survival in the future.

Not all animals found in riparian ecosystems are restricted to these habitats. Many others are found here, often because of the increased richness of the plant communities and the benefits they afford in food, cover and climate control. Skinks like the colorful little Mountain Skink (*Eumeces tetragrammus*) and the more robust Great Plains Skink (*Eumeces obsoletus*) are often found among rocks, logs and leaf litter in the vicinity of streams. The large and active Canyon Spotted Whiptail (*Cnemidophorus burti*) is commonly seen in similar habitat where it forages for insects and spiders.

Many snakes enter riparian zones from time to time in search of prey. The Neotropical Vine Snake (*Oxybelis aeneus*) reaches its northern range limit in extreme southern Arizona. Here, most records have come from riparian canyons and the nearby slopes. This slender snake is aptly named, spending much of its time in shrubs or trees where it rests motionless, waiting patiently for its prey of lizards, insects, and occasionally small birds and rodents. Its mild venom is delivered with grooved fangs located in the rear of the upper jaws.

Another riparian associate often seen in the sheltered moist canyons is the Regal Ringneck Snake (*Diadophis punctatus*). This snake is drab olive, gray or black above, and has a bright reddish-orange ventral color that serves as a warning (aposematic) function. When the snake is threatened, the tail is coiled in a corkscrew configuration and presented to the predator while the head is hidden beneath its own coils. This serves to attract the predator's attention to the tail rather than to the more vulnerable head. Ringneck snakes are also mildly venomous, although the slightly enlarged rear teeth are not grooved. They feed on other snakes, lizards, amphibians and invertebrates.

The diversity of small animal life which depends wholly or in part upon riparian ecosystems represents an exciting part of the Southwestern wildlife heritage. As we have seen, they are most sensitive to the accelerated changes now occurring. Their importance as barometers of environmental quality cannot be overestimated.

ACKNOWLEDGEMENTS

I am grateful to Charles H. Lowe, Tom Van Devender, Cecil Schwalbe, Steve Hale and Peter Warren for sharing with me their rich knowledge of southwestern riparian herpetofauna and the complexities of its conservation.

FCSPRNCA0630

RECREATION BENEFICIAL USES CLAIMED

The BLM has been keeping some limited data on recreation usage within the San Pedro Riparian National Conservation Area. To date, visitor use figures have been arrived at through an informal compilation based on the following:

1. Visitor registers located at three different public access parking areas (located at highway river crossings).

2. Booksale and visitor register data from the Friends of the San Pedro River,Inc. bookstore which is located within the National Conservation Area.

3. Year-to-year observations of National Conservation Area staff based on;

   - chance contact with visitors while working on the property
   - frequency and size of organized talks and tours given by staff members
   - number of phone inquiries and written requests for information
   - meeting with visitors in-person at the Fairbank Administrative Site by the receptionist and by the other staff
   - volume of trash and required frequency of site clean-up and other maintenance at the various public access parking areas and other access points
   - number of law enforcement incident reports
   - volume of brochures and other handouts distributed to the public throughout the year
   - Increase and\or change in physical impacts caused by visitor use such as the extension of existing footpaths, creation of new footpaths, number of fire rings,etc.

Based on the above observations, there were an estimated 36,000 separate visits to the San Pedro Riparian National Conservation Area during Fiscal Year 1991. A certain number of these "visits" were made by the same visitors several times a year. Each of the 36,000 visits consisted of an average 2.5 hour stay within the National Conservation Area, for a total of 90,000 "visitor hours". Visitor use increased very rapidly from the time that the entire National Conservation Area was officially opened to public entry in May,1989, up to the present time. The initial rapid increase in public use will begin to level off for the next couple of years.

Future construction of a planned visitor center, and a limited amount of other visitor use facilities, will bring about a large and permanent increase in visitor use to the National Conservation Area. The visitor center will attract an increasing number of visitors from outside of the local area as general public awareness of this facility increases.

ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue, Phoenix, Arizona 85007
Telephone (602) 542-1553
Fax (602 256-0506

August 30, 1991

FIFE SYMINGTON
Governor

ELIZABETH ANN RIEKE
Director

Lester K. Rosenkrance, State Director
Bureau of Land Management
3707 N. 7th Street
P.O. Box 16563
Phoenix, Arizona 85001

RE: Application for Permit to Appropriate Public Water No. 33-90103, for the San Pedro Riparian National Conservation Area.

Dear Mr. Rosenkrance:

The Arizona Department of Water Resources (ADWR) has completed the review of the referenced application (as amended December 7, 1990), and the supporting resource assessment report dated March 1, 1989. The assessment report provided a thorough analysis of streamflow characteristics and adequately quantified water resource availability. Before a permit can be issued however, there are two issues relating to claimed beneficial uses that must be addressed in greater detail.

Wildlife and wildlife habitat is claimed as a beneficial use although only a very general statement regarding the obligate and facultative wildlife is given. If wildlife is to be considered a beneficial use, the ADWR minimum requirement is a species specific inventory of wildlife including birds, mammals, amphibians, and reptiles. A more detailed wildlife assessment, which the application claims is being conducted independent of this assessment, would further support this requested beneficial use.

Recreation, including aesthetics is also claimed as a beneficial use. As with other claimed beneficial uses, minimum data requirements apply. Since the San Pedro Riparian National Conservation Area has been open for visitation for approximately one year, the BLM must have gathered some data on recreation usage. Please submit any documentation you may have developed regarding current recreational use, particularly the results of user surveys or an estimate of annual visitor days.

If I can be of any assistance, please give me a call at (602) 542-1586.

Sincerely,

Tom Harbour
Hydrologist
Surface Water/Recharge Section

TH/ms

cc: Jim Burton, Arizona Game and Fish Department
Herb Dishlip, Water Management
Joe Stuart, Operations

FCSPRNCA0634

United States Department of the Interior

San Pedro Riparian
National Conservation Area
Bureau of Land Management
Rural Route 1, Box 9853
Huachuca City, AZ 85616
602/457-2265

RECEIVED
MAR 25 1992
OPERATIONS

Arizona Department of Water Resources
Attention: Ms. Patti Rocko
Surface Water Rights Systems
Operations Division
15 South 15 Th Avenue
Phoenix, Arizona 85007

March 20, 1991

RE: 33-90103

Dear Patti:

Enclosed please find completed and notarized forms for "Affidavit Of Appropriator", "Affidavit Of Witness" and "Proof Of Appropriation Of Water", as requested by your office for certification of above referenced instream flow permit.

Thank you for your help on this water right application process. Please refer any subsequent correspondence to me at the San Pedro BLM Office, RR1, box 9853, Huachuca City, Arizona, 85616, or call me at 1(602)457-2265.

Sincerely;

Ben Lomeli

Ben Lomeli,
Hydrologist

FCSPRNCA0635

AFFIDAVIT OF APPROPRIATOR

MAR 2 5 1992

STATE OF ARIZONA)
)ss.
County of Cochise)

I, Ben Lomeli, being first duly sworn, depose and say that I have read the above and foregoing proof of appropriation of water; that I know the contents thereof, and that the facts therein stated are true.

IN WITNESS WHEREOF, I have hereunto set my hand this 16th day of March, 1992.

Ben Lomeli
for B.L.M.

Subscribed and sworn to me this 16th day of MArch, 1992.

(Notary Seal)

Sandra M. Phillips
Notary Public

My commission expires 07-12-1992

AFFIDAVIT OF WITNESS

STATE OF ARIZONA)
)ss.
County of Cochise)

We, Greg Yuncevich, and Robin Stoddard

of The United States Bureau of Land Management, being first duly sworn, and depose and say that we are well acquainted with the facts and conditions set forth in the foregoing statement relative to proof of appropriation of water under Permit No. 33-90103, that we and each of us have been over and upon each tract described in said proof, and from such personal inspection have knowledge that all necessary ditches, dams and other diversion and distributing works have been constructed, and water used as stated therein; that we have carefully read such proof of appropriation, and that each and every statement contained therein is true to the best of our knowledge and belief.

Greg M Yuncevich
Robin Stoddard

Subscribed and sworn to me before this 16th day of March, 1992.

(Notary Seal)

Sandra M. Phillips
Notary Public

My Commission Expires 07-12-1992

DWR33-6B-11/90

FCSPRNCA0636

Arizona Department of Water Resources
MAR 2 5 1992 15 South 15th Avenue
Phoenix, Arizona 85007

Date Filed: 3/16/92

Application No. 33-90103.0001 Permit No. 33-90103.0000 County Cochise

PROOF OF APPROPRIATION OF WATER

1. Name and address of permit holder: U.S.D.I. Bureau of Land Management

2. Source of appropriable (surface) water supply: San Pedro River

   tributary of Gila River

3. Location of point of diversion:

   GLO Lot # _____, or NW 1/4 NW 1/4, Section 22, Township 23 N/S Range 22 E/W

4. Construction of works began on N/A and was completed on N/A

5. Date water was completely applied to stated beneficial use Time immemorial

6. Name, if any, and capacity of reservoir N/A

7. Specify quantity of water that has been applied to each beneficial use: 11,028 acre-feet
   (acre-feet or gallons)
   annually for recreation and wildlife including fish.

8. During what months is the water beneficially used? year long

9. Describe the location where the water is used. If for irrigation, in the column headed "Acres actually irrigated" fill in only the number of acres that have actually been irrigated in that location in the smallest units that will identify them:

GLO Lot #	1/4	1/4	1/4	Section(s)	Township (N/S)	Range (E/W)	Acres Actually Irrigated
From		NW	NW	22	23 S	22 E	N/A
TO		NE	NE	11	21 S	21 E	"
AND From		NE	NE	11	21 S	21 E	"
TO		NE	NW	21	18 S	21 E	"

DWR 33-5A-11/90

FCSPRNCA0637

10. (a). If a dam has been constructed, give description: Height, at downstream face N/A ft:

length on top N/A ft.; length on bottom N/A ft; material used and character of

construction N/A

(b). Give description of canal headgate: Width N/A ft.; depth N/A ft.; material used and

character of construction, N/A

(c). Size of canal: Width on top (at waterline) N/A ft.; width on bottom, N/A ft.;

depth of water N/A ft.; length N/A ft.; grade, N/A ft. fall per 1,000 ft.

Actual capacity, N/A sec.-ft. Give general description:

(d). Pipe line: Description of intake, N/A

Length of pipe, N/A ft.; diameter at intake, _____ in.; Difference in elevation between

intake and place of use, N/A ft. Actual capacity of pipe line, N/A cubic-feet/second

Give general description: N/A
(material: steel, wrought, cast iron, wood stave, etc.)

(e). Pumping plant: Give size and type of pump, N/A

Type of motor used N/A Horse power rating, N/A H.P. Actual capacity

of pump, N/A

(f). Distribution works: N/A (no.) N/A (tanks or troughs) Material N/A

N/A
(dimensions and capacity of each)

11. Domestic Use. State number of families and persons actually served, and describe other domestic uses of water
N/A

12. Stockwatering Use. State kind of stock served N/A

minimum and average number served per day during the months of the year water is used.

Maximum N/A Minimum N/A Average N/A

13. If for any purpose other than irrigation, stockwater or domestic, state the extent and nature of such use

In-situ non-consumptive uses for recreation and wildlife including fish.

FCSPRNCA0638

February 13, 1991

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

Bureau of Land Management
Arizona State Office
Attn: Lester K. Rosenkrance
3707 North 7th Street
Phoenix, Arizona 85011

Re: Application for Permit to Appropriate Public Water No. 33-90103

Dear Mr. Rosenkrance:

Enclosed please find a copy of a letter dated March 15, 1990 withdrawing the protest submitted by Dean R. Goodman, President of St. David Irrigation District against the referenced application.

However, there are two remaining protests still outstanding against the referenced applications.

The Department is still requiring a resolution of the protests and would appreciate your cooperation in this matter. A reminder that a copy of any correspondence to the protestant must also be sent to the Department for inclusion in the official record.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:mg

Enclosure

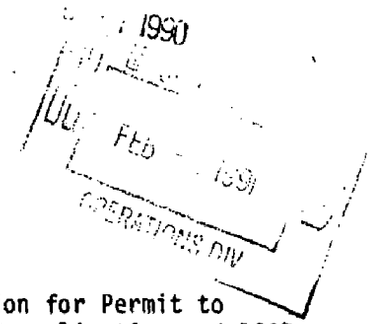
FCSPRNCA0639

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
3707 N. 7TH STREET
P.O. BOX 16563
PHOENIX, ARIZONA 85011

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
7250 (932)



Mr. Joe B. Stuart, Manager
Operations Division
Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

Dear Mr. Stuart:

The Bureau of Land Management (BLM) is amending Application for Permit to Appropriate Water No. 33-90103, items 3 and 4 of the 1985 application and 1987 amendment, to protect the natural values of the San Pedro Riparian National Conservation Area. The amounts of water applied for on page "A" (attachment to Permit Application of Huachuca Audubon Society, et al.) were amended in 1987. Those amounts are amended here by deleting specific references to claims for 60 percent or 80 percent of the water reaching the San Pedro during high flow periods.

The flows represented in Table I under Palominas correspond to the "Hereford to Charleston (segment 1)" river segment in page "A." Charleston/Tombstone flows in the table correspond to the "Charleston to a point 8 miles south of Benson (Segment 2)" river segment on page "A."

The "60 percent" and "80 percent" were high flow components in support of channel geomorphic conditions and processes. Since the flood flow requirements of the system as identified by the study team have become an obstacle in administering the base flow water right, they are excluded from this new amendment request. A separate application for only high flows is being submitted. The BLM continues to advocate that the protection of periodic flood flows is critical in maintaining the natural conditions of the channel and riparian systems. If major mainstem or tributary impoundments are proposed in the future, BLM requests that the State provide assurances for protection of short duration flood flows downstream as quantified in the high flow application. The beneficial uses being applied for under item 3 were amended by BLM in 1987 and remain as follows:

-- wildlife and fisheries, including wildlife and riparian habitat protection.

FCSPRNCA0640

-- recreation, including aesthetics.

We also reaffirm the following explanatory information concerning the beneficial uses and amounts of water included in the application:

> The requested amounts of water are needed to maintain sufficient water supplies to sustain the natural values of the San Pedro River. The natural values of the San Pedro River are inextricably linked to available water. Riparian vegetation, wildlife, aquatic values and recreation attributes are all dependent upon instream flows (including floods and related groundwater conditions). Through an intensive, interdisciplinary analysis of the critical factors that affect water-dependent values, the BLM has determined these amounts to be necessary to protect the proposed San Pedro Riparian National Conservation Area.

Please note these changes for the record. Pursuant to your recent conversations with our office and the Field Solicitor's office we would appreciate your efforts to expedite this application to permit before the end of January 1991. We are working to resolve protests with Sierra Vista and Tennaco. If you have any questions, contact Jim Renthal at (602) 640-5512.

Sincerely,

Lester K. Rosenkrance

Lester K. Rosenkrance
State Director

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OPERATIONS DIV

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FCSPRNCA0641

Requested Instream Flows for the BLM San Pedro River Properties

Instream flows are expressed as median daily flows for each month in the year. Summer instream flows are the portion of the median daily flow that meet minimum resource needs. Median flows are believed to be more representative of daily flow conditions than mean flows because of the highly skewed nature of daily flow distributions. The annual San Pedro River flow regime is stratified into four distinct seasons. The April-June spring season is the primary low flow period, and the July-September summer season is the primary high (flood) flow period for the River. A secondary low flow period occurs during the fall (October-November), and a secondary high flow period occurs during the winter (December-March). The requested flows reflect consideration for historic base-flow declines. These requested monthly base flows correspond to the following total annual volumes: Palominas = 3,666 acre-feet; Charleston/Tombstone = 11,028 acre-feet.

TABLE I

Period	Month	Requested Flows, cfs	
		Palominas	Charleston/Tombstone
Fall	October	3.7	12.2
	November	3.6	13.6
	December	5.5	17.1
	January	7.9	19.5
Winter	February	8.6	20.3
	March	6.3	18.9
	April	2.5	12.2
Spring	May	1.2	7.9
	June	0.6	4.2
	July	7.0	19.0
Summer	August	7.0	19.0
	September	7.0	19.0
Total Annual Volume (ac-ft)		3666	11028

1990

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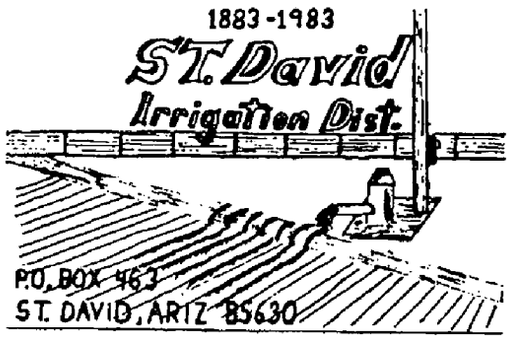
Enclosure

FCSPRNCA0642



5 February 1991

Mr. Joe B. Stuart, Manager
Operation Division
Arizona Department of Water Resources
15 South 15th Ave.
Phoenix, AZ 85007

Dear Mr. Stuart:

Enclosed you will find a copy of our snswer to Mr. Rosenkrance letter to you.

If we can be of further help please contact us.

Sincerely,

Dean R. Goodman

SDID BOARD MEMBERS
Dean R. Goodman, President
Wayne Gustafson, Member
Carl W. Black, Member

5 enclosures

CC: Lester Rosenkrance

FCSPRNCA0643

file copy

5 November 1985

Arizona Department of
Water Resources
99 East Virginia
Suite 100
Phoenix, Arizona 85004

Re: OBJECTION to
Application No. 33-90103
Sierra Club
Legal Defense Fund

Gentlemen:

(1) During the approximately ten (10) months a year that the San Pedro River runs on the surface, we as Saint David Irrigation District take our irrigation water that free flows to our irrigation system, and at times of low water this includes the entire amount of surface water.

Approximately two (2) months a year we pump sub-surface water for our irrigation.

(2) Our water was first recorded of being used in 1881 and has been used continually since that time.

(3) Since 1881 we have records of using continually 6000 acre feet of water per year. Of this, 500 acre feet per month is used for approximately 10 months while river is flowing, and 500 acre feet is pumped per month when river is not flowing.

(4) 1600 acres of irrigated land on the East side of San Pedro River between El Paso pipeline on the South and continuing North to approximately 1 mile North of Highway 80 as it passes East and West through St. David.

At various times since 1881 our diversion dam has been located from old town of Contention to present location of Dam for diversion two (2) miles South of El Paso pipeline crossing.

(5) Our use of water is confirmed and recorded in the Arizona Water Commission Bulletin #4 Hydrologic Conditions in San Pedro Valley, Arizona 1971.

See attached map.

Respectively,

Wayne Gustafson
Member
St. David Irrigation District Board

FEB - 1 1991
OPERATIONS DIV.

FCSPRNCA0644

United States Department of the Interior

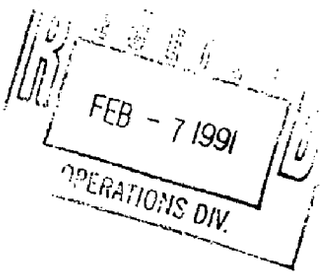
BUREAU OF LAND MANAGEMENT
SAFFORD DISTRICT OFFICE
425 E. 4TH STREET
SAFFORD, ARIZONA 85546
(602)457-2265

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

7200
(045)

May 21, 1990



St. David Irrigation District
Board of Directors
P.O. Box 463
St. David, AZ 85630

Re: 33-90103

Dear Board Members:

We received a copy of your letter (March 15, 1990) to the Arizona Department of Water Resources requesting official withdrawal of your protest to instream flow application #33-90103, now assigned to the United States Bureau of Land Management (BLM), for the San Pedro River.

Thank you so much for your cooperation. Withdrawal of your protest is a giant step in protecting the conservation area for future generations. Thank you for helping us protect this wonderful public amenity. It is one of the few reaches of river retaining this unique southwestern habitat.

We also thank you for the willows planted near the diversion dam. These too will help BLM maintain favorable conditions of flow in the San Pedro.

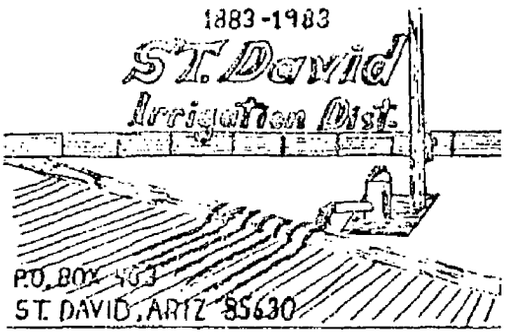
Your actions are greatly appreciated. We look forward to continuing to work with you on many more mutually beneficial projects. Please call anytime I can be of assistance.

Sincerely,

Erick G. Campbell

Erick G. Campbell
San Pedro Project Manager

FCSPRNCA0645



Arizona Department of Water Resources
Operation Division
Attention: Mr. Joseph Stuart
15 S. 15th Ave.
Phoenix, AZ 85007

15 March 1990

RE: 33-90103

Dear Mr. Stuart,

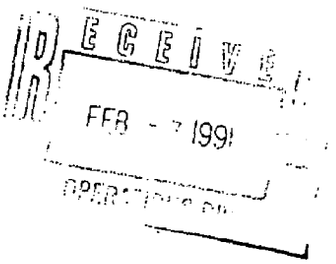
The Saint David Irrigation District (SDID) hereby requests official withdrawal of its protest filed against subject water rights application.

Specifically, SDID now fully recognizes how it is in our own best interest to protect instream flows in the San Pedro River immediately upstream of our point of diversion.

Therefore, SDID formally request official withdrawal of said protest filed against application #33-90103, now assigned to the U.S. Department of Interior - Bureau of Land Management (BLM).

However, we will immediately refile our protest in the event of any transfer of this assignment (application 33-90103) from BLM to any or all others.

Sincerely,



SDID BOARD MEMBERS
Dean R. Goodman, President
Wayne Gustafson, member
Carl W. Black, member

cc: Ray Brady U.S. BLM
Erick Campbell U.S. BLM

FCSPRNCA0646

December 13, 1990

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

St. David Irrigation District
P. O. Box 463
St. David, Arizona 85630

Re: Application for a Permit to Appropriate Public Water
No. 33-90103

Dear Sirs:

Enclosed please find a copy of a letter submitted by Lester Rosenkrance on behalf of the Bureau of Land Management amending the referenced application. Carefully review the letter to determine if Mr. Rosenkrance has brought forth any additional information that would lead to resolution of your protest. The Department requests that you reply directly to the applicant within thirty (30) days from the date of receipt of this letter. You are also requested to send a copy of your reply to the Department for inclusion in the official record.

The Department of Water Resources urges both parties to make a sincere effort at resolving the protest. Essentially, both parties must negotiate for a resolution of the issues. The negotiation may include an agreement to modify the application.

The Department will consider intervention in this matter if no resolution is forthcoming. In that event, the administrative actions taken by the Department will be based, in part, on the information contained in the application, the issues brought forth in the protest, and any information contained in correspondence pertaining to this matter.

The Department must be notified of any agreement reached through negotiation requiring modification of the original application. The Department also requests copies of any correspondence for inclusion in the official record.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:as

Enclosures

cc: Lester Rosenkrance, Bureau of Land Management

RECEIVED
FEB - 7 1991

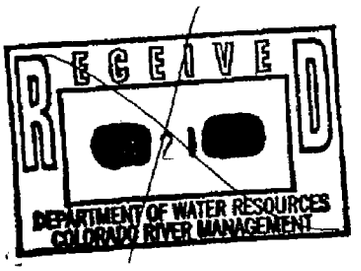
FCSPRNCA0647

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
PHOENIX FIELD OFFICE
One Renaissance Square
Two North Central Avenue
Suite 500
Phoenix, Arizona 85004

COMM. (602) 379-4756
(602) 379-4127
FTS: 261-4756
FAX: 261-4127

BLM.PX.2500
BIA.PX.0008

December 19, 1990



RECEIVED
DEC 21 1990
WATER RESOURCES

Mr. Carl Frieders
Mayor, City of Sierra Vista
2400 East Tocoma Street
Sierra Vista, AZ 85635

RE: BLM Application for Instream Flow Water Right on the San Pedro River

Dear Mayor Frieders:

Our office represents the Bureau of Land Management (BLM) and other agencies in the U.S. Department of the Interior in regard to legal matters. This letter concerns the pending BLM application for a state law water right on the San Pedro River.

Representatives from the BLM have provided me with information concerning the meeting held on October 9th between the BLM and representatives from Cochise County and your City in regard to this matter. The purpose of that meeting was to discuss the possibility of having the City's protest against the BLM application withdrawn. As I understand it, the City has agreed to consider that request, but it has not yet decided to withdraw the protest. Apparently the City and the County have raised several areas of concern which include the relationship of the Gila River adjudication to this matter. The purpose of this letter is to attempt to address those concerns.

1. Amendment of the Application - first, it is important to point out that the application has been amended to separate the flushing flow provision into a separate application to be filed later. The Department of Water Resources (DWR) had expressed difficulty with this aspect of the application and BLM eventually determined that the provision was not necessary to the application. The elimination of that provision should be important to the City since the amended application clearly poses no conflict with any claim the City has to surface water sources. This is particularly germain to your letter of protest wherein you referenced several pending surface water applications on a tributary. As amended, the BLM application poses no conflict on that tributary since the tributary is not a perennial flow stream and the BLM's application is for base flow in the San Pedro River. Furthermore, I presume that the City's pending applications pre-

FCSPRNCA0648

dated the BLM application (as originally filed by the Sierra Club), thus giving you a position of priority if there were a conflict.

For these reasons, I suggest to you that the City's protest may not be effective in that it does not allege valid grounds for a protest. First, the protest does not raise issues in regard to public safety or public interest (ARS 45-153). Second, the protest does not demonstrate any conflict with vested water rights. Accordingly, the City's protest is really not effective as a protest and may therefore be disregarded by DWR in this process.

2. Connection to Indian Reserved Water Rights - representatives of the City and County at the October 9th meeting apparently expressed concern that the federal government may claim additional amounts of water from the San Pedro in two ways: 1) as part of BLM's federal reserved water right (yet to be quantified by the court), and 2) as part of the water rights for the downstream Gila River Indian Reservation (also yet to be quantified by the court). I will address these arguments separately.

In regard to the BLM reserved right, the BLM is in the process right now of quantifying its full claim to water under the reserved water right created pursuant to federal law. In large part, this claim will parallel what has been requested under state law. In fact, the original claim filed by BLM for the federal preserve used the same numbers as set forth in the state application. However, amendments are now being considered and will be filed shortly by BLM. I recommend that you review this matter with BLM officials in order to determine the magnitude of the difference.

If there is a difference, I suggest that this is an insignificant issue since the two matters are on different tracks in different forums. It should be noted, however, that the BLM's decision to proceed on the state application is in part an effort to allow the state authorities to quantify the instream flow entitlement prior to the court's engagement of that issue. I believe that the DWR officials welcome this opportunity, and I would think that the City and County would welcome it as well. Since the purposes covered under the federal law are broader than the purposes covered under state law, it is not unreasonable to conclude that the federal claim may in some respects be larger in quantity (for administrative uses, domestic uses, etc.), but the base instream flow needs should be largely the same if not identical.

In regard to what will be done by the Bureau of Indian Affairs (BIA) and the downstream Indian tribe, the most that can be said is that BLM has no control over that matter. Given the government's trust responsibility to the Tribe, the Department cannot compromise an Indian water rights claim simply to advance a BLM application under state law. Furthermore, at this time it is not

FCSPRNCA0649

clear what the nature and scope of the BIA-Indian claim to the San Pedro will be. That will be decided as the government gets closer to the adjudication of the Gila River Reservation HSR. In other words, there is no way to clarify or identify what will or will not be done by the BIA within the context of the BLM state law application. To the extent that you seek some assurance in this area, or some form of commitment from the Department, that simply cannot be provided. I'm sure that John McKinnon, the County's attorney, can explain this to you since he has in the past represented the Navajo Tribe in regard to water matters.

However, I suggest that you should not overlook the advantage which may come from having the flow right quantified by state authorities. As you know, there is at this time significant energy behind a settlement of the Gila River Tribe's water rights claims. As I have told people from your area before, in my judgment there will not be a settlement of that reservation's water right without a San Pedro component. In my view, the quantification of the base flow right for the BLM preserve would be helpful as an important benchmark from which a settlement on that tributary could be crafted. Of course, it is too early to discuss details, but common sense dictates that the BLM and the Tribe are after the same basic goal -- they want to see the river flow down to the confluence with the Gila River in as much the same condition as it has historically. In addition, both entities will want to protect that flow from future depletions resulting from diversions by junior appropriators. Finally, both entities will want to protect against large diversions via new dams, but, as you know, such diversions are not proposed or planned, and the watershed does not really facilitate that kind of development.

In summary, while I can appreciate your concern over the potential BIA-Indian claims, I suggest that the City and the County need to consider the following points: 1) BLM cannot affect what the BIA and the Tribe will do in the adjudication; 2) the BLM state application is really a separate matter, and your concern over the adjudication process does not amount to a valid protest of the BLM state application; 3) if your concern is not a valid protest, DWR will either ignore your protest or determine it to be invalid at a hearing; and 4) your position may not reflect the benefit you may obtain by having state authorities quantify the instream flow needs in advance of the court deciding that matter as part of the federal water right.

3. Likely result of a hearing - it should be obvious that BLM seeks to have your protest withdrawn so as to avoid a DWR hearing if possible. However, if you will not withdraw your protest, we will request DWR to schedule a hearing as soon as possible. If that happens, we feel confident that your protest will not hold up since you have not articulated any interference with prior vested rights. In this context, your protest then becomes a statement to BLM and the public that you are not supportive of

BLM's efforts to protect the flow of the river and the associated riparian area. I assume that is not the message you desire to convey.

4. What is in the best interest of the river - I suppose the most important point is what the City truly wants to do in order to help protect the resource value of the San Pedro. As I understand it, you have always said that the City does not want to see the river dried up or otherwise impaired. If that is the case, then the City should be wholly supportive of BLM's application, particularly since it is under the umbrella of state law. Even if the City may eventually resist BIA or tribal claims which exceed the BLM state water right, the City may nevertheless desire to support the BLM base flow entitlement which guarantees protection of the riparian resources. In my view you can do both without compromising your position in any way whatsoever. But by supporting the BLM application, or at least not protesting it, you will be making a clear statement that the City wants to see the resource protected and preserved. By maintaining your protest, it seems to me that you convey the opposite message.

In conclusion, I hope that these points will assist you in arriving at a decision in regard to your protest. Since we would like to make progress on this application as soon as possible, it would be helpful to have your decision on this matter by mid-January. If you conclude that you cannot withdraw the protest, we will ask DWR to schedule the matter for hearing.

If I can answer any questions in regard to this letter, or otherwise provide you with information, please give me a call at (602) 379-4756. Thank you for your attention to this important matter.

Sincerely,

Fritz L. Goreham
Field Solicitor

William H. Swan
For the Field Solicitor

cc: Mr. Herbert Dishlip
Arizona Department of
Water Resources
15 South 15th Avenue
Phoenix, AZ 85007-2607

Mr. John McKinnon
County Attorney's Office
Cochise County
P.O. Drawer CA
Bisbee, AZ 85603

FCSPRNCA0651

Mr. James Renthal
Arizona State Office
Bureau of Land Management
P.O. Box 16563
Phoenix, AZ 85011

Mr. Ray Brady
Safford District Office
Bureau of Land Management
425 East 4th Street
Safford, AZ 85546

December 13, 1990

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

City of Sierra Vista
2400 East Tacoma Street
Sierra Vista, Arizona 85635

Re: Application for a Permit to Appropriate Public Water
No. 33-90103

Dear Sirs:

Enclosed please find a copy of a letter submitted by Lester Rosenkrance on behalf of the Bureau of Land Management amending the referenced application. Carefully review the letter to determine if Mr. Rosenkrance has brought forth any additional information that would lead to resolution of your protest. The Department requests that you reply directly to the applicant within thirty (30) days from the date of receipt of this letter. You are also requested to send a copy of your reply to the Department for inclusion in the official record.

The Department of Water Resources urges both parties to make a sincere effort at resolving the protest. Essentially, both parties must negotiate for a resolution of the issues. The negotiation may include an agreement to modify the application.

The Department will consider intervention in this matter if no resolution is forthcoming. In that event, the administrative actions taken by the Department will be based, in part, on the information contained in the application, the issues brought forth in the protest, and any information contained in correspondence pertaining to this matter.

The Department must be notified of any agreement reached through negotiation requiring modification of the original application. The Department also requests copies of any correspondence for inclusion in the official record.

Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:as

Enclosures

cc: Lester Rosenkrance, Bureau of Land Management

FCSPRNCA0653

December 13, 1990

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

St. David Irrigation District
P. O. Box 463
St. David, Arizona 85630

Re: Application for a Permit to Appropriate Public Water
No. 33-90103

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Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:as

Enclosures

cc: Lester Rosenkrance, Bureau of Land Management

FCSPRNCA0654

December 13, 1990

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

Rose Mofford, Governor
N. W. Plummer
Director

15 South 15th Avenue
Phoenix, Arizona 85007

Tenneco West Company
P. O. Box 2268
Tucson, Arizoa 85702

Re: Application for a Permit to Appropriate Public Water
No. 33-90103

Dear Sirs:

Enclosed please find a copy of a letter submitted by Lester Rosenkrance on behalf of the Bureau of Land Management amending the referenced application. Carefully review the letter to determine if Mr. Rosenkrance has brought forth any additional information that would lead to resolution of your protest. The Department requests that you reply directly to the applicant within thirty (30) days from the date of receipt of this letter. You are also requested to send a copy of your reply to the Department for inclusion in the official record.

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Yours truly,

Joe B. Stuart
Manager, Surface Water Rights Systems
Operations Division
Telephone (602) 542-1581

JBS:as

Enclosures

cc: Lester Rosenkrance, Bureau of Land Management

FCSPRNCA0655

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
3707 N. 7TH STREET
P.O. BOX 16563
PHOENIX, ARIZONA 85011

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
7250 (932)

[illegible] 7 1990

Mr. Joe B. Stuart, Manager
Operations Division
Arizona Department of Water Resources
15 South 15th Avenue
Phoenix, Arizona 85007

Dear Mr. Stuart:

The Bureau of Land Management (BLM) is amending Application for Permit to Appropriate Water No. 33-90103, items 3 and 4 of the 1985 application and 1987 amendment, to protect the natural values of the San Pedro Riparian National Conservation Area. The amounts of water applied for on page "A" (attachment to Permit Application of Huachuca Audubon Society, et al.) were amended in 1987. Those amounts are amended here by deleting specific references to claims for 60 percent or 80 percent of the water reaching the San Pedro during high flow periods.

The flows represented in Table I under Palominas correspond to the "Hereford to Charleston (segment 1)" river segment in page "A." Charleston/Tombstone flows in the table correspond to the "Charleston to a point 8 miles south of Benson (Segment 2)" river segment on page "A."

The "60 percent" and "80 percent" were high flow components in support of channel geomorphic conditions and processes. Since the flood flow requirements of the system as identified by the study team have become an obstacle in administering the base flow water right, they are excluded from this new amendment request. A separate application for only high flows is being submitted. The BLM continues to advocate that the protection of periodic flood flows is critical in maintaining the natural conditions of the channel and riparian systems. If major mainstem or tributary impoundments are proposed in the future, BLM requests that the State provide assurances for protection of short duration flood flows downstream as quantified in the high flow application. The beneficial uses being applied for under item 3 were amended by BLM in 1987 and remain as follows:

-- wildlife and fisheries, including wildlife and riparian habitat protection.

FCSPRNCA0656

-- recreation, including aesthetics.

We also reaffirm the following explanatory information concerning the beneficial uses and amounts of water included in the application:

> The requested amounts of water are needed to maintain sufficient water supplies to sustain the natural values of the San Pedro River. The natural values of the San Pedro River are inextricably linked to available water. Riparian vegetation, wildlife, aquatic values and recreation attributes are all dependent upon instream flows (including floods and related groundwater conditions). Through an intensive, interdisciplinary analysis of the critical factors that affect water-dependent values, the BLM has determined these amounts to be necessary to protect the proposed San Pedro Riparian National Conservation Area.

Please note these changes for the record. Pursuant to your recent conversations with our office and the Field Solicitor's office we would appreciate your efforts to expedite this application to permit before the end of January 1991. We are working to resolve protests with Sierra Vista and Tennaco. If you have any questions, contact Jim Renthal at (602) 640-5512.

Sincerely,

Lester K. Rosenkrance

Lester K. Rosenkrance
State Director

1990

FCSPRNCA0657

Requested Instream Flows for the BLM San Pedro River Properties

Instream flows are expressed as median daily flows for each month in the year. Summer instream flows are the portion of the median daily flow that meet minimum resource needs. Median flows are believed to be more representative of daily flow conditions than mean flows because of the highly skewed nature of daily flow distributions. The annual San Pedro River flow regime is stratified into four distinct seasons. The April-June spring season is the primary low flow period, and the July-September summer season is the primary high (flood) flow period for the River. A secondary low flow period occurs during the fall (October-November), and a secondary high flow period occurs during the winter (December-March). The requested flows reflect consideration for historic base-flow declines. These requested monthly base flows correspond to the following total annual volumes: Palominas = 3,666 acre-feet; Charleston/Tombstone = 11,028 acre-feet.

TABLE I

Period	Month	Requested Flows, cfs	
		Palominas	Charleston/Tombstone
Fall	October	3.7	12.2
	November	3.6	13.6
	December	5.5	17.1
	January	7.9	19.5
Winter	February	8.6	20.3
	March	6.3	18.9
	April	2.5	12.2
Spring	May	1.2	7.9
	June	0.6	4.2
	July	7.0	19.0
Summer	August	7.0	19.0
	September	7.0	19.0
Total Annual Volume (ac-ft)		3666	11028

1990

Enclosure

FCSPRNCA0658

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
SAFFORD DISTRICT OFFICE
425 E. 4TH STREET
SAFFORD, ARIZONA 85546

(602) 428-4040

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

7250
(043)

May 23, 1989

Mr. Lawrence A. Ramsey
Section Manager
Surface Water/Adjudication
Arizona Department of Water Resources
15 S. 15th Avenue
Phoenix, AZ 85007

Dear Mr. Ramsey:

The pending application case file for Application no. 33-90103, pertaining to the BLM San Pedro River Properties, contains two documents that were submitted by the Fish and Wildlife Service. The documents are entitled: Land Protection Plan for the San Pedro River, dated 12/12/85, and U.S. Department of the Interior, Environmental Assessment, Proposed Land Acquisition, San Pedro River National Wildlife Refuge, Cochise County Arizona, September 1979.

We respectfully request the removal of the documents from the case file. Congressional legislation has officially designated the Bureau of Land Management as the custodian of the lands. Therefore, the Fish and Wildlife Service documents are no longer pertinent. Thank you!

Sincerely,

Ray Brady
District Manager

FCSPRNCA0659

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
SAFFORD DISTRICT OFFICE
425 E. 4TH STREET
SAFFORD, ARIZONA 85546
(602) 428-4040

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
7250
(043)

February 16, 1989

Mr. Lawrence A. Ramsey
Section Manager
Surface Water/Adjudication
Department of Water Resources
15 S. 15th Ave.
Phoenix, Arizona 85007

Dear Mr. Ramsey:

In December 3, 1987, the Arizona State Office of the Bureau of Land Management submitted an amendment to Application for Permit to Appropriate Water, No. 33-90103. The amendment was for specified uses and amounts of instream flow for the BLM San Pedro River Properties.

At this time, the Safford District would like to have the following documents entered into the record and placed in the pending application case file. The documents are: 1) Place of Use (by quarter quarter); 2) copy of the Warranty Deed for properties; 3) copy of the Denver Service Center Report "Assessment of Water Conditions and Management Opportunities in Support of Riparian Values: BLM San Pedro River Properties, Arizona" (upon which the requested amounts of flow were based); 4) draft copy of the Safford District assessment document entitled "San Pedro River Riparian Management Plan and Environmental Impact Statement"; and 5) map of the lands and river system.

Please include these documents in the case file. If you have any question, please contact Delbert Molitor, District Hydrologist.

Sincerely,

Frank Rowley
Acting District Manager

Enclosures: 5

FCSPRNCA0660

7. Place of Use

Within the Gila and Salt River Meridian, Cochise County, Arizona

T. 18 S., R. 21 E., Sec. 21, NENW, NWNW, SWNW, SENW, NWSW, SWSW; Sec. 28, NENW, NWNW, SWNW; Sec. 29, SENE, NESE, SESE; Sec. 32, NENE, SENE, NESE, SESE.

T. 19 S., R. 21 E., Sec. 5, NENE; Sec. 4, SWNW, NESW, NWSW, SWSW, SESW; Sec. 8, NENE, SENE, NESE, NWSE, SWSE, SESE; Sec. 9, SWSW; Sec. 16, SWSW, SESW; Sec. 17, NWNE, SWNE, SENE, NENW, NESE, SESE; Sec. 21, SWNE, NENW, SENW, NESE, NWSE, SWSE; Sec. 27, SWSW; Sec. 28, NWNE, SWNE, NESE, SESE; Sec. 33, NENE; Sec. 34, NWNW, SWNW, NWSW, SWSW.

T. 20 S., R. 21 E., Sec. 3, NWNW, SWNW, NWSW, SESW; Sec. 10, SWNE, NENW, SENW, NESE, NWSE, SESE; Sec. 15, NENE, SENE, NESW, NWSW, SWSW, SESW, NESE, NWSE, SWSE; Sec. 22, SWSE, NENW, NWNW, SENW, NESE, NWSE, SESE; Sec. 26, NWNW, SWNW, NWSW; Sec. 27, NESE, SESE; Sec. 34, NENE; Sec. 35, SWNW, NWSW, SWSW.

T. 21 S., R. 21 E., Sec. 2, NENE, NWNE, SENE, NESE, NWSE, SWSE, SESE; Sec. 11, NENE; Sec. 12, SWNW, SENW, NESW, SESW; Sec. 13, NWNE, SWNE, SENE, NENW, NESE.

T. 21 E., R. 22 E., Sec. 18, SWNW, NWSW, SWSW, SESW; Sec. 19, NWNE, SWNE, NENW, SENW, NESW, NWSE, SWSE; Sec. 30, NWNE, SWNE, SENE, NESE, NWSE, SESE; Sec. 31, NENE, SENE, NESE, SESE.

T. 22 S., R. 22 E., Sec. 5, NWNW, SWNW, NESW, NWSW, SESW; Sec. 6, NENE; Sec. 8, NENW, SENW, NWSE, SWSE; Sec. 17, NWNE, SWNE, NWSE, SWSE, SESE; Sec. 20, NENW, SWNE, NESE, NWSE, SWSE; Sec. 28, SWNW, NWSW, SWSW; Sec. 29, NENE, SENE; Sec. 33, NENW, SENW, NESW, NESE, NWSE, SWSE, SESE; Sec. 34, SWSW.

T. 23 S., R. 22 E., Sec. 3, NWNW; Sec. 4, NENE, SENE, NESE, SWSE, SESE; Sec. 9, NWNE, NENE, SENE, NESE, SESE; Sec. 15, NWNW, SWNW, NESW, NWSW, SWSW, SWSE; Sec. 16, NENE, SENE; Sec. 22, NWNW.

FCSPRNCA0661

FEE # 86 04727
OFFICIAL RECORDS
COCHISE COUNTY
DATE HOUR
03/07/86 12
REQUEST OF
TICOR TITLE INSURANCE CO.
CHRISTINE RHODES-RECORDER
FEE : 9.00 PAGES : 17

MAR 7 1986 12P.M.
H-2
9.00

RECEIVED
MAR 1 1989
DEPT. OF
WATER RESOURCES

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS:

That, ARIZONA WHITE TANK ASSOCIATES, an Arizona General Partnership, Grantor herein, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and in accordance with the Act of October 21, 1976 (90 Stat. 2743), does hereby convey unto the UNITED STATES OF AMERICA, its successors and assigns forever, Grantee herein, that certain real property located in the County of Cochise, State of Arizona, described in Exhibit "A" attached hereto and incorporated herein by this reference together with all rights and privileges appurtenant thereto.

TO HAVE AND TO HOLD the same unto the Grantee, its successors and assigns to warrant and defend the title as against all acts of Grantor herein and no other.

SUBJECT to all taxes, assessments, reservations in patents, easements, rights-of-way, leases, liens, encumbrances, covenants, conditions, restrictions, obligations, liabilities and other matters detectible of public record and unrecorded leases identified in the Land Exchange Contract as Exhibit C thereto or visible by inspection of the property.

SUBJECT TO, any and all minerals owned by Grantee or heretofore reserved or otherwise owned by others.

IN WITNESS WHEREOF, Grantor has caused these presents to be executed on this, the 6 day of March, 1986.

ARIZONA WHITE TANKS ASSOCIATES, an Arizona General Partnership
H. B. BELL (WHITE TANK) INC., General Partner

By _____
President

State of Arizona)
)ss
County of Maricopa)

The foregoing instrument was acknowledged before me this 6 day of March, 1986, by H. B. Bell, President, H. B. Bell (White Tank) Inc., an Arizona corporation, partner on behalf of Arizona White Tank Associates, an Arizona General Partnership.

_____
Notary Public

86004727

ALAN COOTLEY
MARICOPA COUNTY
My Comm. Expires Jan. 11, 1989

FCSPRNCA0662

SAN PEDRO LANDS

COCHISE COUNTY, ARIZONA

GILA AND SALT RIVER MERIDIAN

T. 18 S., R. 20 E.

Sec. 24,	Parcels 1, 2, 3 and 4 of Survey Book 2, page 61, records of Cochise County, Arizona;	164.78

T. 18 S., R. 21 E.

Sec. 19,	Parcels 5 through 20 of Survey Book 2, page 61, records of Cochise County, AZ., and hereinafter amended per Survey Book 3, page 40 and 41;	632.30
Sec. 20,	Part of Parcel 8 in Sec. 19, above;	7.48
	Part of Parcel 12 in Sec. 19, above;	5.03
	E½ and all that portion of the NW¼ lying east of the easterly boundary of the Southern Pacific Transportation Company's right-of-way;	419.21
	EXCEPT the north 30 feet of the NW¼, (County Road) and,	
	EXCEPT the south 35.5 acres of that portion of the NW¼ lying west of the east line of the New Mexico and Arizona Railroad Company's right-of-way.	
Sec. 29,	NE¼, and that portion of the W½ lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way, and Parcels 34 and 35 of Amended Survey Book 3, page 42, records of Cochise Co., Arizona.	455.10

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T. 18 S., R. 21 E. (Continued)

Sec. 30,	Parcels 22 through 33 of Survey Book 2, page 61, records of Cochise County.	475.42
Sec. 32,	Those portions of Lots 3 and 6 lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way,	99.58
	and	
	Parcels 37 and 38 of Survey Book 2, page 61, records of Cochise County.	

T. 20 S., R. 21 E.

Sec. 16,	Lots 1-4, incl., W½NW¼, SW¼;	404.72
Sec. 21,	Lots 1-4, incl., SW¼SE¼;	198.36
Sec. 27,	Lot 1;	9.55
Sec. 28,	Lots 1-4, incl., W½E½;	300.90
Sec. 33,	E½;	320.00
Sec. 34,	Lots 1-4, incl.	102.40

T. 21 S., R. 21 E.

Sec. 3,	Lot 5, SW¼NE¼, S½NW¼;	142.08
Sec. 11,	Lots 3-6, incl., SE¼NW¼, S½NE¼, S½;	485.37
	EXCEPT a strip of land 66 feet wide across Section 11, the centerline is more particularly described as follows:	
	Commencing at the southeast corner of said Section 11;	
	Thence S. 89° 48' 24" W., 2,136.05 feet along the south line of said Section 11 to the Point of beginning;	
	Thence N. 23° 40' 15" W. 389.16 feet to a point of curvature on a tangent curve, concave to the east;	

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T. 21 S., R. 21 E. (Continued)

Thence northerly, along the arc of said curve, to the right, having a radius of 603.11 feet and a central angle of 66°43'40" for an arc distance of 702.39 feet to a point of tangency;
Thence N. 43° 03' 25" E., 307.34 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,032.54 and a central angle of 21° 14' 35" for an arc distance of 382.83 feet to a point of tangency;
Thence N. 21° 48' 50" E., 749.26 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 43° 09' 21" for an arc distance of 454.27 feet to a point of tangency;
Thence N. 21° 20' 31" W., 393.42 feet to point of curvature on a tangent curve, concave to the east;
Thence northerly, along the arc of said curve, having a radius of 603.11 feet and a central angle of 47° 15' 21", for an arc distance of 497.43 feet to a point of tangency;

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T. 21 S., R. 21 E. continued

Thence N. 25˚ 54' 50" E., 394.68 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1853.64 feet and a central angle of 02˚ 11' 19" for an arc distance of 70.81 feet to a point of non-tangency on the south line of Lot 2 of said Section 11, said point being the Point of Terminus;

Sec. 12,	NE¼SW¼, S½SW¼;	120.00
	EXCEPT from said NE¼SW¼, the following parcel as conveyed to El Paso Southwestern Railroad Company, an Arizona Corp., in Deed Recorded November 6, 1911, in Book 53 of Deeds of Real Estate, at page 220:	
	A strip of land approximately 200 feet in width, over, through, across and upon the said NE¼SW¼, lying and situate one hundred feet in width on either side of the center-line of survey for relocation of the El Paso and Southwestern Railroad between stations of Lewis Springs and Fairbanks as now surveyed and staked on the ground.	
Sec. 13,	SW¼NE¼, W½, W½SE¼, SE¼SE¼;	480.00
Sec. 14,	All;	629.50
	EXCEPT a strip of land 66 feet wide across Section 14, the centerline being more particularly described as follows:	

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T. 21 S., R. 21 E. continued

Commencing at the southwest corner of said Section 14;

Thence S. 89° 53' 47" E., 656.33 feet along the south line of said Section 14 to the Point of Beginning;
Thence N. 51° 27' 25" E., 1,353.52 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 9,276.72 feet and a central angle of 04° 27' 01" for an arc distance of 720.54 feet to a point of tangency;
Thence N. 55° 54' 26" E., 1,214.80 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve to the left, having a radius of 723.31 feet and a central angle of 38° 34' 12" for an arc distance of 486.91 feet to a point of tangency;
Thence N. 17° 20' 14" E., 983.95 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 41° 00' 29" for an arc distance of 431.66 feet to a point of tangency;
Thence N. 23° 40' 15" W., 1,741.49 feet to a point on the north line of said Section 14, said point being the Point of Terminus, said point being N. 89° 48' 24" E., 509.97 feet along said north line from the north quarter corner of said Section 14;

The length of the above described centerline is 6,932.87 feet, containing an area of 10.50 acres more or less.

Sec. 23, All; 638.69

EXCEPT a strip of land 66 feet wide across Section 23, the centerline being more particularly described as follows:

FCSPRNCA0667

T. 21 S., R. 21 E. continued

Commencing at the northwest corner of said Section 23;

Thence S. 00° 02' 11" E., 562.94 feet along the west line of said Section 23 to the Point of Beginning, said point being on a non-tangent curve with a local radial bearing of S. 42° 56' 18" E., concave to the southeast;

Thence northeasterly, along the arc of said curve, to the right, having a radius of 10,415.48 feet and a central angle of 04° 23' 43" for an arc distance of 798.99 feet to a point of tangency;

Thence N. 51° 27' 25" E., 64.88 feet to a point on the north line of said Section 23, said point being the Point of Terminus, said point being S. 89° 53' 47" east 656.33 feet from the northwest corner of said Section 23.

The length of the above centerline is 863.87 feet containing an area of 1.31 acres more or less.

Sec. 24,	All;	640.00
Sec. 25,	Lots 1-6, incl., NW¼NE¼, N½NW¼;	351.42
Sec. 26,	E½;	320.00
Sec. 36,	Lots 1-4, incl., SW¼NW¼, W½SW¼.	278.08

T. 22 S., R. 21 E.

Sec. 12,	SW¼NE¼, SW¼, NW¼SE¼;	240.00
Sec. 13,	NW¼NW¼;	40.00
Sec. 14,	NE¼NE¼.	40.00

T. 21 S., R. 22 E.

Sec. 7,	SE¼SW¼, SW¼SE¼;	80.00
Sec. 18,	NE¼NW¼.	40.00

Together with an easement for road purposes over and upon Lot 1 of said Section 18 described as follows:

FCSPRNCA0668

T. 21 S., R. 22 E. continued

(A) The south fifteen-(15.00) feet thereof and

(B) A strip of land sixty (60.00) feet in width, the centerline being particularly described as follows:

Beginning at a point on the north line of said Section 18, said point being N. 89° 42' E., 813.64 feet from the northwest corner of said Section 18;

Thence S. 03° 34' E., 228.82 feet;
Thence S. 19° 53' W., 1,164.14 feet to a point on the south line of Lot 1 of said Section 18, said point being N. 89° 42' E., 431.94 feet from the southwest corner thereof.

T. 23 S., R. 22 E.

Sec. 14,	Parcels 12, 13, 15 through 19 inclusive of Survey Book 2, page 8, records of Cochise County, Arizona;	281.59
Sec. 15,	Parcels 1, 2, and 3 of Survey Book 2, page 8, records of Cochise County, Arizona,	197.29
	And that portion of the S½ of Sec. 15, lying between the east line of County Highway State 92 - Hereford and the west line of the Southern Pacific Railroad right-of-way.	
	And that portion of the S½ of Sec. 15 lying west of Parcels 1, 2, and 3 of Survey Book 3, page 2 records of Cochise County, Arizona.	

FCSPRNCA0669

T. 23 S., R. 22 E. continued

Sec. 16,	Lots 1 and 2, S½SE¼;	186.68
Sec. 21,	SE¼;	160.00
Sec. 22,	Parcels 20, 21 and 22 of revised Survey Book 2, page 82, records of Cochise County, Arizona, and Parcels 6 through 11 of revised Survey Book 3, page 23, records of Cochise County, Arizona, and (1) That portion of the E½ of Sec. 22 lying between the east line of County Highway - State 92 - Hereford and the west line of the Southern Pacific Railroad's right-of-way; (2) and that portion of the SW¼ of Sec. 22, lying west of parcels 6, 8, and 10 of revised Survey Book 3, page 23, records of Cochise County, Arizona.	413.12
	Total Acreage Outside the San Juan de las Boquillas y Nogales and San Rafael del Valle Land Grants.	
	Total Acreage	9,358.65

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The San Juan de las Boquillas y Nogales Private Land Claim as more particularly described in Patent recorded January 18, 1901, in Book 14 of Real Estate Deeds, Page 280, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated, and maintained, described as follows:

(1) Beginning at the intersection of the centerline of the El Paso & Southwestern Railroad, and the south boundary of said San Juan de las Boquillas y Nogales Private Land Claim, said point of intersection being S. 79° 48' W., 4,886 feet, from Corner No. 8 of said Claim and being Station 221+85.7 as shown on Map of Relocation of the El Paso & Southwestern R.R. from Lewis Springs to Fairbanks, August 24, 1911, as filed in Bureau of Land Management Case File PHX 016320.

Thence northerly along said centerline to Station 252+00, the right-of-way for this distance shall have a uniform width of 100 feet on each side of said centerline described on said map of relocation;

Thence from Station 252+00, the right-of-way shall have a uniform width of 50 feet on each side of the said centerline, continue northerly along said centerline as described on said map of relocation to Station 555+96.9 and the end of survey described on said map of relocation;

Thence continue northerly from Station 555+96.9 equivalent to Station 0+00 the initial point of the centerline of railway herein to be described, said Station being located S. 26° 53' W., about 4,450 feet from corner No. 1 of said Claim, and running thence N. 27° 27' W., 3,500 feet, more or less, to a point 50 feet southerly at right angles from a tangent line projected easterly from the stem of the old wye pertaining to the New Mexico and Arizona Railroad Company. The right-of-way and yard limits embraced for said 3,500 feet of extension being a strip of land 100 feet in width upon the eastern side and a strip of land 100 feet in width upon the western side of said centerline;

Thence N. 27° 27' W., 820 feet, with an extension for right-of-way of 50 feet upon each side of said centerline;

Thence continuing said centerline N. 27° 27' W., 4,170 feet, with an extension on the western side of 50 feet in width, and extension on the eastern side of 100 feet in width at the southern end, and 200 feet in width at the northern end and all measured at right angles from said centerline;

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Thence continuing said centerline N. 27° 27' W., 660 feet, to Station 92+05, with extension upon each side of 100 feet in width;

Thence with curve to right of 1° 00' included angle 17° 07', 1,711.2 feet to Station 109+16.2, with extension upon each side of said curve of 80 feet in width;

Thence N. 10° 20' W., 775 feet, to Station 116+91.2, with extension upon each side of 80 feet in width;

Thence continuing said centerline course N. 10° 20' W. 8.1 feet to Station 116+99.3, with extensions upon each side of 50 feet in width;

Thence a strip of land 100 feet in width, 50 feet on each side of the centerline of a new connecting track between the mainline Tucson-Extension of El Paso & Southwestern Railroad Co., and the Benson Branch of said company as now constructed (November 18, 1914) upon said land and described as follows:

Beginning at Station 116+99.3 in the center of said main line track of said Tucson extension whence corner No. 1 of Boquillas Claim bears S. 46° 47' E., 9,400 feet;

Thence northerly to the right around a 5° 8' curve 92.7 feet;
Thence N. 5° 34' W., 21.2 feet;
Thence to the right around a 2° curve 116.6 feet;
Thence N. 3° 14' W., 2,702 feet;
Thence northerly to the left around a 5° 55' curve 390.1 feet to Station 900+34.4 in centerline of the El Paso & Southwestern Railroad as now constructed, operated and maintained.

(2) A strip of land 100 feet in width being 50 feet on each side of the centerline of the El Paso & Southwestern Railroad, as now constructed, operated, and maintained over, through, across and upon the tract of land known as the San Juan de las Boquillas y Nogales Private Land Claim said centerline beginning at a point on the northern end boundary line of said claim, distance 2,074.3 feet from the northwest corner of same and designated as Station 572+97 in centerline of survey for said El Paso & Southwestern Railroad, formerly Benson extension of the Arizona & Southwestern Railroad;

Thence S. 16° 41' E. to Station 585+68.2;
Thence with curve to left of 4°, included angle 20° 41' E. to Station 590+86;
Thence S. 37° 24' E. to Station 596+00;

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(2) continued

Thence with curve to right of 2°, included angle 8° 00' to Station 600+00;
Thence S. 29° 24' E., to Station 611+92;
Thence with curve to right of 6°, included angle 25° 45' to Station 616+21.2;
Thence S. 3° 39' E. to Station 622+70;
Thence with curve to right of 3°, included angle 18° 15' 29" to Station 628+78.6, equivalent to Station 0+00 of proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence S. 14° 36' 30" W., 2,161.9 feet to Station 21+61.9 of the proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence with curve to the right of 4°, included angle 18° 25' 55" to Station 26+22.7;
Thence S. 33° 02' 30" W., 1,124 feet to Station 37+46.7;
Thence with curve to the left of 2°, included angle 5° 27' 29" to Station 40+19.6; equivalent to Station 668+57.5, on the centerline of the El Paso & Southwestern Railroad, as now constructed, operated and maintained;
Thence S. 27° 35' W. to Station 685+70;
Thence with curve to left of 6°, included angle 28° 48' to Station 690+50;
Thence S. 1° 13' E. to Station 721+54.5;
Thence with curve to left of 6°, included angle 31° 56' to Engineer station 726+86.7;
Thence S. 33° 09' E. to Station 804+70.9;
Thence with curve to left of 4°, included angle 15° 04' to station 808+47.6;
Thence S. 48° 13' E. to Station 819+25;
Thence with curve to right of 2°, included angle 9° 00' to Station 823+75;
Thence S. 39° 13' E. to Station 827+42.3;
Thence with curve to right of 4°, included angle 32° 41' to Station 839+59.3;
Thence S. 6° 32' E. to Station 870+00 equivalent to 870+25.4;
Thence with curve to left of 8°, included angle 38° 21' to Station 875+04.8;
Thence S. 44° 53' E. to Station 882+87.7;
Thence with curve to right of 8°, included angle 24° 46' to Station 885+97.3;
Thence S. 20° 07' E. to Station 889+07.8;
Thence with curve to left of 6°, included angle 25° 24' to Station 893+31.1 equivalent to 893+33.4;
Thence S. 45° 31' E. to Station 894+00;
Thence with curve to right of 4°, included angle 15° 20' to Station 897+83.2;
Thence S. 30° 11' E. to Station 898+38.3;
Thence with curve to right of 2°, included angle 3° 55' 19" to Station 900+34.4, being the same Station 900+34.4 last called in (1) above.

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(B) Also, two strips of land for the purpose of excavating and maintaining a diagonal ditch for diversion of flood waters, the centerline of said strips of land and the dimensions of same being described as follows:

(1) Beginning at Station 670+57 in the centerline of the main railroad described in (A) above.

Thence N. 19° 05' W., 1,780 feet to foot of mesa, with a uniform width on the eastern side of said line of 40 feet, and a uniform width on the western side of said line of 60 feet, or total 100 feet in width.

(2) Also, beginning at the same Station 670+57, in main line:

Thence S. 72° 25' E., 133 feet;
Thence N. 64° 35' E. 517 feet to end of ditch with a uniform width upon each side of said line of 50 feet, or total 100 feet in width.

(C) The Rattler Patented Mine, Mineral Survey No. 553, Tombstone Mining District, Cochise County, Arizona.

(D) A strip of land 66 feet wide across the "Dean Richmond" Patented Mining Claim, situated in the San Juan de las Boquillas y Nogales Land Grant, the plat of said Patented Mining Claim, Mineral Survey No. 226, the centerline of said parcel being more particularly described as follows:

Commencing at the southeast corner of said Land Grant;

Thence N. 35° 38' 16" W., 3,799.78 feet to a point on the centerline of Charleston Road, said point being at the end of non-tangent curve, concave to the southeast;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of said "Dean Richmond" Patented Mining Claim, said point being the Point of Beginning of Segment 1;
Thence continuing N. 44° 41' 52" E., 491.93 feet to the Point of Terminus of Segment 1 on the north line of said Mining Claim;
Thence continuing N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Beginning of Segment 2 on the north line of said Mining Claim;

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(D) continued

Thence continuing, N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 05° 58' 17" for an arc distance of 165.77 feet to a Point of Terminus of Segment 2 on the east line of said Mining Claim.

(E) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follow: M.D.B. For BLM

Commencing at the ~~southeast~~ southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the S. line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E., said point also being the Point of Beginning;

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a Point of Terminus, said point being N. 79° 10' 14" E., 4,368.09 feet from the southwest corner of said Land Grant.

The length of the above described centerline is 249.40 feet, containing 0.38 acres, more or less.

(F) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follows:

Commencing at the southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the south line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E.;

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(F) continued

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a point of non-tangency with a local radial bearing of S. 13° 47' 06" E.;
Thence N. 23° 32' 55" E., 1,154.16 feet to the Point of Beginning of Segment 1;
Thence N. 27° 19' 52" E., 780.04 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 2,386.55 feet and a central angle of 27° 53' 50" for an arc distance of 1,162.01 feet to a point of tangency;
Thence N. 55° 13' 42" E., 354.44 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 5,391.13 feet and a central angle of 01° 03' 46" for an arc distance of 100.00 feet to a point of tangency;
Thence N. 54° 09' 56" E., 712.56 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 08° 15' 02" for an arc distance of 216.00 feet to a point of tangency;
Thence N. 62° 24' 58" E., 254.03 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 24° 18' 49" for an arc distance of 255.93 feet to a point of tangency;
Thence N. 38° 06' 09" E., 246.10 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 06° 35' 43" for an arc distance of 172.66 feet to a point of tangency;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of "Dean Richmond" Patented Mining Claim, Mineral Survey No. 226, as recorded with the Bureau of Land Management, said point being the Point of Terminus of Segment 1;
Thence N. 44° 41' 52" E., 491.93 feet to the Point of Beginning of Segment 2;
Thence N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Terminus of Segment 2;
Thence N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;

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(F) continued

Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 5° 58' 17" for an arc distance of 165.77 feet to the Point of Beginning of Segment 3;
Thence continuing along the arc of said curve, to the left, having a radius of 1,590.62 and a central angle of 6° 40' 39" for an arc distance of 185.38 feet to a point of non-tangency with a local radial bearing of N. 35° 42' 20" W., said point being the Point of Terminus of Segment 3, said point being S. 10° 00' 36" E., 1,234.13 feet along the easterly boundary of the San Juan de las Boquillas y Nogales Land Grant from the north closing corner of Section 1, Township 21 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. The length of Segment 1 is 4400.13 feet; the length of Segment 2 is 640.91 feet; the length of Segment 3 is 185.38 feet; the total length of the above described centerline is 5,226.42 feet.

The above parcel contains an area of 7.92 acres, more or less.

17,113.75

The San Rafael Del Valle Private Land Grant as more particularly described in Patent recorded November 21, 1903 in Book 23 of Real Estate Deeds, Page 140, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated and maintained, being all land first described in the deed dated April 15, 1911 from Green Cattle Company to El Paso and Southwestern Railroad Company, recorded in Book 52 of Real Estate Deeds, Page 351, Records of Cochise County.

(B) The easterly 50 feet thereof lying northerly of the northerly right-of-way line for State Highway Route 90 as it exists, December 1985, and southerly, on a line at 90° to the grant boundary, of the westerly line of Section 28, Township 21 South, Range 22 East, G&SRM;

(C) Beginning at the southeast corner of said land grant;

Thence N. 13° 29' W., coincident with the east line of said land grant, a distance of 1365.30 feet to a marked stone on the east boundary of said land grant;
Thence N. 45° 48' 54" W., a distance of 969.48 feet to the true point of beginning;
Thence N. 65° 28' 09" W., a distance of 807.04 feet to a point;

Exhibit A

FCSPRNCA0677

(C) continued

Thence S. 75° 53' 37" W., a distance of 1101.59 feet to a point;
Thence S. 19° 30' 35" E., a distance of 350.63 feet to a point;
Thence S. 18° 33' 06" E., a distance of 100.92 feet to a point;
Thence N. 83° 46' 36" E., a distance of 379.96 feet to a point;
Thence N. 64° 51' 44" E., a distance of 470.02 feet to a point;
Thence S. 85° 15' 25" E., a distance of 792.36 feet to a point;
Thence N. 18° 10' 24" E., a distance of 193.93 feet to the true point of beginning.

16,898.60

(D) That portion thereof lying southerly of the centerline of Hereford Road, as it exists December 1985, and westerly of the northerly prolongation of the centerline of Section 16, T. 23 S., R. 22 E., G&SRM.

Recap:	1.	Lands Outside Grants	9,358.65
	2.	San Juan de las Boquillas y Nogales Private Land Claim	17,113.75
	3.	San Rafael Del Valle Private Land Grant	16,898.60
			43,371.00

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MAR 10 1986 2PM
H-2 9.00

RECORDING REQUESTED BY

AND WHEN RECORDED MAIL TO

Name

Street Address

City & State

FEE # 860304871
OFFICIAL RECORDS
COCHISE COUNTY
DATE HOUR
03/10/86 2
REQUEST OF
TICOR TITLE INSURANCE CO.
CHRISTINE RHODES-RECORDER
FEE : 9.00 PAGES : 17

SPACE ABOVE THIS LINE FOR RECORDER'S USE

QUITCLAIM DEED

TENNECO WEST, INC., a Delaware corporation, does hereby remise, release and forever quitclaim unto the UNITED STATES OF AMERICA, its successors and assigns all its right, title and interest, if any, in and to all lands within the exterior boundaries of that certain real property located in the County of Cochise, State of Arizona, described in Exibit "A" attached hereto and incorporated herein by this reference together with all rights and privileges appurtenant thereto.

IN WITNESS WHEREOF, the undersigned, by its duly authorized officers has executed this Quitclaim Deed on this 7th day of March, 1986.

TENNECO WEST, INC. CORPORATE SEAL DELAWARE 1968

TENNECO WEST, INC.

By M. J. [illegible]
Senior Vice President

and by Wayne E. Broome
Assistant Secretary

STATE OF CALIFORNIA)
)ss.
COUNTY OF KERN)

On March 7, 1986, before me, the undersigned, a Notary Public in and for said State, personally appeared MELVIN JANS and WAYNE E. BROOME,

X personally known to me, or

___ proved to me on the basis of satisfactory evidence

to be the persons who executed the within instrument as Senior Vice President and Assistant Secretary, on behalf of TENNECO WEST, INC., the corporation therein named, and acknowledged to me that such corporation executed it pursuant to its by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

Carol A. Stringer
Signature

OFFICIAL SEAL
CAROL A. STRINGER
NOTARY PUBLIC - CALIFORNIA
BOND FILED IN
KERN COUNTY
My Commission Exp. Dec 5, 1988

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F827, 189-mw

FCSPRNCA0679

SAN PEDRO LANDS

COCHISE COUNTY, ARIZONA

GILA AND SALT RIVER MERIDIAN

T. 18 S., R. 20 E.

Sec. 24,	Parcels 1, 2, 3 and 4 of Survey Book 2, page 61, records of Cochise County, Arizona;	164.78

T. 18 S., R. 21 E.

Sec. 19,	Parcels 5 through 20 of Survey Book 2, page 61, records of Cochise County, AZ., and hereinafter amended per Survey Book 3, page 40 and 41;	632.30
Sec. 20,	Part of Parcel 8 in Sec. 19, above;	7.48
	Part of Parcel 12 in Sec. 19, above;	5.03
	E½ and all that portion of the NW¼ lying east of the easterly boundary of the Southern Pacific Transportation Company's right-of-way;	419.21
	EXCEPT the north 30 feet of the NW¼, (County Road) and,	
	EXCEPT the south 35.5 acres of that portion of the NW¼ lying west of the east line of the New Mexico and Arizona Railroad Company's right-of-way.	
Sec. 29,	NE¼, and that portion of the W½ lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way, and Parcels 34 and 35 of Amended Survey Book 3, page 42, records of Cochise Co., Arizona.	455.10

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T. 18 S., R. 21 E. (Continued)

Sec. 30,	Parcels 22 through 33 of Survey Book 2, page 61, records of Cochise County.	475.42
Sec. 32,	Those portions of Lots 3 and 6 lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way, and Parcels 37 and 38 of Survey Book 2, page 61, records of Cochise County.	99.58

T. 20 S., R. 21 E.

Sec. 16,	Lots 1-4, incl., W½NW¼, SW¼;	404.72
Sec. 21,	Lots 1-4, incl., SW¼SE¼;	198.36
Sec. 27,	Lot 1;	9.55
Sec. 28,	Lots 1-4, incl., W½E½;	300.90
Sec. 33,	E½;	320.00
Sec. 34,	Lots 1-4, incl.	102.40

T. 21 S., R. 21 E.

Sec. 3,	Lot 5, SW¼NE¼, S½NW¼;	142.08
Sec. 11,	Lots 3-6, incl., SE¼NW¼, S½NE¼, S½;	485.37

EXCEPT a strip of land 66 feet wide across Section 11, the centerline is more particularly described as follows:

Commencing at the southeast corner of said Section 11;

Thence S. 89° 48' 24" W., 2,136.05 feet along the south line of said Section 11 to the Point of beginning;
Thence N. 23° 40' 15" W. 389.16 feet to a point of curvature on a tangent curve, concave to the east;

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T. 21 S., R. 21 E. (Continued)

Thence northerly, along the arc of said curve, to the right, having a radius of 603.11 feet and a central angle of 66°43'40" for an arc distance of 702.39 feet to a point of tangency;
Thence N. 43° 03' 25" E., 307.34 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,032.54 and a central angle of 21° 14' 35" for an arc distance of 382.83 feet to a point of tangency;
Thence N. 21° 48' 50" E., 749.26 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 43° 09' 21" for an arc distance of 454.27 feet to a point of tangency;
Thence N. 21° 20' 31" W., 393.42 feet to point of curvature on a tangent curve, concave to the east;
Thence northerly, along the arc of said curve, having a radius of 603.11 feet and a central angle of 47° 15' 21", for an arc distance of 497.43 feet to a point of tangency;

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T. 21 S., R. 21 E. continued

Thence N. 25° 54' 50" E., 394.68 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1853.64 feet and a central angle of 02° 11' 19" for an arc distance of 70.81 feet to a point of non-tangency on the south line of Lot 2 of said Section 11, said point being the Point of Terminus;

Sec. 12,	NE¼SW¼, S½SW¼;	120.00
	EXCEPT from said NE¼SW¼, the following parcel as conveyed to El Paso Southwestern Railroad Company, an Arizona Corp., in Deed Recorded November 6, 1911, in Book 53 of Deeds of Real Estate, at page 220:	
	A strip of land approximately 200 feet in width, over, through, across and upon the said NE¼SE¼, lying and situate one hundred feet in width on either side of the center-line of survey for relocation of the El Paso and Southwestern Railroad between stations of Lewis Springs and Fairbanks as now surveyed and staked on the ground.	
Sec. 13,	SW¼NE¼, W½, W½SE¼, SE¼SE¼;	480.00
Sec. 14,	All;	629.50
	EXCEPT a strip of land 66 feet wide across Section 14, the centerline being more particularly described as follows:	

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T. 21 S., R. 21 E. continued

Commencing at the southwest corner of said Section 14;

Thence S. 89° 53' 47" E., 656.33 feet along the south line of said Section 14 to the Point of Beginning;
Thence N. 51° 27' 25" E., 1,353.52 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 9,276.72 feet and a central angle of 04° 27' 01" for an arc distance of 720.54 feet to a point of tangency;
Thence N. 55° 54' 26" E., 1,214.80 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve to the left, having a radius of 723.31 feet and a central angle of 38° 34' 12" for an arc distance of 486.91 feet to a point of tangency;
Thence N. 17° 20' 14" E., 983.95 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 41° 00' 29" for an arc distance of 431.66 feet to a point of tangency;
Thence N. 23° 40' 15" W., 1,741.49 feet to a point on the north line of said Section 14, said point being the Point of Terminus, said point being N. 89° 48' 24" E., 509.97 feet along said north line from the north quarter corner of said Section 14;

The length of the above described centerline is 6,932.87 feet, containing an area of 10.50 acres more or less.

Sec. 23, All; 638.69

EXCEPT a strip of land 66 feet wide across Section 23, the centerline being more particularly described as follows:

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T. 21 S., R. 21 E. continued

Commencing at the northwest corner of said Section 23;

Thence S. 00° 02' 11" E., 562.94 feet along the west line of said Section 23 to the Point of Beginning, said point being on a non-tangent curve with a local radial bearing of S. 42° 56' 18" E., concave to the southeast;

Thence northeasterly, along the arc of said curve, to the right, having a radius of 10,415.48 feet and a central angle of 04° 23' 43" for an arc distance of 798.99 feet to a point of tangency;

Thence N. 51° 27' 25" E., 64.88 feet to a point on the north line of said Section 23, said point being the Point of Terminus, said point being S. 89° 53' 47" east 656.33 feet from the northwest corner of said Section 23.

The length of the above centerline is 863.87 feet containing an area of 1.31 acres more or less.

Sec. 24,	All;	640.00
Sec. 25,	Lots 1-6, incl., NW¼NE¼, N½NW¼;	351.42
Sec. 26,	E½;	320.00
Sec. 36,	Lots 1-4, incl., SW¼NW¼, W½SW¼.	278.08

T. 22 S., R. 21 E.

Sec. 12,	SW¼NE¼, SW¼, NW¼SE¼;	240.00
Sec. 13,	NW¼NW¼;	40.00
Sec. 14,	NE¼NE¼.	40.00

T. 21 S., R. 22 E.

Sec. 7,	SE¼SW¼, SW¼SE¼;	80.00
Sec. 18,	NE¼NW¼.	40.00

Together with an easement for road purposes over and upon Lot 1 of said Section 18 described as follows:

FCSPRNCA0685

T. 21 S., R. 22 E. continued

(A) The south fifteen (15.00) feet thereof and

(B) A strip of land sixty (60.00) feet in width, the centerline being particularly described as follows:

Beginning at a point on the north line of said Section 18, said point being N. 89° 42' E., 813.64 feet from the northwest corner of said Section 18;

Thence S. 03° 34' E., 228.82 feet;
Thence S. 19° 53' W., 1,164.14 feet to a point on the south line of Lot 1 of said Section 18, said point being N. 89° 42' E., 431.94 feet from the southwest corner thereof.

T. 23 S., R. 22 E.

Sec. 14,	Parcels 12, 13, 15 through 19 inclusive of Survey Book 2, page 8, records of Cochise County, Arizona;	281.59
Sec. 15,	Parcels 1, 2, and 3 of Survey Book 2, page 8, records of Cochise County, Arizona,	197.29
	And that portion of the S½ of Sec. 15, lying between the east line of County Highway State 92 - Hereford and the west line of the Southern Pacific Railroad right-of-way.	
	And that portion of the S½ of Sec. 15 lying west of Parcels 1, 2, and 3 of Survey Book 3, page 2 records of Cochise County, Arizona.	

FCSPRNCA0686

T. 23 S., R. 22 E. continued

Sec. 16,	Lots 1 and 2, S½SE¼;	186.68
Sec. 21,	SE¼;	160.00
Sec. 22,	Parcels 20, 21 and 22 of revised Survey Book 2, page 82, records of Cochise County, Arizona, and Parcels 6 through 11 of revised Survey Book 3, page 23, records of Cochise County, Arizona, and (1) That portion of the E½ of Sec. 22 lying between the east line of County Highway - State 92 - Hereford and the west line of the Southern Pacific Railroad's right-of-way; (2) and that portion of the SW¼ of Sec. 22, lying west of parcels 6, 8, and 10 of revised Survey Book 3, page 23, records of Cochise County, Arizona. Total Acreage Outside the San Juan de las Boquillas y Nogales and San Rafael del Valle Land Grants.	413.12
	Total Acreage	9,358.65

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The San Juan de las Boquillas y Nogales Private Land Claim as more particularly described in Patent recorded January 18, 1901, in Book 14 of Real Estate Deeds, Page 280, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated, and maintained, described as follows:

(1) Beginning at the intersection of the centerline of the El Paso & Southwestern Railroad, and the south boundary of said San Juan de las Boquillas y Nogales Private Land Claim, said point of intersection being S. 79° 48' W., 4,886 feet, from Corner No. 8 of said Claim and being Station 221+85.7 as shown on Map of Relocation of the El Paso & Southwestern R.R. from Lewis Springs to Fairbanks, August 24, 1911, as filed in Bureau of Land Management Case File PHX 016320.

Thence northerly along said centerline to Station 252+00, the right-of-way for this distance shall have a uniform width of 100 feet on each side of said centerline described on said map of relocation;

Thence from Station 252+00, the right-of-way shall have a uniform width of 50 feet on each side of the said centerline, continue northerly along said centerline as described on said map of relocation to Station 555+96.9 and the end of survey described on said map of relocation;

Thence continue northerly from Station 555+96.9 equivalent to Station 0+00 the initial point of the centerline of railway herein to be described, said Station being located S. 26° 53' W., about 4,450 feet from corner No. 1 of said Claim, and running thence N. 27° 27' W., 3,500 feet, more or less, to a point 50 feet southerly at right angles from a tangent line projected easterly from the stem of the old wye pertaining to the New Mexico and Arizona Railroad Company. The right-of-way and yard limits embraced for said 3,500 feet of extension being a strip of land 100 feet in width upon the eastern side and a strip of land 100 feet in width upon the western side of said centerline;

Thence N. 27° 27' W., 820 feet, with an extension for right-of-way of 50 feet upon each side of said centerline;

Thence continuing said centerline N. 27° 27' W., 4,170 feet, with an extension on the western side of 50 feet in width, and extension on the eastern side of 100 feet in width at the southern end, and 200 feet in width at the northern end and all measured at right angles from said centerline;

860048?1

Exhibit A

FCSPRNCA0688

Thence continuing said centerline N. 27° 27' W., 660 feet, to Station 92+05, with extension upon each side of 100 feet in width;

Thence with curve to right of 1° 00' included angle 17° 07', 1,711.2 feet to Station 109+16.2, with extension upon each side of said curve of 80 feet in width;

Thence N. 10° 20' W., 775 feet, to Station 116+91.2, with extension upon each side of 80 feet in width;

Thence continuing said centerline course N. 10° 20' W. 8.1 feet to Station 116+99.3, with extensions upon each side of 50 feet in width;

Thence a strip of land 100 feet in width, 50 feet on each side of the centerline of a new connecting track between the mainline Tucson-Extension of El Paso & Southwestern Railroad Co., and the Benson Branch of said company as now constructed (November 18, 1914) upon said land and described as follows:

Beginning at Station 116+99.3 in the center of said main line track of said Tucson extension whence corner No. 1 of Boquillas Claim bears S. 46° 47' E., 9,400 feet;

Thence northerly to the right around a 5° 8' curve 92.7 feet;
Thence N. 5° 34' W., 21.2 feet;
Thence to the right around a 2° curve 116.6 feet;
Thence N. 3° 14' W., 2,702 feet;
Thence northerly to the left around a 5° 55' curve 390.1 feet to Station 900+34.4 in centerline of the El Paso & Southwestern Railroad as now constructed, operated and maintained.

(2) A strip of land 100 feet in width being 50 feet on each side of the centerline of the El Paso & Southwestern Railroad, as now constructed, operated, and maintained over, through, across and upon the tract of land known as the San Juan de las Boquillas y Nogales Private Land Claim said centerline beginning at a point on the northern end boundary line of said claim, distance 2,074.3 feet from the northwest corner of same and designated as Station 572+97 in centerline of survey for said El Paso & Southwestern Railroad, formerly Benson extension of the Arizona & Southwestern Railroad;

Thence S. 16° 41' E. to Station 585+68.2;
Thence with curve to left of 4°, included angle 20° 41' E. to Station 590+86;
Thence S. 37° 24' E. to Station 596+00;

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(2) continued

Thence with curve to right of 2°, included angle 8° 00' to Station 600+00;
Thence S. 29° 24' E., to Station 611+92;
Thence with curve to right of 6°, included angle 25° 45' to Station 616+21.2;
Thence S. 3° 39' E. to Station 622+70;
Thence with curve to right of 3°, included angle 18° 15' 29" to Station 628+78.6, equivalent to Station 0+00 of proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence S. 14° 36' 30" W., 2,161.9 feet to Station 21+61.9 of the proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence with curve to the right of 4°, included angle 18° 25' 55" to Station 26+22.7;
Thence S. 33° 02' 30" W., 1,124 feet to Station 37+46.7;
Thence with curve to the left of 2°, included angle 5° 27' 29" to Station 40+19.6; equivalent to Station 668+57.5, on the centerline of the El Paso & Southwestern Railroad, as now constructed, operated and maintained;
Thence S. 27° 35' W. to Station 685+70;
Thence with curve to left of 6°, included angle 28° 48' to Station 690+50;
Thence S. 1° 13' E. to Station 721+54.5;
Thence with curve to left of 6°, included angle 31° 56' to Engineer station 726+86.7;
Thence S. 33° 09' E. to Station 804+70.9;
Thence with curve to left of 4°, included angle 15° 04' to station 808+47.6;
Thence S. 48° 13' E. to Station 819+25;
Thence with curve to right of 2°, included angle 9° 00' to Station 823+75;
Thence S. 39° 13' E. to Station 827+42.3;
Thence with curve to right of 4°, included angle 32° 41' to Station 839+59.3;
Thence S. 6° 32' E. to Station 870+00 equivalent to 870+25.4;
Thence with curve to left of 8°, included angle 38° 21' to Station 875+04.8;
Thence S. 44° 53' E. to Station 882+87.7;
Thence with curve to right of 8°, included angle 24° 46' to Station 885+97.3;
Thence S. 20° 07' E. to Station 889+07.8;
Thence with curve to left of 6°, included angle 25° 24' to Station 893+31.1 equivalent to 893+33.4;
Thence S. 45° 31' E. to Station 894+00;
Thence with curve to right of 4°, included angle 15° 20' to Station 897+83.2;
Thence S. 30° 11' E. to Station 898+38.3;
Thence with curve to right of 2°, included angle 3° 55' 19" to Station 900+34.4, being the same Station 900+34.4 last called in (1) above.

FCSPRNCA0690

(B) Also, two strips of land for the purpose of excavating and maintaining a diagonal ditch for diversion of flood waters, the centerline of said strips of land and the dimensions of same being described as follows:

(1) Beginning at Station 670+57 in the centerline of the main railroad described in (A) above.

Thence N. 19° 05' W., 1,780 feet to foot of mesa, with a uniform width on the eastern side of said line of 40 feet, and a uniform width on the western side of said line of 60 feet, or total 100 feet in width.

(2) Also, beginning at the same Station 670+57, in main line:

Thence S. 72° 25' E., 133 feet;
Thence N. 64° 35' E. 517 feet to end of ditch with a uniform width upon each side of said line of 50 feet, or total 100 feet in width.

(C) The Rattler Patented Mine, Mineral Survey No. 553, Tombstone Mining District, Cochise County, Arizona.

(D) A strip of land 66 feet wide across the "Dean Richmond" Patented Mining Claim, situated in the San Juan de las Boquillas y Nogales Land Grant, the plat of said Patented Mining Claim, Mineral Survey No. 226, the centerline of said parcel being more particularly described as follows:

Commencing at the southeast corner of said Land Grant;

Thence N. 35° 38' 16" W., 3,799.78 feet to a point on the centerline of Charleston Road, said point being at the end of non-tangent curve, concave to the southeast;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of said "Dean Richmond" Patented Mining Claim, said point being the Point of Beginning of Segment 1;
Thence continuing N. 44° 41' 52" E., 491.93 feet to the Point of Terminus of Segment 1 on the north line of said Mining Claim;
Thence continuing N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Beginning of Segment 2 on the north line of said Mining Claim;

FCSPRNCA0691

(D) continued

Thence continuing, N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 05° 58' 17" for an arc distance of 165.77 feet to a Point of Terminus of Segment 2 on the east line of said Mining Claim.

(E) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follow:

Commencing at the ~~southeast~~ southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the S. line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E., said point also being the Point of Beginning;

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a Point of Terminus, said point being N. 79° 10' 14" E., 4,368.09 feet from the southwest corner of said Land Grant.

The length of the above described centerline is 249.40 feet, containing 0.38 acres, more or less.

(F) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follows:

Commencing at the southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the south line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E.;

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(F) continued

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a point of non-tangency with a local radial bearing of S. 13° 47' 06" E.;
Thence N. 23° 32' 55" E., 1,154.16 feet to the Point of Beginning of Segment 1;
Thence N. 27° 19' 52" E., 780.04 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 2,386.55 feet and a central angle of 27° 53' 50" for an arc distance of 1,162.01 feet to a point of tangency;
Thence N. 55° 13' 42" E., 354.44 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 5,391.13 feet and a central angle of 01° 03' 46" for an arc distance of 100.00 feet to a point of tangency;
Thence N. 54° 09' 56" E., 712.56 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 08° 15' 02" for an arc distance of 216.00 feet to a point of tangency;
Thence N. 62° 24' 58" E., 254.03 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 24° 18' 49" for an arc distance of 255.93 feet to a point of tangency;
Thence N. 38° 06' 09" E., 246.10 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 06° 35' 43" for an arc distance of 172.66 feet to a point of tangency;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of "Dean Richmond" Patented Mining Claim, Mineral Survey No. 226, as recorded with the Bureau of Land Management, said point being the Point of Terminus of Segment 1;
Thence N. 44° 41' 52" E., 491.93 feet to the Point of Beginning of Segment 2;
Thence N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Terminus of Segment 2;
Thence N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;

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(F) continued

Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 5° 58' 17" for an arc distance of 165.77 feet to the Point of Beginning of Segment 3;
Thence continuing along the arc of said curve, to the left, having a radius of 1,590.62 and a central angle of 6° 40' 39" for an arc distance of 185.38 feet to a point of non-tangency with a local radial bearing of N. 35° 42' 20" W., said point being the Point of Terminus of Segment 3, said point being S. 10° 00' 36" E., 1,234.13 feet along the easterly boundary of the San Juan de las Boquillas y Nogales Land Grant from the north closing corner of Section 1, Township 21 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. The length of Segment 1 is 4400.13 feet; the length of Segment 2 is 640.91 feet; the length of Segment 3 is 185.38 feet; the total length of the above described centerline is 5,226.42 feet.

The above parcel contains an area of 7.92 acres, more or less.

17,113.75

The San Rafael Del Valle Private Land Grant as more particularly described in Patent recorded November 21, 1903 in Book 23 of Real Estate Deeds, Page 140, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated and maintained, being all land first described in the deed dated April 15, 1911 from Green Cattle Company to El Paso and Southwestern Railroad Company, recorded in Book 52 of Real Estate Deeds, Page 351, Records of Cochise County.

(B) The easterly 50 feet thereof lying northerly of the northerly right-of-way line for State Highway Route 90 as it exists, December 1985, and southerly, on a line at 90° to the grant boundary, of the westerly line of Section 28, Township 21 South, Range 22 East, G&SRM;

(C) Beginning at the southeast corner of said land grant;

Thence N. 13° 29' W., coincident with the east line of said land grant, a distance of 1365.30 feet to a marked stone on the east boundary of said land grant;
Thence N. 45° 48' 54" W., a distance of 969.48 feet to the true point of beginning;
Thence N. 65° 28' 09" W., a distance of 807.04 feet to a point;

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(C) continued

Thence S. 75° 53' 37" W., a distance of 1101.59 feet to a point;
Thence S. 19° 30' 35" E., a distance of 350.63 feet to a point;
Thence S. 18° 33' 06" E., a distance of 100.92 feet to a point;
Thence N. 83° 46' 36" E., a distance of 379.96 feet to a point;
Thence N. 64° 51' 44" E., a distance of 470.02 feet to a point;
Thence S. 85° 15' 25" E., a distance of 792.36 feet to a point;
Thence N. 18° 10' 24" E., a distance of 193.93 feet to the true point of beginning.

16,898.60

(D) That portion thereof lying southerly of the centerline of Hereford Road, as it exists December 1985, and westerly of the northerly prolongation of the centerline of Section 16, T. 23 S., R. 22 E., G&SRM.

Recap:	1.	Lands Outside Grants	9,358.65
	2.	San Juan de las Boquillas y Nogales Private Land Claim	17,113.75
	3.	San Rafael Del Valle Private Land Grant	16,898.60
			43,371.00

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MAR 7 1986 12PM 2
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QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS:

For value received, and in accordance with the Act of October 21, 1976 (90 Stat. 2743), ARIZONA WHITE TANK ASSOCIATES, Grantor herein, does quitclaim unto the UNITED STATES OF AMERICA, its successors and assigns forever, all the right, title and interests, if any, of ARIZONA WHITE TANK ASSOCIATES in the mineral, water and other interests to that certain real property located in the County of Cochise, State of Arizona, described in Exhibit "A" attached hereto and incorporated herein by this reference together with all rights and privileges appurtenant thereto.

IN WITNESS WHEREOF, Grantor has caused these presents to be executed on this 6 day of March, 1986.

ARIZONA WHITE TANKS ASSOCIATES, an Arizona General Partnership
H. B. BELL (WHITE TANK) INC., General Partner

By _____
President

State of Arizona)
) ss
County of Maricopa)

The foregoing instrument was acknowledged before me this 6 day of March, 1986, by H. B. Bell, President, H. B. Bell (White Tank) Inc., an Arizona corporation, partner on behalf of Arizona White Tank Associates, an Arizona General Partnership.

_____
Notary Public

FEE # 860304728
OFFICIAL RECORDS
COCHISE COUNTY
DATE HOUR
03/07/86 12
REQUEST OF
TICOR TITLE INSURANCE CO.
CHRISTINE RHODES-RECORDER
FEE : 9.00 PAGES : 17

86004728

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SAN PEDRO LANDS

COCHISE COUNTY, ARIZONA

GILA AND SALT RIVER MERIDIAN

T. 18 S., R. 20 E.

Sec. 24,	Parcels 1, 2, 3 and 4 of Survey Book 2, page 61, records of Cochise County, Arizona;	164.78

T. 18 S., R. 21 E.

Sec. 19,	Parcels 5 through 20 of Survey Book 2, page 61, records of Cochise County, AZ., and hereinafter amended per Survey Book 3, page 40 and 41;	632.30
Sec. 20,	Part of Parcel 8 in Sec. 19, above;	7.48
	Part of Parcel 12 in Sec. 19, above;	5.03
	E½ and all that portion of the NW¼ lying east of the easterly boundary of the Southern Pacific Transportation Company's right-of-way;	419.21
	EXCEPT the north 30 feet of the NW¼, (County Road) and,	
	EXCEPT the south 35.5 acres of that portion of the NW¼ lying west of the east line of the New Mexico and Arizona Railroad Company's right-of-way.	
Sec. 29,	NE¼, and that portion of the W½ lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way, and Parcels 34 and 35 of Amended Survey Book 3, page 42, records of Cochise Co., Arizona.	455.10

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T. 18 S., R. 21 E. (Continued)

Sec. 30,	Parcels 22 through 33 of Survey Book 2, page 61, records of Cochise County.	475.42
Sec. 32,	Those portions of Lots 3 and 6 lying east of the easterly boundary of Southern Pacific Railroad Company's right-of-way,	99.58
	and	
	Parcels 37 and 38 of Survey Book 2, page 61, records of Cochise County.	

T. 20 S., R. 21 E.

Sec. 16,	Lots 1-4, incl., W½NW¼, SW¼;	404.72
Sec. 21,	Lots 1-4, incl., SW¼SE¼;	198.36
Sec. 27,	Lot 1;	9.55
Sec. 28,	Lots 1-4, incl., W½E½;	300.90
Sec. 33,	E½;	320.00
Sec. 34,	Lots 1-4, incl.	102.40

T. 21 S., R. 21 E.

Sec. 3,	Lot 5, SW¼NE¼, S½NW¼;	142.08
Sec. 11,	Lots 3-6, incl., SE¼NW¼, S½NE¼, S½;	485.37
	EXCEPT a strip of land 66 feet wide across Section 11, the centerline is more particularly described as follows:	
	Commencing at the southeast corner of said Section 11;	
	Thence S. 89° 48' 24" W., 2,136.05 feet along the south line of said Section 11 to the Point of beginning;	
	Thence N. 23° 40' 15" W. 389.16 feet to a point of curvature on a tangent curve, concave to the east;	

Exhibit A
Page 2

86004728

FCSPRNCA0698

T. 21 S., R. 21 E. (Continued)

Thence northerly, along the arc of said curve, to the right, having a radius of 603.11 feet and a central angle of 66°43'40" for an arc distance of 702.39 feet to a point of tangency;
Thence N. 43° 03' 25" E., 307.34 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,032.54 and a central angle of 21° 14' 35" for an arc distance of 382.83 feet to a point of tangency;
Thence N. 21° 48' 50" E., 749.26 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 43° 09' 21" for an arc distance of 454.27 feet to a point of tangency;
Thence N. 21° 20' 31" W., 393.42 feet to point of curvature on a tangent curve, concave to the east;
Thence northerly, along the arc of said curve, having a radius of 603.11 feet and a central angle of 47° 15' 21", for an arc distance of 497.43 feet to a point of tangency;

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T. 21 S., R. 21 E. continued

Thence N. 25° 54' 50" E., 394.68 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1853.64 feet and a central angle of 02° 11' 19" for an arc distance of 70.81 feet to a point of non-tangency on the south line of Lot 2 of said Section 11, said point being the Point of Terminus;

Sec. 12,	NE¼SW¼, S½SW¼;	120.00
	EXCEPT from said NE¼SW¼, the following parcel as conveyed to El Paso Southwestern Railroad Company, an Arizona Corp., in Deed Recorded November 6, 1911, in Book 53 of Deeds of Real Estate, at page 220:	
	A strip of land approximately 200 feet in width, over, through, across and upon the said NE¼SE¼, lying and situate one hundred feet in width on either side of the center-line of survey for relocation of the El Paso and Southwestern Railroad between stations of Lewis Springs and Fairbanks as now surveyed and staked on the ground.	
Sec. 13,	SW¼NE¼, W½, W½SE¼, SE¼SE¼;	480.00
Sec. 14,	All;	629.50
	EXCEPT a strip of land 66 feet wide across Section 14, the centerline being more particularly described as follows:	

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T. 21 S., R. 21 E. continued

Commencing at the southwest corner of said Section 14;

Thence S. 89° 53' 47" E., 656.33 feet along the south line of said Section 14 to the Point of Beginning;
Thence N. 51° 27' 25" E., 1,353.52 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 9,276.72 feet and a central angle of 04° 27' 01" for an arc distance of 720.54 feet to a point of tangency;
Thence N. 55° 54' 26" E., 1,214.80 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve to the left, having a radius of 723.31 feet and a central angle of 38° 34' 12" for an arc distance of 486.91 feet to a point of tangency;
Thence N. 17° 20' 14" E., 983.95 feet to a point of curvature on a tangent curve, concave to the west;
Thence northerly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 41° 00' 29" for an arc distance of 431.66 feet to a point of tangency;
Thence N. 23° 40' 15" W., 1,741.49 feet to a point on the north line of said Section 14, said point being the Point of Terminus, said point being N. 89° 48' 24" E., 509.97 feet along said north line from the north quarter corner of said Section 14;

The length of the above described centerline is 6,932.87 feet, containing an area of 10.50 acres more or less.

Sec. 23, All; 638.69

EXCEPT a strip of land 66 feet wide across Section 23, the centerline being more particularly described as follows:

FCSPRNCA0701

T. 21 S., R. 21 E. continued

Commencing at the northwest corner of said Section 23;

Thence S. 00° 02' 11" E., 562.94 feet along the west line of said Section 23 to the Point of Beginning, said point being on a non-tangent curve with a local radial bearing of S. 42° 56' 18" E., concave to the southeast;

Thence northeasterly, along the arc of said curve, to the right, having a radius of 10,415.48 feet and a central angle of 04° 23' 43" for an arc distance of 798.99 feet to a point of tangency;

Thence N. 51° 27' 25" E., 64.88 feet to a point on the north line of said Section 23, said point being the Point of Terminus, said point being S. 89° 53' 47" east 656.33 feet from the northwest corner of said Section 23.

The length of the above centerline is 863.87 feet containing an area of 1.31 acres more or less.

Sec. 24,	All;	640.00
Sec. 25,	Lots 1-6, incl., NW¼NE¼, N½NW¼;	351.42
Sec. 26,	E½;	320.00
Sec. 36,	Lots 1-4, incl., SW¼NW¼, W½SW¼.	278.08

T. 22 S., R. 21 E.

Sec. 12,	SW¼NE¼, SW¼, NW¼SE¼;	240.00
Sec. 13,	NW¼NW¼;	40.00
Sec. 14,	NE¼NE¼.	40.00

T. 21 S., R. 22 E.

Sec. 7,	SE¼SW¼, SW¼SE¼;	80.00
Sec. 18,	NE¼NW¼.	40.00

Together with an easement for road purposes over and upon Lot 1 of said Section 18 described as follows:

FCSPRNCA0702

T. 21 S., R. 22 E. continued

(A) The south fifteen (15.00) feet thereof and

(B) A strip of land sixty (60.00) feet in width, the centerline being particularly described as follows:

Beginning at a point on the north line of said Section 18, said point being N. 89° 42' E., 813.64 feet from the northwest corner of said Section 18;

Thence S. 03° 34' E., 228.82 feet;
Thence S. 19° 53' W., 1,164.14 feet to a point on the south line of Lot 1 of said Section 18, said point being N. 89° 42' E., 431.94 feet from the southwest corner thereof.

T. 23 S., R. 22 E.

Sec. 14,	Parcels 12, 13, 15 through 19 inclusive of Survey Book 2, page 8, records of Cochise County, Arizona;	281.59
Sec. 15,	Parcels 1, 2, and 3 of Survey Book 2, page 8, records of Cochise County, Arizona,	197.29
	And that portion of the S½ of Sec. 15, lying between the east line of County Highway State 92 - Hereford and the west line of the Southern Pacific Railroad right-of-way.	
	And that portion of the S½ of Sec. 15 lying west of Parcels 1, 2, and 3 of Survey Book 3, page 2 records of Cochise County, Arizona.	

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T. 23 S., R. 22 E. continued

Sec. 16,	Lots 1 and 2, S½SE¼;	186.68
Sec. 21,	SE¼;	160.00
Sec. 22,	Parcels 20, 21 and 22 of revised Survey Book 2, page 82, records of Cochise County, Arizona, and	413.12
	Parcels 6 through 11 of revised Survey Book 3, page 23, records of Cochise County, Arizona, and	
	(1) That portion of the E½ of Sec. 22 lying between the east line of County Highway - State 92 - Hereford and the west line of the Southern Pacific Railroad's right-of-way; (2) and that portion of the SW¼ of Sec. 22, lying west of parcels 6, 8, and 10 of revised Survey Book 3, page 23, records of Cochise County, Arizona.	
	Total Acreage Outside the San Juan de las Boquillas y Nogales and San Rafael del Valle Land Grants.	
	Total Acreage	9,358.65

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The San Juan de las Boquillas y Nogales Private Land Claim as more particularly described in Patent recorded January 18, 1901, in Book 14 of Real Estate Deeds, Page 280, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated, and maintained, described as follows:

(1) Beginning at the intersection of the centerline of the El Paso & Southwestern Railroad, and the south boundary of said San Juan de las Boquillas y Nogales Private Land Claim, said point of intersection being S. 79° 48' W., 4,886 feet, from Corner No. 8 of said Claim and being Station 221+85.7 as shown on Map of Relocation of the El Paso & Southwestern R.R. from Lewis Springs to Fairbanks, August 24, 1911, as filed in Bureau of Land Management Case File PHX 016320.

Thence northerly along said centerline to Station 252+00, the right-of-way for this distance shall have a uniform width of 100 feet on each side of said centerline described on said map of relocation;

Thence from Station 252+00, the right-of-way shall have a uniform width of 50 feet on each side of the said centerline, continue northerly along said centerline as described on said map of relocation to Station 555+96.9 and the end of survey described on said map of relocation;

Thence continue northerly from Station 555+96.9 equivalent to Station 0+00 the initial point of the centerline of railway herein to be described, said Station being located S. 26° 53' W., about 4,450 feet from corner No. 1 of said Claim, and running thence N. 27° 27' W., 3,500 feet, more or less, to a point 50 feet southerly at right angles from a tangent line projected easterly from the stem of the old wye pertaining to the New Mexico and Arizona Railroad Company. The right-of-way and yard limits embraced for said 3,500 feet of extension being a strip of land 100 feet in width upon the eastern side and a strip of land 100 feet in width upon the western side of said centerline;

Thence N. 27° 27' W., 820 feet, with an extension for right-of-way of 50 feet upon each side of said centerline;

Thence continuing said centerline N. 27° 27' W., 4,170 feet, with an extension on the western side of 50 feet in width, and extension on the eastern side of 100 feet in width at the southern end, and 200 feet in width at the northern end and all measured at right angles from said centerline;

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Thence continuing said centerline N. 27° 27' W., 660 feet, to Station 92+05, with extension upon each side of 100 feet in width;

Thence with curve to right of 1° 00' included angle 17° 07', 1,711.2 feet to Station 109+16.2, with extension upon each side of said curve of 80 feet in width;

Thence N. 10° 20' W., 775 feet, to Station 116+91.2, with extension upon each side of 80 feet in width;

Thence continuing said centerline course N. 10° 20' W. 8.1 feet to Station 116+99.3, with extensions upon each side of 50 feet in width;

Thence a strip of land 100 feet in width, 50 feet on each side of the centerline of a new connecting track between the mainline Tucson-Extension of El Paso & Southwestern Railroad Co., and the Benson Branch of said company as now constructed (November 18, 1914) upon said land and described as follows:

Beginning at Station 116+99.3 in the center of said main line track of said Tucson extension whence corner No. 1 of Boquillas Claim bears S. 46° 47' E., 9,400 feet;

Thence northerly to the right around a 5° 8' curve 92.7 feet;
Thence N. 5° 34' W., 21.2 feet;
Thence to the right around a 2° curve 116.6 feet;
Thence N. 3° 14' W., 2,702 feet;
Thence northerly to the left around a 5° 55' curve 390.1 feet to Station 900+34.4 in centerline of the El Paso & Southwestern Railroad as now constructed, operated and maintained.

(2) A strip of land 100 feet in width being 50 feet on each side of the centerline of the El Paso & Southwestern Railroad, as now constructed, operated, and maintained over, through, across and upon the tract of land known as the San Juan de las Boquillas y Nogales Private Land Claim said centerline beginning at a point on the northern end boundary line of said claim, distance 2,074.3 feet from the northwest corner of same and designated as Station 572+97 in centerline of survey for said El Paso & Southwestern Railroad, formerly Benson extension of the Arizona & Southwestern Railroad;

Thence S. 16° 41' E. to Station 585+68.2;
Thence with curve to left of 4°, included angle 20° 41' E. to Station 590+86;
Thence S. 37° 24' E. to Station 596+00;

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(2) continued

Thence with curve to right of 2°, included angle 8° 00' to Station 600+00;
Thence S. 29° 24' E., to Station 611+92;
Thence with curve to right of 6°, included angle 25° 45' to Station 616+21.2;
Thence S. 3° 39' E. to Station 622+70;
Thence with curve to right of 3°, included angle 18° 15' 29" to Station 628+78.6, equivalent to Station 0+00 of proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence S. 14° 36' 30" W., 2,161.9 feet to Station 21+61.9 of the proposed change of line of said Benson Branch as surveyed on January 11, 1919;
Thence with curve to the right of 4°, included angle 18° 25' 55" to Station 26+22.7;
Thence S. 33° 02' 30" W., 1,124 feet to Station 37+46.7;
Thence with curve to the left of 2°, included angle 5° 27' 29" to Station 40+19.6; equivalent to Station 668+57.5, on the centerline of the El Paso & Southwestern Railroad, as now constructed, operated and maintained;
Thence S. 27° 35' W. to Station 685+70;
Thence with curve to left of 6°, included angle 28° 48' to Station 690+50;
Thence S. 1° 13' E. to Station 721+54.5;
Thence with curve to left of 6°, included angle 31° 56' to Engineer station 726+86.7;
Thence S. 33° 09' E. to Station 804+70.9;
Thence with curve to left of 4°, included angle 15° 04' to station 808+47.6;
Thence S. 48° 13' E. to Station 819+25;
Thence with curve to right of 2°, included angle 9° 00' to Station 823+75;
Thence S. 39° 13' E. to Station 827+42.3;
Thence with curve to right of 4°, included angle 32° 41' to Station 839+59.3;
Thence S. 6° 32' E. to Station 870+00 equivalent to 870+25.4;
Thence with curve to left of 8°, included angle 38° 21' to Station 875+04.8;
Thence S. 44° 53' E. to Station 882+87.7;
Thence with curve to right of 8°, included angle 24° 46' to Station 885+97.3;
Thence S. 20° 07' E. to Station 889+07.8;
Thence with curve to left of 6°, included angle 25° 24' to Station 893+31.1 equivalent to 893+33.4;
Thence S. 45° 31' E. to Station 894+00;
Thence with curve to right of 4°, included angle 15° 20' to Station 897+83.2;
Thence S. 30° 11' E. to Station 898+38.3;
Thence with curve to right of 2°, included angle 3° 55' 19" to Station 900+34.4, being the same Station 900+34.4 last called in (1) above.

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(B) Also, two strips of land for the purpose of excavating and maintaining a diagonal ditch for diversion of flood waters, the centerline of said strips of land and the dimensions of same being described as follows:

(1) Beginning at Station 670+57 in the centerline of the main railroad described in (A) above.

Thence N. 19° 05' W., 1,780 feet to foot of mesa, with a uniform width on the eastern side of said line of 40 feet, and a uniform width on the western side of said line of 60 feet, or total 100 feet in width.

(2) Also, beginning at the same Station 670+57, in main line:

Thence S. 72° 25' E., 133 feet;
Thence N. 64° 35' E. 517 feet to end of ditch with a uniform width upon each side of said line of 50 feet, or total 100 feet in width.

(C) The Rattler Patented Mine, Mineral Survey No. 553, Tombstone Mining District, Cochise County, Arizona.

(D) A strip of land 66 feet wide across the "Dean Richmond" Patented Mining Claim, situated in the San Juan de las Boquillas y Nogales Land Grant, the plat of said Patented Mining Claim, Mineral Survey No. 226, the centerline of said parcel being more particularly described as follows:

Commencing at the southeast corner of said Land Grant;

Thence N. 35° 38' 16" W., 3,799.78 feet to a point on the centerline of Charleston Road, said point being at the end of non-tangent curve, concave to the southeast;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of said "Dean Richmond" Patented Mining Claim, said point being the Point of Beginning of Segment 1;
Thence continuing N. 44° 41' 52" E., 491.93 feet to the Point of Terminus of Segment 1 on the north line of said Mining Claim;
Thence continuing N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Beginning of Segment 2 on the north line of said Mining Claim;

FCSPRNCA0708

(D) continued

Thence continuing, N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 05° 58' 17" for an arc distance of 165.77 feet to a Point of Terminus of Segment 2 on the east line of said Mining Claim.

(E) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follow: M.O.B. FOR BLM

Commencing at the ~~southeast~~ southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the S. line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E., said point also being the Point of Beginning;

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a Point of Terminus, said point being N. 79° 10' 14" E., 4,368.09 feet from the southwest corner of said Land Grant.

The length of the above described centerline is 249.40 feet, containing 0.38 acres, more or less.

(F) A strip of land 66 feet wide across the San Juan de las Boquillas y Nogales Land Grant, the centerline being more particularly described as follows:

Commencing at the southwest corner of said Land Grant;

Thence N. 80° 02' 54" E., 4,129.17 feet along the south line of said Land Grant to a point on a non-tangent curve to the right with a radius of 603.11 feet, said curve being concave to the southeast and having a local radial bearing of S. 37° 28' 42" E.;

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(F) continued

Thence through a central angle of 23° 41' 36", 249.40 feet along the arc of said curve to a point of non-tangency with a local radial bearing of S. 13° 47' 06" E.;
Thence N. 23° 32' 55" E., 1,154.16 feet to the Point of Beginning of Segment 1;
Thence N. 27° 19' 52" E., 780.04 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 2,386.55 feet and a central angle of 27° 53' 50" for an arc distance of 1,162.01 feet to a point of tangency;
Thence N. 55° 13' 42" E., 354.44 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 5,391.13 feet and a central angle of 01° 03' 46" for an arc distance of 100.00 feet to a point of tangency;
Thence N. 54° 09' 56" E., 712.56 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 08° 15' 02" for an arc distance of 216.00 feet to a point of tangency;
Thence N. 62° 24' 58" E., 254.03 feet to a point of curvature on a tangent curve, concave to the northwest;
Thence northeasterly, along the arc of said curve, to the left, having a radius of 603.11 feet and a central angle of 24° 18' 49" for an arc distance of 255.93 feet to a point of tangency;
Thence N. 38° 06' 09" E., 246.10 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 1,500.00 feet and a central angle of 06° 35' 43" for an arc distance of 172.66 feet to a point of tangency;
Thence N. 44° 41' 52" E., 146.36 feet to a point on the west line of "Dean Richmond" Patented Mining Claim, Mineral Survey No. 226, as recorded with the Bureau of Land Management, said point being the Point of Terminus of Segment 1;
Thence N. 44° 41' 52" E., 491.93 feet to the Point of Beginning of Segment 2;
Thence N. 44° 41' 52" E., 75.97 feet to a point of curvature on a tangent curve, concave to the southeast;
Thence northeasterly, along the arc of said curve, to the right, having a radius of 869.80 feet and a central angle of 22° 14' 44" for an arc distance of 337.71 feet to a point of tangency;
Thence N. 66° 56' 36" E., 227.23 feet to the Point of Terminus of Segment 2;
Thence N. 66° 56' 36" E., 207.73 feet to a point of curvature on a tangent curve, concave to the northwest;

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(F) continued

Thence northeasterly, along the arc of said curve, to the left, having a radius of 1,590.62 feet and a central angle of 5° 58' 17" for an arc distance of 165.77 feet to the Point of Beginning of Segment 3;
Thence continuing along the arc of said curve, to the left, having a radius of 1,590.62 and a central angle of 6° 40' 39" for an arc distance of 185.38 feet to a point of non-tangency with a local radial bearing of N. 35° 42' 20" W., said point being the Point of Terminus of Segment 3, said point being S. 10° 00' 36" E., 1,234.13 feet along the easterly boundary of the San Juan de las Boquillas y Nogales Land Grant from the north closing corner of Section 1, Township 21 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. The length of Segment 1 is 4400.13 feet; the length of Segment 2 is 640.91 feet; the length of Segment 3 is 185.38 feet; the total length of the above described centerline is 5,226.42 feet.

The above parcel contains an area of 7.92 acres, more or less.

17,113.75

The San Rafael Del Valle Private Land Grant as more particularly described in Patent recorded November 21, 1903 in Book 23 of Real Estate Deeds, Page 140, Records of Cochise County.

Except

(A) A strip of land for the railroad as presently constructed, operated and maintained, being all land first described in the deed dated April 15, 1911 from Green Cattle Company to El Paso and Southwestern Railroad Company, recorded in Book 52 of Real Estate Deeds, Page 351, Records of Cochise County.

(B) The easterly 50 feet thereof lying northerly of the northerly right-of-way line for State Highway Route 90 as it exists, December 1985, and southerly, on a line at 90° to the grant boundary, of the westerly line of Section 28, Township 21 South, Range 22 East, G&SRM;

(C) Beginning at the southeast corner of said land grant;

Thence N. 13° 29' W., coincident with the east line of said land grant, a distance of 1365.30 feet to a marked stone on the east boundary of said land grant;
Thence N. 45° 48' 54" W., a distance of 969.48 feet to the true point of beginning;
Thence N. 65° 28' 09" W., a distance of 807.04 feet to a point;

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(C) continued

Thence S. 75° 53' 37" W., a distance of 1101.59 feet to a point;
Thence S. 19° 30' 35" E., a distance of 350.63 feet to a point;
Thence S. 18° 33' 06" E., a distance of 100.92 feet to a point;
Thence N. 83° 46' 36" E., a distance of 379.96 feet to a point;
Thence N. 64° 51' 44" E., a distance of 470.02 feet to a point;
Thence S. 85° 15' 25" E., a distance of 792.36 feet to a point;
Thence N. 18° 10' 24" E., a distance of 193.93 feet to the true point of beginning.

16,898.60

(D) That portion thereof lying southerly of the centerline of Hereford Road, as it exists December 1985, and westerly of the northerly prolongation of the centerline of Section 16, T. 23 S., R. 22 E., G&SRM.

Recap:	1.	Lands Outside Grants	9,358.65
	2.	San Juan de las Boquillas y Nogales Private Land Claim	17,113.75
	3.	San Rafael Del Valle Private Land Grant	16,898.60
			43,371.00

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Recorded at the request of

When recorded, mail to:

BUREAU OF LAND MANAGEMENT
425 E. 4TH STREET
SAFFORD, AZ. 85546
ATTN: C.F. HOUGLAND

FEE # 880203259
OFFICIAL RECORDS
COCHISE COUNTY
DATE HOUR
02/17/88 1

REQUEST OF
BUREAU OF LAND MANAGEMENT
CHRISTINE RHODES-RECORDER
FEE : 4.00 PAGES : 3

FEB 17 1988 1PM.
P-1
3.00

QUIT-CLAIM DEED

For the consideration of Ten Dollars, and other valuable considerations, I or we, TENNECO WEST, INC., A DELAWARE CORPORATION

hereby quit-claim to THE UNITED STATES OF AMERICA, ITS SUCCESSORS AND ASSIGNS

all right, title, or interest in the following real property located in COCHISE County, Arizona:

SEE EXHIBIT "A" ATTACHED HERE TO:

NOTE: IT IS THE INTENT OF THIS DEED TO CLEAR ANY AMBIGUITIES THAT MAY APPEAR IN THE DESCRIPTIONS OF PARCELS II, III, IV,VI,VII, AND VIII SET FORTH IN THOSE CERTAIN DEEDS RECORDED AT FEE # 8603-04725 AND AT FEE # 8603-04726 BETWEEN TENNECO WEST, INC. AND ARIZONA WHITE TANK ASSOCIATES, an Arizona General Partnership,

Dated: JANUARY 11, , 19 88

TENNECO WEST, INC.

By Senior Vice President

and by Assistant Secretary

STATE OF CALIFORNIA
County of KERN } ss.

Acknowledged before me on , 19 , by

Notary Public

My commission will expire:

STATE OF
County of } ss.

Acknowledged before me on , 19 , by

Notary Public

My commission will expire:

NOTE: The parties are cautioned that by completing and executing this document, legal rights, duties and obligations are created. By signing, the parties acknowledge that they have been advised to seek and obtain independent legal counsel as to all matters contained in the within document prior to signing same and that said parties have obtained advice or choose to proceed without same.

DO-5 (AZ) 6-83

TICOR TITLE INSURANCE

FCSPRNCA0713

STATE OF CALIFORNIA)
COUNTY OF KERN)ss.

On February 8, 1988, before me, the undersigned, a Notary Public in and for said State, personally appeared Melvin Jans and Wayne E. Broome, personally known to me (or proved to me on the basis of satisfactory evidence) to be the persons who executed the within instrument as Senior Vice President and Assistant Secretary, on behalf of TENNECO WEST, INC., the corporation therein named, and acknowledged to me that such corporation executed it pursuant to its by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

Dana A. Kerby
Signature

OFFICIAL SEAL
DANA A. KERBY
Notary Public-California
Principal Office In
Kern County
My Comm. Exp. Aug 2, 1989

EXHIBIT 'A'

PARCEL I:

LOTS NO. 3 AND 4 AND THE WEST HALF OF THE SOUTHEAST QUARTER OF SECTION 24, TOWNSHIP 18 SOUTH, RANGE 20 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

PARCEL II:

LOTS NO. 1, 2, 3 AND 4; THE EAST HALF OF THE WEST HALF; AND THE EAST HALF OF SECTION 19, TOWNSHIP 18 SOUTH, RANGE 21 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

PARCEL III:

THE EAST HALF AND ALL THAT PORTION OF THE NORTHWEST QUARTER LYING EAST OF THE EASTERLY BOUNDARY AND WEST OF THE WESTERLY BOUNDARY OF THE SOUTHERN PACIFIC TRANSPORTATION COMPANYS' RIGHT OF WAY IN SECTION 20, TOWNSHIP 18 SOUTH, RANGE 21 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT THE NORTH 30.00 FEET THERE OF; AND

EXCEPT THE SOUTH 35.50 ACRES OF THE SAID NORTHWEST QUARTER, LYING WEST OF THE EASTERLY BOUNDARY OF THE RIGHT OF WAY OF THE NEW MEXICO AND ARIZONA RAILROAD, AS DESCRIBED IN DEED RECORDED IN BOOK 60 OF DEEDS AT PAGE 265.

PARCEL IV:

THE NORTHEAST QUARTER AND THE WEST HALF OF SECTION 29, TOWNSHIP 18 SOUTH, RANGE 21 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPT FOR SOUTHERN PACIFIC TRANSPORTATION COMPANY'S RIGHT OF WAY, 200.00 FEET IN WIDTH, OVER THE WEST HALF THEREOF.

PARCEL V:

LOTS 1 AND 2; THE EAST HALF OF THE NORTHWEST QUARTER; AND THE EAST HALF OF SECTION 30, TOWNSHIP 18 SOUTH, RANGE 21 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

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PARCEL VI:

LOTS 3, 4, 5 AND 6 OF SECTION 32, TOWNSHIP 18 SOUTH, RANGE 21 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA.

EXCEPTING FROM SAID LOTS 3 AND 6, SOUTHERN PACIFIC TRANSPORTATION COMPANY'S RIGHT OF WAY, 200.00 FEET IN WIDTH.

880203259

FCSPRNCA0716

U.S. DEPARTMENT OF THE INTERIOR

ENVIRONMENTAL ASSESSMENT

DRAFT

PROPOSED LAND ACQUISITION
SAN PEDRO RIVER NATIONAL WILDLIFE REFUGE
COCHISE COUNTY, ARIZONA

Prepared by:

Fish and Wildlife Service
U.S. Department of the Interior

September 1979

FCSPRNCA0717

SUMMARY

A. Purpose and Authority

This report presents information pertinent to the Upper San Pedro River Basin and the proposed acquisition of approximately 60,000 acres of wildlife habitat for the San Pedro River National Wildlife Refuge. Outlined within this report are the general characteristics of the resources within the study area, the problems and needs of the area, some projections of future conditions, and presentation of alternative plans to preserve some of the Nation's best wildlife habitat for the benefit of the public.

The U.S. Fish and Wildlife Service is the sponsor of the Unique and/or Nationally Significant Wildlife Ecosystems Program. The ultimate goal of this program, as outlined in the Unique Wildlife Ecosystems Concept Plan, Arizona, U.S. Fish and Wildlife Service, Region 2, November 6, 1978, is the "preservation of such unique and/or nationally significant wildlife ecosystems * * * required to maintain viable wildlife communities within historic ranges." To carry out this program, the first step was to identify specific areas within the state which are or could be threatened along with pertinent supporting data. The San Pedro River area has been identified as such a nationally significant ecosystem.

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B. Use and Value of the Report

This report was developed from field reconnaissance, land studies, resource inventories, and a thorough analysis of many and varied specific resource documents. The main intent of this report and the information contained therein is to form the basis for making wise and sound decisions regarding wildlife habitat preservation in the study area. The information furnished can be used by local, county, and state governments; various natural resource conservation groups, land use commissions, councils of government, and planning agencies in establishing land use patterns and allocating resource priorities.

As a planning aid, the report will be helpful to State and Federal agencies in their long-range plans for transportation facilities, utility systems, fish and wildlife programs, development of parks and nature study areas, control measures for water resources, improvement in range and vegetation programs, developing controls for erosion and sediment projects, improving water quality, and other natural resource uses.

C. Study Area

The U.S. Fish and Wildlife Service is proposing the acquisition of approximately 60,000 acres of wildlife habitat along the San Pedro River for inclusion in the National Wildlife Refuge System. Figures showing the proposed refuge area are presented in Chapter I, Purpose and Need

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for Action. The general area of study includes four counties (Cochise, Pima, Pinal, and Santa Cruz) but the proposed refuge lies entirely within Cochise County. Interstate 10 and the Southern Pacific Railroad bisect the area. Sierra Vista, the largest city in the refuge area, is located on the western side of the area. Because the proposed refuge is located entirely in Cochise County, this study concentrated the impact assessment on the two counties most directly affected, Cochise and Pinal.

The San Pedro River heads in Sonora, in northwestern Mexico, about 20 miles south of the United States-Mexican border. Flowing north, the river crosses through Cochise and Pinal Counties, just barely touches the northeast corner of Pima County, and eventually empties into the Gila River southeast of Phoenix.

Two separate land grants, the San Rafael Del Valle Grant and the San Juan De Las Boquillas y Nogales Grant, comprise most of the proposed refuge area. The entire area is usually referred to as the Little Boquillas Ranch.

Generally, the area has an arid, warm, and temperate climate, with great attraction as a retirement community. Mean annual precipitation ranges from 8 to 12 inches in the valley. This combination of favorable climate conditions has made the area one of the fastest growing areas in the United States from a population standpoint. The expansion of military base facilities and increased electronic research at Fort Huachuca

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located near Sierra Vista have added to the population growth. Tourist activity has primarily resulted from vehicular traffic passing through the area enroute to other major tourist attractions. The area offers many advantages for continued growth: an abundance of land capable of being used for many purposes, untapped mineral reserves, and a favorable climate. One major natural resource that may limit such growth is the short water supply. Essentially all water used in the area is ground water, and this is being depleted faster than it can be replenished.

The proposed refuge area is composed primarily of Chihuahuan Desertscrub formation containing a variety of habitats, including riparian woodland, mesquite bosque, desertscrub, desert grassland, and oak woodland. Numerous peripheral wildlife species are found within these habitat types.

During the period 1950 to 1970, population within the general study area more than doubled and this trend has continued according to the last report dated July 1, 1978. Cochise County has grown at just about the same rate as the general study area, while Pinal County has experienced somewhat slower population growth. Growth has occurred primarily in the cities. Per capita income generally runs about 85 percent of the national average.

Agriculture contributes substantially to the economy of the general study area; in 1977, agricultural cash receipts totaled $351,959,000. In Cochise County, the 1977 agricultural cash receipts amounted to

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$57,065,000 or 16 percent of the total study area. Beef cattle are the main livestock class produced while sorghum is the main crop.

D. Scope

This report is concerned with the need for resource preservation and the environmental and the socioeconomic impacts related to Federal acquisition of affected lands. The proposed refuge area represents the largest remaining undeveloped stretch of the San Pedro River. The area contains riparian and grassland habitat of such quality and quantity sufficient to preserve the wildlife values which make the San Pedro River a "Unique Ecosystem." Much of the rest of the San Pedro River Valley has undergone development and has been converted to cropland, nonfarm individual homesites, and small communities.

The data in this report pertains to resource availability, use, quality, problems, and needs. The scope of the report is sufficient to the extent the decision document reviewer can make a general appraisal of both current and future resource problems, future development trends, and use this information for subsequent planning. The ultimate goal of this study is to achieve the wisest use of natural resources.

This report utilizes resource data as developed by other agencies and organizations.

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E. Controversy and Issues to Be Resolved

In this study, the only potential problem area encountered was the possible construction of Charleston Dam. This is a Bureau of Reclamation project to be located on the San Pedro River at Charleston and intended to impound a municipal and industrial water supply for the city of Tucson. While the project has been approved for construction, no funds have been made available and by Presidential order the project has been removed from the list to be submitted for funds. At the present time the project is being held in abeyance and no further action is contemplated.

F. Conclusions

Examination of all alternatives has indicated the acquisition of the proposed area is the most viable means of accomplishing the stated project objective: to identify and preserve threatened nationally significant ecosystems and to maintain wildlife communities within historic ranges.

G. Recommendations

The proposed alternative would be to acquire approximately 60,000 acres in fee simple and/or easement.

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I. PURPOSE AND NEED FOR ACTION

A. Proposed Action

The U.S. Fish and Wildlife Service proposes to acquire by fee title and/or easement (less any oil, gas, and mineral reservations) approximately 57,000 acres of privately owned land in Cochise County, Arizona. This land (along the San Pedro River and in a "grassland corridor" proceeding from the river toward the Huachuca Mountains) would be acquired as part of the National Wildlife Refuge System. Access and land use on the property would be in accordance with Federal laws and regulations pertaining to the management of fish and wildlife resources on national wildlife refuges. (See Appendix for regulations and policies applicable to land acquisition and the management of fish and wildlife resources on these lands.) Definitive site specific management will be addressed in a Master Plan for the area subsequent to acquisition by the U.S. Fish and Wildlife Service.

B. Project Area

The proposed San Pedro River National Wildlife Refuge (Figure 1) is located entirely within Cochise County, Arizona, between Benson and Hereford. Cochise County is located in the extreme southeastern part of the State and is adjacent to the Mexican State of Sonora. The proposed project includes the San Rafael Del Valle and San Juan De Las Bouquillas

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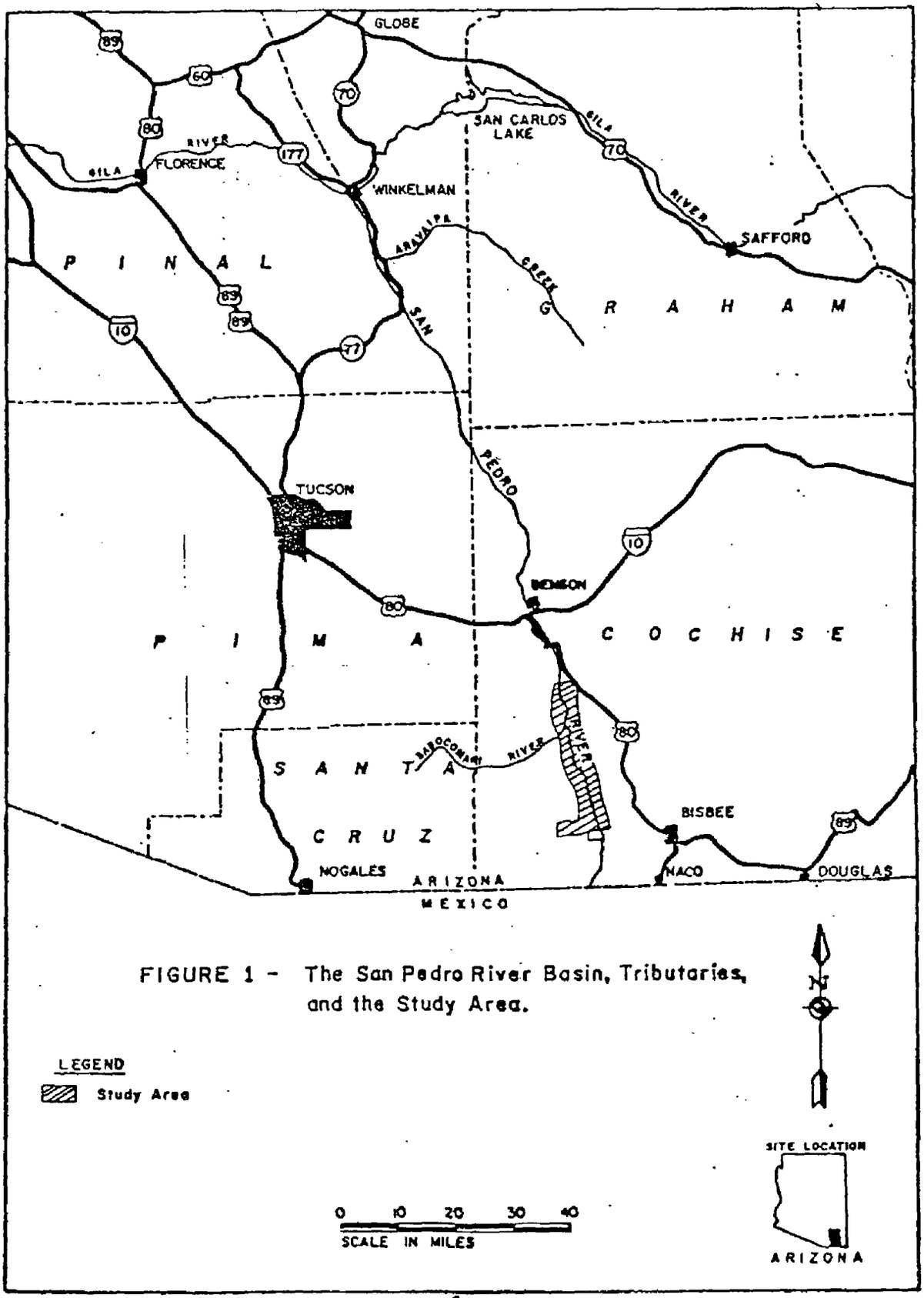

FIGURE 1 - The San Pedro River Basin, Tributaries, and the Study Area.

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Y Nogales land grants along with some adjacent lands and is known as the Little Boquillas Ranch. The property is currently owned by Tenneco West, Inc. Figure 2 is a detailed map of the proposed refuge acquisition area.

The largest urban settlement near the proposed acquisition area is the community of Sierra Vista. Other small municipalities are located along the San Pedro River; most are located at road junctions that cross the river itself. Major transportation routes are Interstate Highway 10 at Benson, Arizona; State Highway 82 at Fairbank; State Highway 90 south of Charleston; State Highway 77 at Mammoth. In addition, the Southern Pacific Railroad serves the basin from near Benson to south of Hereford, a distance of approximately 42 miles.

C. Need for Action

The subject property would be acquired through the authority contained in the Fish and Wildlife Act of 1956 (70 Stat. 1119; 16 U.S.C. 742 a-j) and with funding provided by the Land and Water Conservation Act of 1965 (78 Stat. 987), as amended (16 U.S.C. 4601-4, et seq.) These lands would be preserved as part of the "Unique Wildlife Ecosystems Habitat Preservation Program." The San Pedro River has been ranked No. 2 nationally under the Unique Ecosystems Program, based on biological attributes of the area as described in other sections of this document.

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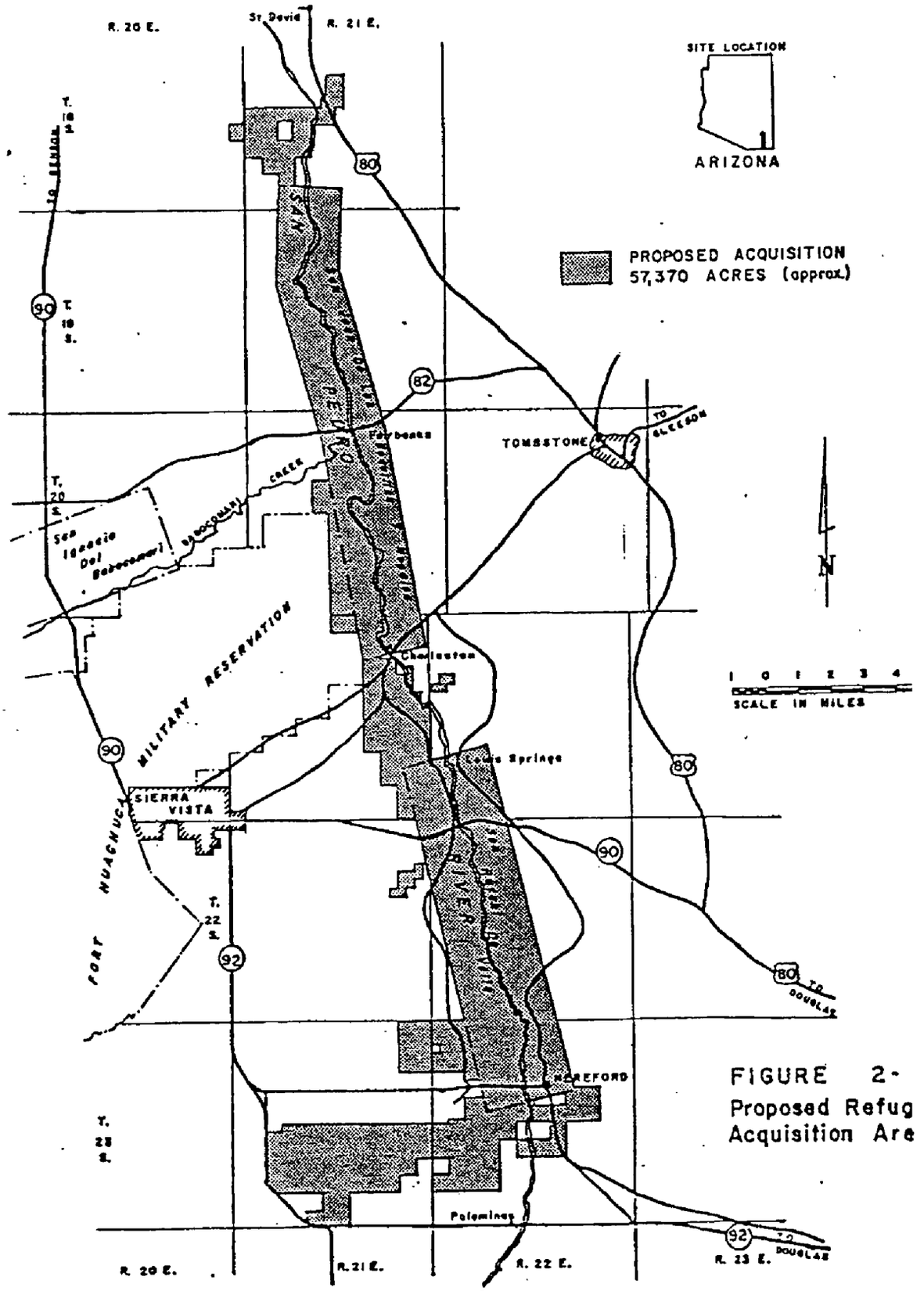

FIGURE 2-
Proposed Refug
Acquisition Are

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II. ALTERNATIVES

Alternative means of accomplishing the project objectives include: (1) no action, (2) leasing the project lands, (3) increasing the size of the project proposal, and (4) the proposed action. Each alternative is discussed below and a comparative analysis of the impacts of each is presented in Table 1.

A. No Action

Under a no action alternative, the U.S. Fish and Wildlife Service would not purchase, in fee or easement, any of the proposed project area along the San Pedro River. The project area is located in an area of Arizona that is becoming increasingly desirable for persons seeking a temporary retreat in the "Sunbelt" during the winter and for permanent retirees.

In addition, the amount of land being cleared for farming or ranching activities is rapidly increasing. It is likely that within 5 to 10 years much of the remaining area under consideration will be converted to more economically profitable uses.

With the no action alternative, the loss or destruction of most of the valuable wildlife habitat along the San Pedro River is imminent because of the economic pressures discussed above. This would have a significant negative impact on the numerous wildlife species of special concern. (See Chapter III, Section G.) This would result in the

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Table 1. - Comparative Analysis of Impacts of Project Alternatives

Project Alternatives	Environmental Parameters*										Comments - Principal Reasons for Rejecting or Accepting Alternative
	Climate	Air Quality	Geology & Soils	Energy & Mineral Resources	Water	Vegetation	Wildlife	Archeological & Historical Resources	Land Use	Socioeconomic Considerations	
No action	0	0	-	0	-	-	-	-	0	+	Rejected - No action would result in the eventual destruction of unique vegetational community and associated wildlife.
Lease	0	0	+	0	+	+	+	+	-	-	Rejected - Leasing would result in too much future uncertainty to the landowner and the Fish and Wildlife Service because either party could terminate the agreement at the end of any lease period.
Increase project size	0	0	+	0	+	+	+	+	-	-	Rejected - At the present time, none of the proposed additional lands are available for sale to the government, funding for these areas is not certain and studies are required to determine if additional lands are needed to satisfy program objectives.
Proposed project	0	0	+	0	+	+	+	+	-	-	Accepted - The proposed action will preserve the unique habitat and wildlife of the San Pedro without severe negative impacts on the local population.

*Legend:

0 -- No impact
+ -- Positive impact
- -- Negative impact

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irretrievable loss of this habitat for the length of time the area would be utilized for other purposes and the time required for regeneration of the area to its present state.

Without the project the area would remain on the county tax rolls but deprive the county of refuge revenue sharing funds. In addition, the owners of the land and certain segments of the county's population would be able to take advantage of the revenues generated on the land and continue to use the land for private pursuits.

B. Leasing the Project Lands

Alternative B would be to lease, if possible, portions of the proposed project area for wildlife management. Under a lease agreement, the U.S. Fish and Wildlife Service would assume management responsibility for wildlife on the proposed project lands or those portions of the area under lease. The purpose of this management would be to preserve wildlife diversity and quality wildlife habitat.

The impacts of this alternative would be similar to the proposed action. The owners would give up certain rights which might conflict with wildlife management goals. However, the lands would remain on the county tax rolls (identical to an easement proposal but different than fee acquisition) and the owners would retain all ownership and land management options except those prohibited by terms of the lease.

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Leases are for a specified number of years (easements can be perpetual) and the lease automatically terminates at the end of the lease period. If the lease were not renewed, the land again would be subjected to the threat of development. The lease would lead to uncertainty on the part of the landowner since the U.S. Fish and Wildlife Service might not renew the lease agreement contrary to the wishes of the landowner.

C. Increase the Size of the Proposal

This alternative would involve increasing the size of the proposed acquisition. Under this alternative, the U.S. Fish and Wildlife Service would purchase additional acreage along the San Pedro River. The Arizona Concept Plan (U.S. Fish and Wildlife Service, 1979) and the Arizona Committee of The Nature Conservancy have identified two other segments of the San Pedro River as "nationally significant" unique ecosystems (Figure 3). In addition, other areas along the San Pedro and its tributaries have been identified in the Concept Plan as "Areas for Future Study" and might be identified at a later date as areas worthy of acquisition. The purchase of additional lands under this alternative in the future would be dependent on the availability of tracts of high biological potential, need of additional lands to satisfy management objectives, and the availability of funding for acquisition of additional tracts.

Increasing the size of the proposed acquisition would protect to an even greater extent the native habitat of the San Pedro River which supports

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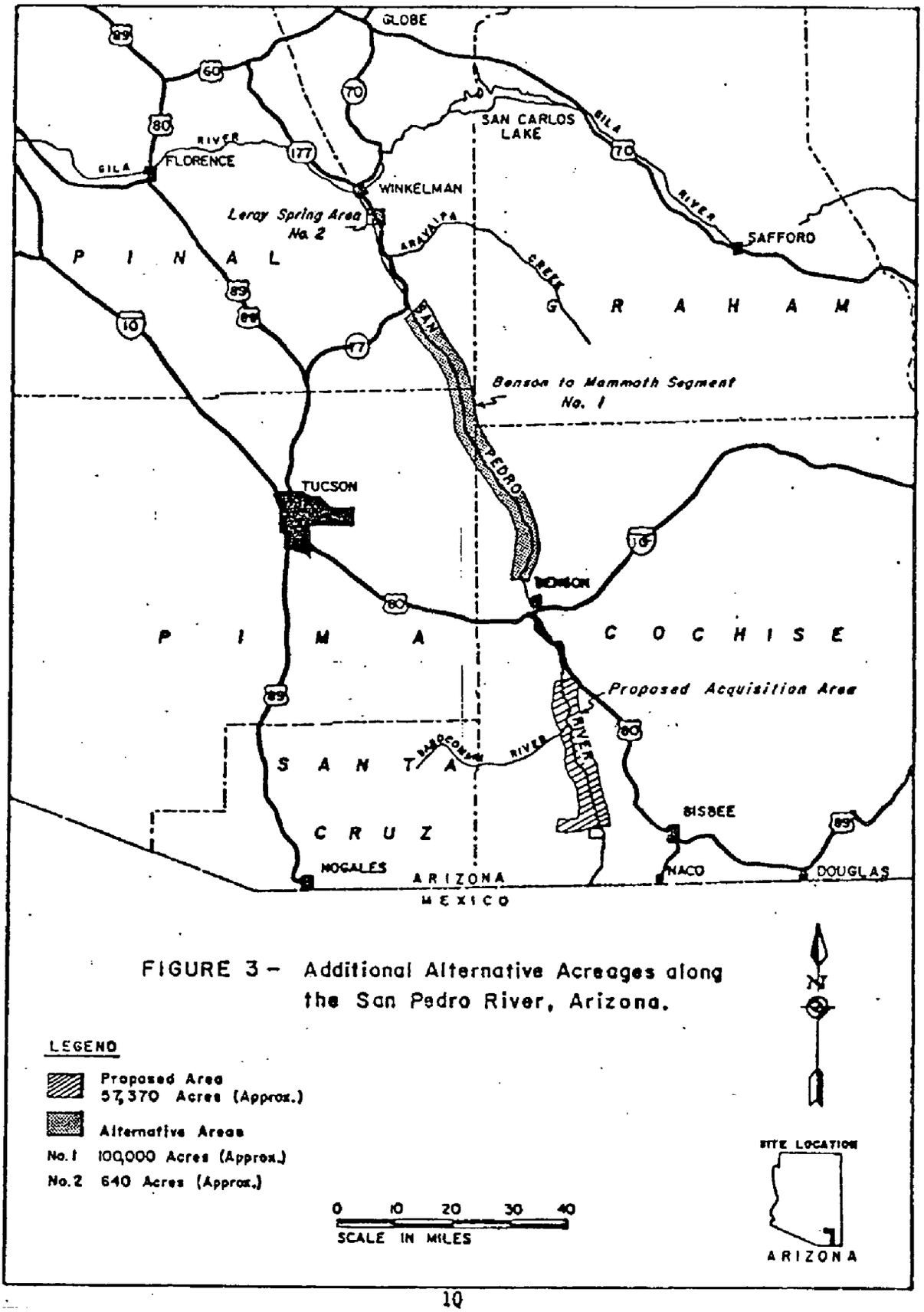

FIGURE 3 – Additional Alternative Acreages along the San Pedro River, Arizona.

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numerous plant and wildlife species unique to southeastern Arizona. Acquisition of lands to the north of the proposed project would also serve to increase the diversity of habitats preserved along the San Pedro River.

An increase in the size of the acquisition would increase the amount of land removed from agricultural or commercial development. Also, additional lands would be converted from private control to management by the Federal Government. The additional acreage would be removed from the tax rolls (if acquired in fee); however, additional Refuge Revenue Sharing Funds (probably in excess of present tax payments) would be available for the county's use.

D. Proposed Project

The proposed national wildlife refuge project, as outlined in Chapter I, Purpose and Need for Action, would involve the acquisition of approximately 57,000 acres of land in fee and/or easement. Certain impacts of the project proposal are like those outlined in several of the above alternatives. The impacts of the proposal are discussed in detail in Chapter IV (Environmental Consequences) and are summarized below.

The proposed acquisition would result in the preservation of approximately 57,000 acres of riparian and adjacent upland habitat and associated wildlife. Soil conservation and water quality in the area would

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improve after Fish and Wildlife Service acquisition. The extraction of mineral resources from the project lands could take place under Fish and Wildlife administration within existing guidelines. Archeological and historical resources also would be protected.

Several negative impacts would result from the proposed action. The present owners and the surrounding population would be deprived of at least a portion of the agricultural or commercial products or income that might be derived from the land. The present owners would be deprived of certain management options under either an easement or fee acquisition proposal. The county would not receive tax revenues from any lands purchased in fee. The county would receive Refuge Revenue Sharing Funds which usually exceed the money received by the county in property taxes.

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III. AFFECTED ENVIRONMENT

A. Climate

The San Pedro River Basin has an arid, warm, and temperate climate. Generally, the winters are mild and summer temperatures are moderate.

Mean annual precipitation in the valley area of the San Pedro River Basin ranges from 8 to 12 inches, while the lower mountain slopes receive from 16 to 20 inches. Almost one-half of the total annual precipitation occurs during July and August, while a second wet season occurs from middle December through the middle of March. The dry season is during May and June.

Moisture usually falls in the form of local thundershowers, covering comparatively small areas and of less than an hour's duration. On occasion, tropical storms move into the basin area, usually in the late summer, with a resulting heavy rainfall over large areas.

Rainfall during the winter is the result of storm fronts which cause precipitation over a large part of the river basin. Winter storms, while typically less intense than summer thunderstorms, are of longer duration. At the higher elevations such storms frequently result in snow.

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Relative humidity reaches a peak in August, moderates during December through February, and hits a low point in May and June. The Upper San Pedro River area around Sierra Vista, Bisbee, and Tombstone has a temperature-humidity index that remains in a comfortable or near comfortable range all summer.

January mean minimum temperatures are usually near freezing or below for the desert and valley slopes. Average daily temperatures in January range from 44° to 86°F in the same area. The lack of humidity causes large fluctuations in both winter and summer temperatures because there is intense surface heating during the day and radiational cooling at night. The mild climate has induced the development of retirement communities in the vicinity.

The length of the growing season varies widely in the basin area, depending upon the local elevation and nature of surrounding terrain. It ranges from 180 to 240 days for the entire river basin.

B. Air Quality

Due to the lack of heavy industry and large manufacturing facilities in the river basin, industrial air pollution is almost nonexistent. The only significant air quality deterioration is the result of wind-driven surface dust and off-road vehicular traffic. There might be a concentration of motor vehicle exhaust emission during periods of heavy truck traffic on U.S. Interstate Highway 10 where it crosses the San Pedro River at Benson.

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C. Geology and Soils

The San Pedro River Basin lies entirely within the Basin and Range Physiographic Province. Broad, semiarid to arid valleys, separated by sharply carved mountain ranges rising abruptly above the plains, characterize the area. The present physiographic makeup of the basin is the result of uplifting, faulting, and tilting. While erosion was taking place and the basins were being filled with sediment, the area continued to experience varying degrees of uplift, subsidence, faulting, and tilting. The formation of the basins, along with poor drainage systems, resulted in a rapid filling of the valley from retarded sediment movement.

In the case of the San Pedro Valley, the river is dissecting and rapidly removing this fill. Due to these alluvial deposits the basin contains the principal water supply of the area. The influence of valley fill and the aquifers will be covered in more detail in Section E, Water Resources, page 17.

The San Pedro River Basin contains rocks ranging in age from Precambrian through Quaternary periods. Older Precambrian rocks such as granitic and highly deformed metamorphic rocks underlie all of the area. In the San Pedro Valley the valley fill material is young alluvium (gravel, sand, and silt) over clayey and silty gravel, silt, gravel, sandstone, and siltstone. These are generally classified as Quaternary sedimentary deposits, bordered by Tertiary-Quaternary sedimentary rocks, with

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sporadic outcroppings of older Precambrian intrusive rocks, Cretaceous-Tertiary sedimentary rocks, Cretaceous sedimentary and volcanic rocks, Devonian and Mississippian sedimentary rocks, and Cretaceous-Tertiary intrusive rocks. The alluvial valley fill exceeds 5,000 feet in some places.

Soil studies in the basin have established 6 soil groups and 26 soil associations in the study area. Only two of these groups are found in the San Pedro Valley: (1) soils of the river bottoms and alluvial fans and (2) soils of the valley slopes. Soils in these two groups will support creosote bush, mesquite, cacti, annual grasses, and alkali sacaton. Grazing and irrigated farming would be the major uses of these soil groups.

D. Energy and Mineral Resources

The San Pedro River Basin contains important deposits of copper, sand and gravel, molybdenum, gold, stone, lime, silver, cement, zinc, and gypsum (U.S. Department of Agriculture, 1977; Wilson, 1962; U.S. Geological Survey, 1969). Arizona has ranked first in copper production in the United States since 1910, and the study area is one of the leading areas of Arizona in copper production. Copper is presently mined along the San Pedro at Mammoth and was extensively mined in Bisbee until 1974. Silver and gold were mined in significant quantities near the turn of the century but are now mainly obtained as a byproduct of base-metal ore mining. These precious metals are principally mined at

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Bisbee, Mammoth, and Dos Cabezas. Sand and gravel, ranking second only to copper in value, are mined within the proposed acquisition area.

Significant geothermal resources may exist in Cochise County at great depths. Presently, there are only surface indications (thermal springs and wells) of potential geothermal resources. However, the U.S. Bureau of Land Management has recently proposed the leasing of lands near Douglas, Arizona, for geothermal exploration. Other areas may be found in the San Pedro River Basin in the future.

E. Water Resources

1. Ground Water

The occurrence of ground water in the study area relates directly to the geology of the area. (See Chapter III, Section C. Geology and Soils, page 15.) Several periods of erosion produced the major aquifer of the San Pedro River Basin. This river valley alluvium consists of sand, clay, gravel, and silt and is largely accessible through wells of less than 200 feet in depth (State of Arizona Planning Division, 1971).

Based on an average annual precipitation of 15 inches, Cochise County receives over 5 million acre-feet of water per year. Evapotranspiration results in the loss of 97 percent of this total and, therefore, only about 1 to 3 percent of the precipitation contributes to ground water recharge (State of Arizona Planning Division, 1971).

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Ground water, the major water source in the study area, is being withdrawn faster than it can be recharged. Since 1940, it is estimated that 3,000,000 acre-feet of ground water have been withdrawn from the aquifers in Cochise County (State of Arizona Planning Division, 1971).

Large ground water withdrawals have caused a drop in the water table of 25 to 75 feet in most areas of Cochise County. However, net change in ground water levels adjacent to the San Pedro River has been negligible over the past 25 years. In the San Pedro River drainages it is estimated (1970 figures) that approximately 64,500 acre-feet of ground water are withdrawn and only 37,400 acre-feet are replenished annually (U.S. Department of Agriculture, 1977). In addition, there is approximately 78,000,000 acre-feet of ground water in storage in the San Pedro Basin, 63,000,000 acre-feet of which is stored from 1 to 700 feet.

2. Surface Water

Surface water in the proposed national wildlife refuge project area is principally in the form of perenially or permanently flowing streams and rivers. No major lakes or impoundments exist in the project vicinity. Numerous stock tanks and reservoirs fed by artesian and drilled wells exist in the flood plain. One large impoundment, Charleston Dam, has been proposed by the U.S. Bureau of Reclamation along the San Pedro within the project area but is not presently scheduled for construction.

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The San Pedro River flows approximately 125 miles northerly from Mexico with headwaters in the Sierra Mariquita and Sierra De Los Ajos (25 miles south of the United States/Mexico border) and joins the Gila River about 80 miles southeast of Phoenix. The San Pedro enters the United States at an elevation of 4,275 feet and joins the Gila River at 1,920 feet. The major tributaries to the San Pedro are the Babocomari River, Lewis Springs, and Aravaipa Creek. Numerous ephemeral or intermittent streams; draining portions of the Huachuca, Whetstone, Dragoon, Rincon, Santa Catalina, and Galiuro Mountains; flow into the San Pedro River.

Average annual streamflow of the San Pedro River is extremely variable but the river is normally less than 40 feet wide and 2 feet deep (Nabhum, 1975). Generally speaking, the river has a year-round flow from the international border to Benson and is intermittent to the north (U.S. Department of Agriculture, 1977). During periods of drought, some sections of the lower reaches may be dry, even though ground water may be near the surface along the river channel. High temperatures, low humidity, and a paucity of precipitation (8 to 12 inches per year) promote extremely high evaporation rates (up to 36 inches) and provides for only a small amount of runoff into the basin (State of Arizona Planning Division, 1971). Average annual runoff for the area is approximately 1 inch, compared to a national average of 9.4 inches. Table 2 provides a summary of the surface water resources at selected gaging stations.

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Table 2. - Summary of Streamflow Data at Selected Gaging Stations in the San Pedro River Area, Arizona 1/

Gaging Station	Drainage area (mi^2)	Streamflow				Percentag time th daily fl equals or e 1 ft^3/
		Average		Maximum	Minimum	
		(ft^3/s)	(ac-ft)	(ft^3/s)	(ft^3/s)	
San Pedro River at Palominas	741	31.6	22,890	22,000	0	69
San Pedro River at Charleston	1,219	61.4	44,480	98,000	0.5	99+
San Pedro River near Redington	2,939	46.4	33,620	28,600	0	44
San Pedro River near Mammoth	3,610	61.6	44,600	50,000	0	44
Aravaipa Creek near Feldman	541	30.0	21,740	10,500	0.3	88
San Pedro River 2/ at Winkelman	4,471	46.0	33,330	15,000	0	--

1. Sources:

   (a) U.S. Geological Survey, 1970
   (b) R. H. Roeske and W. L. Wenell, 1971

2. This station replaced station 4734 (near Winkelman); drainage area, 4469 square miles.

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few areas along the river have concentrations of heavy metals exceeding State standards.

F. Vegetation

1. General

The San Pedro River Basin and the entire national wildlife refuge project area lie within the Upper and, principally, the Lower Sonoran Life Zones. The flood plain and surrounding uplands are part of the Southwestern Desertscrub, composed of Chihuahuan desertscrub and Sonoran desertscrub (Lowe, 1964). The vegetation of the Southwestern Desertscrub is primarily influenced by the paucity of precipitation and is composed of typical desert flora. The only variation from the typical desert scrub vegetation type in this zone occurs in the flood plain (i.e., riparian) areas which are dominated by broadleaf deciduous tree species. Besides the typical scrub species, the Southwestern deserts also are known for the large number of ephemeral wildflowers, present only after years with sufficient winter precipitation (Lowe, 1964, and Kearney et al., 1960).

The Upper Sonoran Zone is found in only a small portion of the study area along the grassland corridor on the slope of the Huachuca Mountains. This Upper Sonoran Zone is composed of two vegetational communities: the desert grassland and oak woodland. Vegetation in this zone is dominated by more mesic plant species, such as grasses and

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trees, which respond to the increased altitude and precipitation of this zone.

2. Habitat Types

Within the study area a good variety of habitat types exists and the following specific habitat types have been noted and are discussed individually below: (a) deciduous riparian, (b) mesquite bosque, (c) sacaton meadows, (d) wet meadow/cattail marsh, (e) Chihuahuan desertscrub, (f) Chihuahuan desert grassland, (g) oak woodland, and (h) Arizona upland subdivision of the Sonoran desertscrub.

a. Deciduous riparian woodlands

Deciduous woodlands are generally characterized by the presence of broadleaf deciduous trees that may reach heights of 50 to 100 feet occurring along streams, rivers, flood plains, etc. (Lowe, 1964). This habitat type forms a distinct, stable vegetational community which dissects the Chihuahuan desertscrub community along the southern part of the San Pedro River and the Sonoran desertscrub community north of Benson.

The San Pedro River has excellent riparian growth which is dominated by cottonwood (Populus fremontii) and willow (Salix spp.) within the proposed project area. Almost no saltcedar (Tamarix pentandra) occurs along the river within the proposed project area. The northern portions

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of the San Pedro River are dominated by mesquite (Prosopis juliflora) and saltcedar with cottonwood and willow being of lesser importance (Zimmerman, 1969).

Within our proposed acquisition area, various age stands of cottonwood are present and are indicative of good regeneration of cottonwood seedlings. This is not the case on many other segments of the river, primarily downstream or north, where cottonwood regeneration is poor. The causes for this poor regeneration of cottonwoods are probably numerous, including several of the following: (1) overgrazing by cattle, (2) lowered and more saline water table, and (3) competition from saltcedar.

Other vegetation found in the deciduous riparian woodland habitat includes seepwillow (Baccharis sp.), mesquite, graythorn (Condelia lycioides), catclaw (Acacia greggii), white-thorn (Acacia constricta), and rabbitbrush (Chrysothamnus nauseosus). Rarer species include hackberry (Celtis reticulata), desert-willow (Chilopsis linearis), Arizona ash (Fraxinus velutina), Arizona walnut (Juglans major), tree tobacco (Nicotiana glauca), and Arizona sycamore (Platanus wrightii).

Several tributaries, including the Babocomari River and Arivaipa Creek, also contain good riparian habitat. Some of these areas have a different vegetational composition; this results from the lower mineral content of some of the tributary streams and the more confined flood plain of these tributaries, which produce a different microclimate

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(Zimmerman, 1969). Confined canyons and less mineralized water promote riparian growth dominated by sycamore, Arizona walnut, Arizona ash, and cottonwood (as a secondary species).

b. Mesquite bosque and sacaton meadows

The remainder of the river flood plain, above the cottonwood-lined streambed, consists of two types of habitat: mesquite bosque and sacaton meadows. The difference in composition between these two types along the river is very noticeable. Some areas have nearly entire stands of sacaton (Sporobolus wrightii) with mesquite growing only around the periphery while others show considerable amount of mesquite scattered throughout. Still other areas in the flood plain have very dense stands of mesquite with sacaton appearing only in scattered clumps as an understory plant. Other plant species abundantly interspersed throughout the mesquite bosque and sacaton meadows are catclaw, whitethorn, bermuda grass (Cynodon dactylon), and four-wing saltbush (Atriplex canescens).

The river flood plain between Hereford and Lewis Springs is quite expansive, approaching 1 mile in width in some areas. However, from Lewis Springs for approximately 5 miles north, the river flood plain is greatly constricted and referred to as the Narrows. There is a very limited amount of mesquite bosque or sacaton meadows along this portion and the river channel breaks rather abruptly from riparian habitat into desertscrub habitat.

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c. Wet meadows/cattail marsh

On the west side of the river at the extreme northern portion of the proposed national wildlife refuge study, a truly unique mixture of habitats exists. The flood plain in this area contains several artesian flows which have created a wet sacaton meadow or cienega. In the early 1900's, this portion of the flood plain was farmed and has since been abandoned. However, the effects of the farming operation have changed much of the area into a marshland. Several remaining impoundments fed by artesian flow have grown up in cattail (Typha spp.), rushes (Scirpus spp.), and other aquatic plants. The artesian flow continues in most of the small (1 acre or less) impoundments. These marsh areas, interspersed throughout the remainder of the wet meadow, provide some excellent and diverse wildlife habitat.

Formerly the San Pedro River had numerous marshy areas and beaver ponds. John Spring, a soldier at Ft. Huachuca in the late 1800's, reported that it was necessary to detour well into Mexico to cross the river during periods of heavy rain (Lane, 1977). The elimination of most, if not all, of the beaver from the river along with increased water usage and the heavy silt load in the San Pedro River have eliminated most of these marshy areas.

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d. Chihuahuan desertscrub

The Chihuahuan Desert is found only in the extreme southeastern portion of Arizona, primarily in Cochise County. At present, the Chihuahuan Desert is essentially a shrub desert. Grasses are more abundant and cacti are less than in the Sonoran Desert. The Chihuahuan Desert is considered to be a climax grass community by some authors (Lowe, 1964); however, recent environmental changes and invasion by shrubby species have produced pronounced changes in this community type.

Within the San Pedro River Basin, Chihuahuan desertscrub is found adjacent to the flood plain and riparian zone from near the United States/Mexican border to near Cascabel (just southeast of the Cochise-Pima County line). Near Hereford the Chihuahuan desertscrub intergrades with desert grassland habitat and near Cascabel with the Arizona upland subdivision of the Sonoran Desert (Lowe, 1964; University of Arizona, Office of Arid Land Studies, 1978; Zimmerman, 1969). Generally, Chihuahuan desertscrub occurs between 3,800 and 5,000 feet, with limited occurrences to 3,200 feet. Average annual precipitation within this habitat type ranges from 10 to 16 inches.

The Chihuahuan desertscrub community of the project area is dominated by creosotebush (Larea divaricata) and tarbush (Florensia cernua). Other species include sandpaperbush (Mortonia scabrella), white-thorn, all-thorn (Koebelinia spinosa), mesquite, and greythorn.

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e. Chihuahuan Desert grassland

This habitat type is a transitional type from the Chihuahuan desertscrub to oak woodland habitat at higher elevations. These desert grasslands range between 3,500 and 5,000 feet in elevation and receive between 9 and 18 inches of precipitation annually. The grasses found in this habitat usually grow in bunches separated by intervening bare ground (Lowe, 1964). Areas that have been overgrazed have large numbers of shrubby, desert species.

Within the proposed project area, desert grassland habitat is found within a very restricted area referred to as the grassland corridor. The mouth of the canyons on the east side of the Huachucha Mountains broaden out into an alluvial fan between the base of the mountains and the San Pedro River near Hereford. The vegetation is that of desert grassland forming a transition zone between the river and the mountains.

This grassland is made up of such dominant species as plains lovegrass (Eragrostis intermedia); curly mesquite (Hilaria berlangeri); mixed gramas [i.e., blue (Bouteloua gracilis), black, sideoats (B. curtipendula), Rothrock (B. rothrockii)]; and others such as beardgrass (Andropogon spp.), several species of three-awns (Arstida spp.), sprangle-top (Leptochloa spp.), and cotton-top (Trichachne spp.).

The lower elevations, as well as some of the washes, are interspersed with mesquite, catclaw, and white-thorn but not in dense stands as are found in the flood plain.

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f. Oak woodland

Only a very small portion of the study area is composed of this habitat type. The oak woodland or encinal habitat is transitional between the lower desert grassland and the ponderosa pine woodland. This encinal habitat type is an open woodland with numerous species of grasses, succulents, and cacti.

At the extreme western portion of the study area, near the base of the Huachucha Mountains at approximately 4,700-foot elevation, the grassland diminishes and oak woodland begins. Here, three dominant oak species occur: Emory oak (Quercus emoryi), Mexican blue oak (Q. oblongifolia), and Arizona white oak (Q. arizonica). Also scattered throughout the oaks are pointleaf manzanita (Arctostaphylos pungens), and agave (Agave sp.) with grassy understory.

g. Arizona uplands

The Arizona uplands is a distinct habitat type of the Sonoran Desert in the State. The Sonoran Desert covers most of the southwestern and a small area in the southeastern portion of the State of Arizona, but occupies only a small portion of the San Pedro River Basin. It does not occur within the proposed acquisition area. It is the hottest and dryest of the deserts; rainfall in the Arizona uplands is biseasonal (Lowe, 1964) and averages only 8 to 12 inches.

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The Arizona uplands subdivision of the Sonoran Desert is composed of a creosotebush/bur-sage community in the Lower San Pedro River Basin. This community type is composed mainly of shrubs and dwarf shrubs, primarily creosotebush and white bur-sage (Franseria dumosa) in most areas. Other common shrubs and cacti include the saguaro (Cereus giganteus), prickly pear and cholla (Opuntia spp.), hedgehog and rainbow cacti (Echinocereus spp.), brittle-bush (Encelia farinosa), jojoba (Simmondsia chinensis), and catclaw (Zimmerman, 1969; and University of Arizona, Office of Arid Land Studies, 1978).

3. Rare and Endangered Species

Table 3 presents a list of six species of plants under consideration for endangered or threatened status (U.S. Department of the Interior, Fish and Wildlife Service 1976) that are of possible occurrence within the San Pedro River Basin. None are known to occur within the boundaries of the proposed San Pedro National Wildlife Refuge although it is quite possible that future studies may confirm the presence of some of these species within the proposed refuge boundaries.

G. Wildlife

1. General

Wildlife species occupying the habitat types discussed above are both diverse and plentiful. The proposed project area supports many

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Table 3. - Plant Species Being Considered for Endangered or Threatened Status of Potential Occurrence Within the San Pedro River Basin (U.S. Department of the Interior, Fish and Wildlife Service, 1976)

Scientific Name	Known Arizona Distribution	Known Habitat	Family
Echeveria collomae	Gila, Maricopa, Pinal, and Yavapai Counties	Rocky areas	Crassulaceae
Echeveria rusbyi	Pinal, Pima, Greenlee, and Graham Counties	2,500-4,000 feet desert grassland, riparian woodland, rock crevices	Crassulaceae
Echinocereus triglochidiatus var. arizonicus	Pinal and Gila Counties	Chaparral-woodland	Cactaceae
Greenella discoidea	Pima and Cochise Counties	---	Compositae
Pectis rusbyi	Pima, Pinal, Yavapai, and Maricopa Counties	Desert-grassland	Compositae
Sphaeralcea fendleri ssp. albescens	Santa Cruz and Cochise Counties and extreme southern Arizona	Thickets along streams in live oak belt	Malvaceae

peripheral, special interest species that have ranges restricted to a small portion of the southwest or even extreme southeastern Arizona. In addition, several species almost have their entire breeding ranges in the United States restricted to the San Pedro River and its tributaries.

The majority of the information on the wildlife resources of the San Pedro River Basin is based on a wealth of previously published information. Within the time frame available during our recent studies, no

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extensive wildlife population surveys could be initiated. Therefore, previously collected and documented data must be utilized. For purposes of this report, discussion of wildlife values will center on the vertebrate faunal groups since little information is available for invertebrates.

2. Mammals

The San Pedro River Basin contains one of the most diverse mammalian populations in the United States, both in terms of number of species and groups. Approximately 60 species occur or possibly occur in the San Pedro River Basin and the proposed project area. A total of 78 species have been found in the adjacent Huachuca Mountains (Hoffmeister and Goodpaster, 1954). Dr. Michael L. Rosenzweig (personal communication, 1977), in comments pertaining to the studies of Hoffmeister and Goodpaster, has pointed out that the mammalian diversity of this and other large areas has two components: (a) alpha diversity - the richness at a single point - and (b) beta diversity - the richness that results from a wealth of habitat types packed into a standard-size geographic area. It is the latter which usually accounts for high diversity. For example, the 115 species found in a mountainous area of Costa Rica (the only area that has exceeded the mammalian diversity of the Huachucas) result from the large number of life zones in the area. However, it is the former, diversity at a single spot, which is indicative of a truly complex natural community. This is what occurs in the San Pedro River area.

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Equally as interesting as the great diversity of the area are the complex interrelationships of allied species found in this small area. For example, three species of harvest mice, three species of kangaroo rats, or three species of pocket mice may be found in an area of not more than an acre. In addition, all four species of North American skunks are found together in the Huachuca Mountains.

Common species found within the Lower Sonoran Life Zone along the San Pedro River include: the mule deer (Odocoileus hemionus), kit fox (Vulpes macrotis), coyote (Canis latrans), three species of kangaroo rat (Dipodomys spp.), two species of grasshopper mice (Onychomys spp.), four species of pocket mice (Perognathus spp.), three species of harvest mice (Reithrodontomys spp.), the hispid cotton rat (Sigmidon hispidus), antelope and black-tailed jackrabbits (Lepus alleni and L. californicus), and desert shrew (Notiosorex crawfordi). Within the Upper Sonoran Life Zone commonly are found the brush mouse (Peromyscus baylii), desert cottontail (Sylvilagus audubonii), Coue's white-tailed deer (Odocoileus virginianus couesi), Coati (Nasua narica), white-throated wood rat (Neotoma albigula), the yellow-nosed cotton rat (Sigmodon ochrognathus), and three species of skunks.

Good populations of white-tail and mule deer are found in the oak woodland and desert habitats respectively. Javelina (Dicotyles tajacu) are uncommon in the desert habitats. Other small game mammals present in good numbers include the previously mentioned jackrabbits.

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The only mammal of special concern known to occur in the area is the coati, a species listed as a Group IV species or a species of "limited distribution" (Arizona Game and Fish Commission, 1978). Coati are considered to be rare but increasing in the Huachucas and are found primarily in wooded canyons (primarily in the chaparral zone just outside of the project area).

3. Birds

The avian fauna is distinguished by its diversity and by the presence of many peripheral (Mexican) species. The principal reasons for this diversity of avian species, especially peripheral birds, is a result of the exceptional habitat diversity, mentioned earlier, coupled with the north-south orientation of the river and proximity to near tropical drainages such as the Rio Yaqui in Mexico. The factors combine to make the San Pedro River Valley a valuable migration corridor and one of the most unique watersheds in the United States (Glinski, 1978). Approximately 275 species of birds are found in the vicinity of the San Pedro River and the Huachuca Mountains (The Nature Conservancy, n.d.; Davis and Russell, 1978; and Phillips, Marshall, and Monson, 1964), including approximately 175 breeding species. This total includes approximately 15 species of hummingbirds (probably the most species within a comparably sized area in the United States) and an extensive transient and breeding raptor population. Mr. Doug Danforth (personal communications, 1978) has recorded 106 species at Cook's lake, 159 species at St. David Springs area, and 96 species at Charleston, all along the San Pedro

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River within a 5-year period. In addition, Gavin and Sowls (1975) recorded 95 species from mesquite bosques along the San Pedro River in just over a year. In addition, during brief field studies of the area by the U.S. Fish and Wildlife Service personnel during the winter, over 50 species were noted in 1 week.

The greatest number of bird species present in the San Pedro River Basin is found in the riparian habitat types: the riparian woodlands, mesquite bosque, and sacaton meadows. Common species of the riparian areas (deciduous riparian and mesquite bosque/sacaton meadows) include Gambel's (Lophortyx gambelii) and scaled (Callipepla squamata) quails; ground (Columbina passerina), mourning (Zenaida macroura), white-winged (Z. asiatica), and Inca (Scardafella inca) doves; black-chinned hummingbird (Archilochus alexandri); barn (Tyto alba) and great horned (Bubo virginianus) owls; Gila (Melanerpes uropygialis) and ladder-backed (Picoides scalaris) woodpeckers; ash-throated (Myiarchus cinerascens) and vermillion (Pyrocephalus rubinus) flycatchers; curve-billed and Crissal thrashers (Toxostoma curvirostre and T. dorsale); Phainopepla (Phainopepla nitens); Bell's vireo (Vireo belli); yellow-breasted chat (Icteria virens); cardinal (Cardinalis cardinalis); Pyrrhuloxia (Cardinalis sinuata); Abert's and green-tailed towhees (Pipilo aberti and P. chlorurus); and white-crowned sparrow (Zonotrichia leucophrys). In addition, the wet meadows and cattail marsh support seasonal concentrations of several species including several heron and egret species, ducks, sora (Porzana carolina), common gallinule (Gallinula chloropus), some shorebirds, long-billed marsh wren (Telmatodytes

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palustris), common yellowthroat (Geothlypis trichas), red-winged blackbird (Agelaius phoeniceus), and swamp sparrow (Melospiza georgiana).

The most impressive and significant segment of the avifauna of the riparian habitat types is the raptor population. Twenty species of diurnal raptors (excluding owls) are or have been confirmed from the San Pedro River. Presently, 12 of these species nest along the San Pedro proper, its major tributaries, or in adjacent desert or cliff habitats. Table 4 presents a list of these species with comments on their abundance and seasonal occurrence. The most significant species of these raptors are the Mississippi kite (Ictinia mississippiensis), zone-tailed hawk (Buteo albonotatus), gray hawk (Buteo nitidus), Harris' hawk (Parabuteo unicinctus), and black hawk (Buteogallus anthracinus).

Important avian species found in the desert scrub habitats of the Lower Sonoran Zone along the San Pedro River include the red-tailed hawk (Buteo jamaicensis), Harris' hawk, roadrunner (Geococcyx californianus), elf owl (Micrathene whitneyi), lesser nighthawk (Chordeiles acutipennis), verdin (Auriparus flaviceps), cactus wren (Campylorhyrchus brunneicapillus), rock wren (Salpinctes obsoletus), black-tailed gnatcatcher (Polioptila nigriceps), and black-throated sparrow (Amphispiza bilineata). A large number of species common in the mesquite bosque are common in those desert habitats containing a large percentage of mesquite and similar species.

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Table 4. - Raptors of the San Pedro River, Arizona*

Turkey Vulture (Cathartes aura) - Common during migration and summer.

Mississippi Kite (Ictinia mississippiensis) - Locally common nester. Nests in cottonwoods. Total population in August 1977 after 12 young fledged was about 50 birds, which is nearly 70 percent of Arizona's kite population.

Sharp-shinned Hawk (Accipiter striatus) - Common in cottonwood forest during migration; uncommon during winter.

Cooper's Hawk (Accipiter cooperii) - Common throughout year. High nesting density along river proper, many nests less than 1 mile apart in mature cottonwood-mesquite forests.

Red-tailed Hawk (Buteo jamaicensis) - Common throughout year. Nests in cottonwood trees and rock outcrops.

Swainson's Hawk (B. swainsoni) - Uncommon nester in grasslands near river and rare along riparian. Locally common during migration.

Zone-tailed Hawk (B. albonotatus) - Nests locally along river proper and in tributary canyons. Nests in cottonwood and sycamore trees.

Rough-legged Hawk (B. lagopus) - Uncommon winter resident in bordering grasslands.

Ferruginous Hawk (B. regalis) - Locally common fall and winter resident in agricultural fields, especially alfalfa fields, and in bordering grasslands.

Gray Hawk (B. nitidus) - Locally common nester. Approximately one-third of total U.S. population occurs along river. Nests in cottonwood trees.

Harris' Hawk (Parabuteo unicinctus) - Historically nested near Charleston. Presently, one pair nests along river proper. The saguaro-palo verde habitat bordering the river at this site contains a dense population of nesting Harris' hawks.

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* Source: Glinski, Richard L. 1978. An introduction to the raptors and habitat of the San Pedro River. Unpublished manuscript. Arizona State University, Tempe. 6 p.

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Table 4 - Continued

Black Hawk (Buteogallus anthracinus) - Recently, one pair had nested along the river proper in a cottonwood, but site was destroyed in 1972 when habitat was cleared for agriculture. Over 15 nesting sites occur in tributary canyons.

Golden Eagle (Aquila chrysaetos) - Occurs uncommonly during fall and winter. Nests locally on cliffs of bordering mountains.

Marsh Hawk (Circus cyaneus) - Locally common over agricultural fields along riparian and over bordering grasslands during fall and winter.

Osprey (Pandion haliaetus) - Uncommon during fall and winter along river proper.

Prairie Falcon (Falco mexicanus) - Uncommon over agricultural fields and bordering grasslands and desert scrub. Nests on cliffs of bordering mountains.

Peregrine Falcon (F. peregrinus) - Historically nested in bordering mountain ranges. Presently, occurs uncommonly over agricultural fields and bordering grasslands during migration and winter.

Aplomado Falcon (F. femoralis) - Historically, nested near Sierra Vista and observed along upper San Pedro generally. Presently, rare, unconfirmed sightings from this vicinity.

Merlin (F. columbarius) - Rare winter visitors of agricultural fields and bordering grasslands.

Kestrel (F. sparverius) - Common year-round resident. Nests in cottonwood hollows along river proper.

Birds of the desert grassland are, like the vegetation, transitional between the desert scrub and oak woodland habitats. Avian species found in the grasslands include the Swainson's hawk (Buteo swainsoni), western kingbird (Tyrannus verticalis), Say's phoebe (Sayronis saya), white-necked raven (Corvus crypotoleucus), meadowlarks (Sturnella spp.), and

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numerous species of sparrows, including the nesting grasshopper (Ammodramus savannarum) and the wintering savannah (Passerculus sandwichensis), Baird's (Ammodramus bairdii), and Brewer's (Spizella breweri). The oak woodland commonly contains the following species: the great horned owl (Bubo virginianus), common flicker (Colaptes auratus), acorn (Melanerpes formicivorus) and ladder-backed woodpeckers, Mexican jay (Aphelocoma ultramarina), bushtit (Psaltriparus minimus), blue-gray gnatcatcher (Polioptila caerulea), and Hutton's vireo (Vireo huttoni).

Table 5 presents a list of avian species of special concern within the San Pedro River Basin. The Aplomado falcon (Falco femoralis) was once an uncommon nester within the San Pedro River Basin and along the United States/Mexico border in Texas and New Mexico. Today, however, this species probably no longer nests in the United States and is now only a transient in the proposed project area. The gray hawk is apparently increasing in numbers along the San Pedro River in response to changing habitat conditions (i.e., more xeric conditions) and forms the only substantial nesting population of this species in the United States. The Mississippi kite is also increasing along the river. Small nesting populations of both the black hawk and zone-tailed hawk are present principally along tributaries to the San Pedro River. The zone-tailed hawk is fairly stable, but the black hawk appears to be decreasing in numbers because of a decrease in aquatic based prey. Fair numbers of the tropical kingbird (Tyrannus melancholicus) and beardless flycatcher (Camptostoma imberbe) exist in the area. The Mexican duck (Anas

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Table 5. - Avian Species of Special Concern that Are of Potential Occurrence in the San Pedro River Basin, Arizona 1/ 2/

Group I. Species or subspecies extirpated from Arizona that may possibly be reestablished.

(R) Aplomado Falcon - Falco femoralis septentrionalis

Group II. Species or subspecies in danger of being eliminated from Arizona.

(S) Gray Hawk - Buteo nitidus

Group III. Species or subspecies whose status in Arizona may be in jeopardy in the foreseeable future.

(M) Great Egret - Casmerodius albus egretta
(M) Snowy Egret - Egretta thula brewsteri
(R) Black-crowned Night Heron - Nycticorax n. hoactle
(R) Black-bellied Whistling Duck - Dendrocygna autumnalis fulgens
(S) Zone-tailed Hawk - Buteo albonotatus
(S) Black Hawk - Buteogallus a. anthracinus
(R) Osprey - Pandion haliaetus carolinensis
(S) Beardless Flycatcher - Camptostoma imberbe ridgwayi

Group IV. Species or subspecies of special interest because of limited distribution in Arizona.

(P) Mexican Duck - Anas platyrhyncas diazi
(S) Mississippi Kite - Ictinia mississippiensis
(H) Lucifer Hummingbird - Calothorax lucifer
(H) Blue-throated Hummingbird - Lampornis clemenciae
(H) Coppery-tailed Hummingbird - Trogon elegans canescens
(S) Tropical kingbird - Tyrannus melancholicus occidentalis
(H) Buff-breasted Flycatcher - Empidonax fulvifrons pygmaeus

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1. Source: Arizona Game and Fish Commission. 1978. Threatened and Unique Wildlife of Arizona. Approved by October 21, 1978, Phoenix. 7 p.

2. U.S. endangered or threatened species are excluded from this list and are discussed in Chapter III, G. 6.

(P) Permanent resident along San Pedro
(S) Summer resident along San Pedro
(M) Migrant resident along San Pedro
(R) Recorded rarely from San Pedro
(H) Breeding species in Huachuca Mountains

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platyrhyncos diazi) still probably nests along the river but now as a "hybrid" population only. The remainder of the species are only transients (some very rare, see Table 5) or are present in good numbers in montane canyons of the Huachuca Mountains adjacent to the San Pedro River.

4. Reptiles and Amphibians

Approximately 60 species of reptiles and 20 species of amphibians are found within the area of the proposed project. The herptofauna that exists in the area at present is a reflection of the changing habitat conditions; groups that are found in arid, desert situations (e.g., lizards) are increasing at the expense of water-loving groups (e.g., frogs, toads, salamanders, and turtles).

Some of the common reptiles and amphibians in the area include the western and Couch's spadefoot toads (Scaphiopus hammondi and S. couchi), the red-spotted toad (Bufo punctatus), leopard frog (Rana pipiens), canyon treefrog (Hyla arenicolor), Sonora mud turtle (Kinosternon sonoriense), lesser earless lizard (Holbrookia maculata), zebra-tailed lizard (Callisaurus draconoides), collared lizard (Crotaphytus collaris), side-blotched lizard (Uta stansburiana), western whiptail (Cnemidophorus tigris), red racer (Masticophis flagellum), Sonora gopher snake (Pituophis melanoleucus), and western diamondback and black-tailed rattlesnakes (Crotalus atrox and C. molossus).

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Table 6 presents a list of reptiles and amphibians in the San Pedro River Basin that are classified as species of concern. The only two of these species known to occur within the proposed project area, the desert tortoise (Gopherus agassizi) and Gila monster (Heloderma suspectum), exist in unknown numbers. The status of the western massasauga (Sistrurus catenatus) and Arizona mountain kingsnake (Lampropeltis pyromelana) is unknown, and the three rattlesnake species are found in the Huachuca Mountains.

Table 6. - Reptiles and Amphibians of Special Concern that Are of Potential Occurrence in the San Pedro River Basin, Arizona*

Group I. Species or subspecies extirpated from Arizona that may be reestablished.

None.

Group II. Species or subspecies in danger of being eliminated from Arizona.

Western Massasauga - Sistrurus catenatus

Group III. Species or subspecies whose status in Arizona may be in jeopardy in the foreseeable future.

Desert Tortoise - Gopherus agassizi
Gila Monster - Heloderma suspectum

Group IV. Species or subspecies of special interest because of limited distribution in Arizona.

Arizona Tree Frog - Hyla wrightorum
Arizona Mountain Kingsnake - Lampropeltis pyromelana
Rock Rattlesnake - Crotalus lepidus klauberi
Twin-spotted Rattlesnake - Crotalus p. pricei
Ridge-nosed Rattlesnake - Crotalus w. willardi

* Source: Arizona Game and Fish Commission. 1978. Threatened and Unique Wildlife of Arizona. Approved October 21, 1978, Phoenix. 7 p.

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5. Fish

Good populations of fish and other aquatic organisms occurred in the San Pedro River (at least the permanently flowing portions) in the past. However, the pollution of the river with acid mine wastes from Mexico probably has eliminated most of the aquatic life from the river. Reintroductions may be possible in the future after stabilizing the waste ponds of the smelter in Mexico. (See Chapter III, E, page 21.)

6. Endangered or Threatened Fauna

A list of endangered U.S. species of past, known, or potential occurrence in the San Pedro River Basin is presented in Table 7. The Mexican wolf (Canis lupus baileyi) occurred in the area in the past and some individuals may still reach the area as transients. The bald eagle (Haliaeetus leucocephalus) is unknown from the area. The American peregrine falcon (Falco peregrinus anatum) historically nested in the surrounding mountains and is presently an uncommon migrant.

H. Cultural Resources

The San Pedro River is known in historic annals by various names. Coronado may have given it its first historic identity, the Rio Nexpa. Later, Fr. Eusebio Kino recorded it as Rio Terrante, or Rio de San Joseph de Terrante, by which it was known throughout the era of Spanish colonialism and, thus, most of historic times. The river also appears

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Table 7. - Endangered U.S. Species of Potential Occurrence Within the San Pedro River Basin, Arizona*

Mammals

Mexican Wolf - Canis lupus baileyi

Birds

Bald Eagle - Haliaeetus leucocephalus
American Peregrine Falcon - Falco peregrinus anatum

Reptiles and Amphibians

None

Fish

None

* Source: U.S. Fish and Wildlife Service.

during this time as the Sobahipuries, a folk identity which was derived from the name of the native Piman people who occupied the river until the mid-1700's.

Names which originated in the American era include the Puerco, Jose Pedro, Rio Terrante, and, ultimately, Rio San Pedro. The name may have derived from the Casas de San Pedro, just over the border in Sonora.

1. Prehistory

The San Pedro River Valley has figured prominantly in the development of archeology in the Southwest. A continuous span of occupation and use of

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the area is evident from 11,000 years ago up until the historic period, and it is expected that the San Pedro River Valley will continue to yield important information on prehistory as research in the area continues.

Plains-oriented Clovis hunters occupied the valley from 9500 B.C., and research at the Naco, Lehner, and Murray Springs sites has contributed significantly to our knowledge of this early big game hunting culture. Later, groups of bison-hunting Folsum hunters continued to exploit the area, but less intensively than their Clovis predecessors. Instead, a new subsistence based on the dependence upon a wide range of plant and animal resources gradually became the rule in the valley, and so by 7500 B.C., the primary reliance on big game had become a thing of the past.

This new life way, referred to collectively as the "Cochise" culture, endured with relatively little regional or temporal variation for 5,000 years, making it the predominant form of human use of the valley and the most successful. Remains of Cochise hunter-gatherer camp and activity sites have been identified throughout the San Pedro River and environs, and research into the origins, interworkings, and eventual outcome of this archaic culture is expected to continue.

A third life way, one based on settled village life and agriculture, began to emerge by 200 B.C. This type of subsistence base gave rise to a distinctive farming culture with numerous new material traits, the

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most conspicuous being pottery. As agriculture began to supplant the earlier dependence upon hunting-gathering, changes in man-land relationships brought about increased differentiation of cultures and localization of their traits. Thus, after 100 A.D. we recognize the farmers of the San Pedro River Valley and surrounding region by an array of similar cultural characteristics and a label: Mogollon. The pit-house dwelling Mogollon were probably descended from the archaic Cochise people in this area, unlike the contemporaneous Hohokam Desert farmers who came into the Santa Cruz Basin as migrants from northern Mexico. One concern of research that demands clarification is the degree to which the influx of these Hohokam village-dwelling irrigation farmers from Mexico may have influenced the archaic cultures in the hinterlands. Whatever early Mogollon-Hohokam contacts were like, it is known that the San Pedro River Valley subsequently became a point of contact between the Mogollon and frontier Hohokam, and that cultural cross-fertilization and sharing of traits is evident in this area.

What happened to the Mogollon after 1100 becomes increasingly unclear. When the Spanish arrived in the San Pedro River Valley in 1540, they encountered well established, resident populations of Piman "rancheria" Sobaipuri farmers.

2. History

The Coronado expedition of 1540 entered the present United States through the San Pedro River Valley. Local populations of Pima and

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Sobaipuri Indians were friendly, and the expedition passed through peacefully, following the stream to a point just below Benson.

This new region formed part of what the Spanish called Pimeria Alta. Late in the 17th century, the region became the field of missionaries, and much of the early written history of the peoples of Primeria Alta comes from the energetic work of the Jesuit Eusebio Kino. Quiburi, a populous rancheria on the San Pedro, became the site of a Spanish-Sobaipuri alliance, to protect the Spanish provinces from Apache raiders as much as to spread Christianity and friendship among the Indians.

Continued Apache depredation of San Pedro rancherias eventually forced the Sobaipuri to abandon the valley and to merge with people in the Santa Cruz and Gila. The Spaniards returned to the deserted rancheria of Quiburi in 1772 and built a presidio, called Santa Cruz de Quiburi. The late 1700's and early 1800's became an era of comparative peace with the Apaches and the valley supported modest ranching ventures until the mid-1800's, when Apache raiding flared up for the final time. Two land grants, the San Juan de Las Boquillas y Nogales and the San Rafael del Valle, surrounded much of the valley between Benson and Hereford. When the United States accepted the purchase treaty to lands south of the Gila in 1854, it agreed to recognize the validity of Mexican and Spanish titles to land grants in the area. When American settlers began moving into southern Arizona, they found that much of the choice land along the San Pedro River remained under Mexican title.

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The first American settlements on the river were in the lower river valley in 1865. Early wheat and barley farmers there soon found that life in Tucson promised a less precarious existence than the San Pedro River Basin where hostile Apaches roamed free. The area was deserted in 1875, but several communities later cropped up when the area was opened for homesteading in 1878. The rollicking frontier town of Charleston was established on the Boquillas Grant in 1879. During its brief life as a river camp, Charleston bustled with rustlers, miners, and soldiers in the 1880's.

I. Land Use

1. Introduction

The land use and natural vegetation of the San Pedro River in southeastern Arizona has been mapped using aerial photography from 1935, 1966, and 1977 (University of Arizona, Office of Arid Land Studies, 1978). Changes in cropland, riparian vegetation, mining, and residential uses during the past 43 years were assessed.

The study area for this land use study covered 78,800 acres. Width of the area varied with terrain and vegetation patterns. Average width was approximately 1.5 miles, 3/4 mile on both sides of the river from the international border to Winkelman, where it flows into the Gila River. Landownership of the San Pedro River Valley is diverse but primarily by private parties. The study area is depicted in Figure 1, page 2.

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Table 8 presents the land use and vegetation categories mapped in 1978 and their acreages. Previous land use, as interpreted on the 1935 and 1966 photographs, included three categories: dense riparian, agricultural, and cultural-industrial.

Acreages of these land use categories are presented in Table 9 which shows the change in each type from 1935, 1966, and 1978. More detailed designations were made for the current land use maps of 1978 because of the availability of infrared imagery and extensive fieldwork. However, for comparison with the other years, various categories were combined into the same three categories used for 1935 and 1966. The four 1978 land use categories of cottonwood, mesquite woodland, mesquite grassland, and tamarisk were combined into the dense riparian category. Thus, dense riparian land designated for 1978 in Table 9 signifies the same type of vegetation mapped using 1935 and 1966 imagery.

2. Historical Background

In 1853, the Gadsen Purchase resulted in the acquisition by the United States of a large portion of southeastern Arizona including the proposed San Pedro River National Wildlife Refuge. Westward migration into the area was encouraged. The establishment of the Arizona Territory in 1863 brought the homesteader into the area. Continued advances in transportation facilities and the movement of people, resources, and products made the San Pedro River area even more attractive. Mining began in the 1860's but most of the mining communities were abandoned by 1910.

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Table 8. - Categories of Land Use and Vegetation Types Mapped in 1978 and their Acreages

Category	Acreage
Cultural - human development, including residential or business districts	4,040
Cultural - transportation corridors, including highways and airports	914
Industrial - primary extractive mining; sand and gravel operations	2,050
Agricultural - any land with unidentified agricultural use	1,974
Agricultural - abandoned cropland	1,705
Agricultural - cropland; plowed fields; land which has been recently cleared	15,354
Agricultural - pasture, usually irrigated	3,246
Cottonwoods (Populus fremontii) - solitary stands or associations with willow, tamarisk, sycamore, ash, etc.	4,232
Tamarisk (Tamarix pentandra) - solitary associations	292
Sedges (Carex sp.) and sacaton (Sporobolus sp.) - marshlands	71
Sacaton (Sporobolus sp.) - grasslands	647
Mesquite (Prosopis juliflora) - woodland or bosque habitat	25,806
Mesquite scrub - solitary shrubs or associations with other shrubs such as gray-thorn, creosote bush, acacia, and four-wing saltbush	6,231
Mesquite grassland - mesquite shrub with grassland understory	4,907
River channel - unvegetated streambed	3,771
River channel community - annuals or immature riparian trees in streambed thickets	1,841
Chihuahuan Desert - tar-bush, creosote-bush, acacia, and associated shrub species	1,013
Desert grassland - grasses and associated shrubs	714
Sonoran Desert - paloverde, saguaro, brittle-bush and associated shrubs	6
TOTAL	78,814

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Table 9. - Changes in Acreages of Land Use and Vegetation of the San Pedro River since 1935

	1935	Percent of total	1966	Percent of total	1978	Percent of total
Dense riparian	17,300	22	30,400	39	34,200	45
Agricultural	8,900	11	14,600	19	22,300	28
Cultural-industrial	950	1	1,600	2	7,000	9
Other	51,650	66	32,300	40	14,300	18
TOTAL LAND AREA	78,800		78,800		78,800	

Ranching in the area also expanded rapidly during this period until a combination of massive drought and severe overgrazing had disasterous results in 1893. Since that time more attention has been paid to the capability of the land in supporting a level of grazing which will also maintain a forage base.

Today, very few undeveloped reaches of the San Pedro River remain on the lower portion of the river. Interspersed in this section are agricultural lands, individual homesites, and small communities. One piece of property in the lower reach of the river is considered a part of this acquisition proposal. The largest segment of the proposed area is in the upper reaches of the San Pedro River.

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3. Comparative Land Use

Agricultural acreage has increased significantly since 1935. Clearing of dense mesquite bosques for fields is ongoing. For example, in the Mammoth-San Manuel area, clearing of mesquite has even occurred since the aerial photography taken during the October flood of 1977. Active clearing of riparian woodland is also occurring south of Winkelman near Dudleyville.

Irrigated acreage was 2,700 acres in 1890, 12,500 acres in 1966, and dropped to 9,700 acres in 1970. This may account for many of the abandoned fields encountered during the fieldwork. Much of the abandoned land was located on ranch property along the Upper San Pedro River near Fairbank and Hereford. Crops currently grown in the San Pedro River Valley include sorghum, cotton, corn, barley, hay, as well as irrigated pasture.

Culture and industry have increased more than fourfold since 1966. Changes include increases in residential areas and expansion of extractive industry. Due to a mild climate and scenic surroundings, communities bordering the Upper San Pedro River study area such as Sierra Vista have recently attracted development. One of the major mining activities in the San Pedro River Valley today is gypsum, where the major share of Arizona's production is concentrated.

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Dense riparian land has also continued to increase. This increase was unexpected since agricultural and cultural-industrial expansion has visibly occurred since 1935 on dense riparian habitat. The increase may be attributed to several complex ecological factors operating since the last century. Changes in the populations of cottonwood, willow, tamarisk, and mesquite have been great.

In the Southwest, cottonwood and willow associations require perennial streamflows (or nearly so) for survival at elevations near 3,500 feet. These stands have been drastically reduced in the last 100 years because of the alteration of streamflow by upstream impoundments, channelization, ground water pumping, etc. Grazing has further aggravated this situation, negatively influencing the quality of the relict communities.

In contrast, mesquite has been increasing. In the beginning of this century it was absent in many riparian situations. A chronology of events which may have contributed to the increase of mesquite are as follows:

a. Overgrazing by cattle in the late 19th century
b. Subsequent severe runoff and flooding from the denuded landscape
c. Climatic drought and a lowering of the water table

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These events had a detrimental effect on those riparian species with shallow root systems such as cottonwoods, allowing only those deep-rooted species to survive and grow vigorously. Mesquite, with its 50- to 100-foot taproot, may have been able to take advantage of this situation.

Tamarisk has also drastically increased since its introduction to this continent. (But only in the northern portion of the San Pedro River Basin outside the project area. See also Section III, F. Vegetation, page 24.) It probably was not present along the San Pedro River in 1935. However, since it is capable of outcompeting native riparian species, it has intruded into many situations.

J. Socioeconomic Considerations

1. General

The San Pedro River Basin includes a four-county study area, but Cochise and Pinal Counties would be the areas most directly affected. The San Pedro River does impinge upon a small portion of Pima County but the area is so small it is insignificant. In addition, Pima County includes the Standard Metropolitan Statistical Area (SMSA) of Tucson which would bias any analysis of the project area.

The 1972 OBERS (Office of Business Economic Research Service) Projections and recent economic research data compiled by the Arizona

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Department of Economic Security form the basis for most of the survey data. In addition, Arizona agricultural statistics used were compiled by the Arizona Crop and Livestock Reporting Service. Economic area surveys performed by the Soil Conservation Service and the Bureau of Land Management were used to supplement portions of this section. The accuracy of long-range economic and demographic projections should be taken as indicative of the future rather than highly reliable prognostications.

2. Population Growth

Population in the study area has shown a continual increase since 1950. From 1950 to 1970 the rate of increase for Cochise County was 96 percent while Pinal County increased in population 57 percent. Components of change, which consider natural increases in population and net migration, show that from April 1, 1970, to July 1, 1978, Cochise County increased by 8,200 or 13.2 percent, while Pinal County increased by 10,400 or 15.2 percent. During this same period of time the State increased by 585,600 or 33.0 percent. Population growth in Cochise County during the 1950-1970 years is partially attributed to the expansion of the military role of Fort Huachuca near Sierra Vista. Overall, the growth rate in the study area has been much slower than the growth rate for the State.

Both Cochise and Pinal Counties are projected to exceed 100,000 population by the year 2000. The percentage rate of increase is substantially

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below that projected for the State. Table 10 presents the projection comparisons for the two-county area and the State.

Table 11 presents a comparison of population in Arizona and in Cochise and Pinal Counties by age as of July 1, 1978. The large number of persons over the age of 60 indicates the area is attractive to retirees. Retirement communities are becoming increasingly important to the local economy. Mild climate and lack of severe weather changes, as well as access to the metropolitan area of Tucson, will continue to promote the development.

The population classifications shown in Table 12 show a tendency for immigration to established communities in Cochise and Pinal Counties. Rural farm population is declining. Between 1950 and 1960 rural farm population underwent a large decline in both counties. Based upon 1972 OBERS Projections, by the year 2020 the urban and rural nonfarm population trend will continue to increase while the rural farm will remain essentially at its present figure. Table 13 presents historical trends for the four-county area.

3. Agriculture

Rural farm population has declined primarily due to advances in agricultural technology which require fewer agricultural workers. Agricultural marketing, however, remains a substantial source of income in the study area. Table 14 shows the dollar value of cash receipts to

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Table 10. - Comparison of Arizona Counties in Study Area, State of Arizona, and U.S. Projections, 1970 to 2000*

County, State, & U.S. Comparisons	April 1, 1970	1980 Estimate	Change 1970 to 1980 Amount (000)	%	1985 Estimate	Change 1970 to 1985 Amount (000)	%	1990 Estimate	Change 1970 to 1990 Amount (000)	%	1995 Estimate	Change 1970 to 1995 Amount (000)	%	2000 Estimate	Change 1970 to 20 Amount (000)	
Cochise County	61.9	84.4	22.5	36.3	96.2	34.3	55.4	108.6	46.7	75.4	117.9	56.0	90.5	124.3	62.4	10
Pima County	351.7	539.8	188.1	53.5	606.3	254.6	72.4	655.5	303.8	86.4	727.1	375.4	106.7	818.6	466.9	13
Pinal County	68.6	92.5	23.9	34.8	97.7	29.1	42.4	106.7	38.1	55.5	117.5	48.9	71.3	127.7	59.1	8
Santa Cruz County	14.0	20.1	6.1	43.6	23.6	9.6	68.6	27.0	13.0	92.9	30.1	16.1	115.0	33.0	19.0	13
Arizona	1,775.4	2,701.0	925.6	52.1	3,011.0	1,235.6	69.6	3,395.0	1,619.6	91.2	3,786.0	2,010.6	113.2	4,280.0	2,504.6	14
United States	204,833.5	221,651.0	16,817.5	8.2	232,371.0	27,537.5	13.4	243,004.0	38,170.5	18.6	252,241.0	47,407.5	23.1	259,869.0	55,035.5	2

* Source: Population estimates of Arizona as of July 1, 1978, Arizona Department of Economic Security, Report No. 11, pp. 46-50.

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Table 11. - Population of Arizona, Two-county and Four-county Study Area as of July 1, 1978*

Area	Age Group							
	9 & under	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 59	60 & over
Cochise County	14,850	5,975	9,525	7,925	10,575	7,850	10,575	18,875
Pinal County	16,450	8,075	9,925	9,825	9,950	8,450	12,825	20,700
2-county Total	31,300	14,050	19,450	17,750	20,525	16,300	23,400	39,575
4-county Total	116,250	53,475	66,650	71,275	113,025	71,475	95,875	171,850
% of 2-county Total	17	8	10	10	11	9	13	22
% of 4-county Total	15	7	9	9	15	9	13	23
Arizona	447,950	204,025	251,575	262,525	389,375	266,625	351,325	649,675
% of State Total	16	7	9	9	14	9	13	23

* Population estimates of Arizona as of July 1, 1978, Arizona Department of Economic Security, Report No. 11, pp. 10-13.

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Table 12. - 1978 Population and Historical Trends for Two-county and Four-county Study Area, State of Arizona, and United States 1/

Area	Year (000's)				Percent Increase		
	1950	1960	1970	July 1, 1978 2/	1950-1960	1960-1970	1970-1978
Cochise County	31.5	55.0	61.9	78.2	74.6	12.5	26.3
Pinal County	43.2	62.7	67.9	87.5	45.1	8.3	28.9
2-county Total	74.7	117.7	129.8	165.7	57.6	10.3	27.7
4-county Total	225.2	394.2	495.5	687.5	75.0	25.7	38.7
Arizona	750.0	1,302.2	1,775.4	2,547.0	73.6	36.3	43.5
United States	151,325.8	179,322.2	203,211.9	NA	18.5	13.3	NA

1. Source: U.S. Census; U.S., Statistical Abstract of the United States. 1972, p. 5.

2. Population estimates of Arizona as of July 1, 1978, Arizona Department of Economic Security, Report No. 11, pp. 2-3.

FCSPRNCA0784

Table 13. - Population Classified Urban and Rural
Historical Trends - 1950 to 1970
(Four-county Area) 1/

County and Residence Type	Number in Thousands			Percent		
	1950	1960	1970	1950	1960	1970
Cochise County 2/						
Urban	15.9	24.9	39.9	50.4	45.3	64.4
Rural nonfarm	12.2	27.5	19.6	38.6	50.0	31.7
Rural farm	3.5	2.6	2.4	11.0	4.7	3.9
Total	31.5	55.0	61.9	100.0	100.0	100.0
Pima County 2/						
Urban	78.3	234.5	299.9	55.3	88.3	85.3
Rural nonfarm	55.5	28.4	47.7	39.4	10.7	13.6
Rural farm	7.4	2.8	4.0	5.3	1.0	1.1
Total	141.2	265.7	351.7	100.0	100.0	100.0
Pinal County 2/						
Urban	90.4	262.1	332.4	49.0	79.8	79.2
Rural nonfarm	73.5	56.5	77.0	39.9	17.2	18.4
Rural farm	20.5	9.8	10.1	11.1	3.0	2.4
Total	184.4	328.4	419.6	100.0	100.0	100.0
Santa Cruz County 2/						
Urban	6.1	7.3	8.9	65.7	67.4	63.9
Rural nonfarm	2.2	2.8	4.4	24.0	26.1	31.7
Rural farm	1.0	0.7	0.6	10.3	6.5	4.4
Total	9.3	10.8	14.0	100.0	100.0	100.0

1. Source: U.S. Census and Santa Cruz-San Pedro River Basin, Resource Inventory, Soil Conservation Service, August 1977, p. 3.9.

2. Items may not add to totals due to rounding.

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Table 14. - Cash Receipts from Agricultural Marketing
1975, 1976, and 1977 (Four-county Area) 1/
($000)

County	Crops			Livestock and Livestock Products			Total Crops and Livestock		
	1975	1976	1977	1975	1976	1977	1975	1976	1977
Cochise	33,360	44,836	34,504	15,742	18,919	22,561	49,102	63,755	57,065
Pima	18,779	28,814	27,764	32,653	23,719	16,634	51,432	52,533	44,398
Pinal	87,821	140,712	119,005	163,191	162,997	125,452	251,012	303,709	244,457
Santa Cruz	447	556	509	4,303	4,687	5,530	4,750	5,273	6,039
2-county Total	121,181	185,548	153,509	178,933	181,916	148,013	300,114	367,464	301,522
4-county Total	140,407	214,918	181,782	215,889	210,322	170,177	356,296	425,270	351,959
2-county % of State Total	22	26	22	35	34	29	27	30	25
4-county % of State Total	26	31	26	43	39	33	34	34	29
State Total	542,651	702,375	689,670	505,163	537,515	508,729	1,047,814	1,239,890	1,198,399

1. Arizona Agricultural Statistics 1978, Arizona Crop and Livestock Reporting Service, Bulletin S-14, April 1979, p. 3.

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both Cochise and Pinal Counties for the years 1975, 1976, and 1977. Rankings within the State show Pinal County as second in total crops and livestock receipts, while Cochise County ranks fourth in the same category. Both counties raise a variety of crops including cotton, hay, wheat, barley, corn, sorghum, sugarbeets, and lettuce. Cash crop receipts vary from year to year depending upon weather, market prices, and production costs.

4. Employment

Government is the largest employer in the study area. A significant portion of this employment can be attributed to the expansion of Fort Huachuca in Cochise County. Educational facilities such as Central Arizona College near Casa Grande and Coolidge and Cochise College near Douglas account for additional numbers of government employees. Increases in government employment are typical of city growth and increased demand for services.

Wholesale and retail trade employment ranks as the second largest employer, followed by mining, services, agriculture, manufacturing, construction, and finance and real estate. Small numbers are employed in transportation, communication, and public utilities.

Metal mining has declined in the study area during the 1971-1975 period. Decreased copper prices and increased production costs forced some mine closings in the area. Agricultural employment has also decreased.

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5. Unemployment

Unemployment in the study area has averaged less than 1 percent above the State rate over the 1970-1977 period. Unemployment claims have decreased since 1977, which indicates improvement in economic conditions.

6. Income

In 1970, per capita income in Cochise County was $3,100 in 1967 dollars, while in the rest of the study area it was $2,905 in 1967 dollars. Estimated earnings in Cochise County in 1970 were 25 percent above the United States average but fell below the national average in the rest of the study area. Projected earnings per worker in Cochise County are expected to remain somewhat below national projections to the year 2020, while per capita income will maintain a close correlation to the United States projections to the same year. Projections for the rest of the study area are not available.

7. Farm Numbers and Size

In 1969, the study area had a total of 1,676 farms. Of the total, 713 were located in Cochise County and 494 in Pinal County. From 1959 to 1969 the number of farms declined in Cochise and Pinal Counties while the average size of a farm increased. This trend is likely to continue during most of the projection period. The major trend probably will be to larger commercial farms.

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8. Recreation

Demand for recreation activities and space has increased with population growth, increased leisure time, and improved financial status. The growth of retirement communities in the study area will place more pressure on surrounding recreational facilities. Little information is available on recreation and its impact upon the counties in the study area. The highest recreational use results from visitation from the local area and the SMSA's of Tucson and Phoenix. The nonresident utilization is less than would be common to the rest of the State. Such nonresident use is usually the result of visitation to national parks, monuments, or forests or travel through the area to other destinations.

Nonconsumptive recreational use activities in the project area include camping, picnicking, hiking, swimming, rafting, four-wheeling, rock and mineral collecting, sightseeing, and nature study. Consumptive recreational use in the area includes hunting and fishing. Deer are the most important big game animals in the area. Other game species include javelina, turkey, antelope, bighorn sheep, elk, bear, rabbit, quail, and dove. Wildlife numbers are dependent upon water and cover for continued existence and will face increased hunting pressure from increased area population. Wildlife expenditures for consumptive and nonconsumptive uses in the study area are estimated at an annual figure of $2,964,400 over the 1971-1974 period.

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IV. ENVIRONMENTAL CONSEQUENCES

The proposed acquisition of the San Pedro River area for inclusion in the National Wildlife Refuge System would have both direct and indirect environmental impacts. Most of the impacts would be locally significant but the impact upon the wildlife would be significant nationally and internationally, as well as locally.

A. Impact on Climate

Acquisition of the project area for inclusion in the National Wildlife Refuge System would have no impact upon climate.

B. Impact on Air Quality

Providing the public with the opportunity for nature interpretive studies and educational wildlife research through fee acquisition could result in increased vehicular traffic to the area. Any effects from such additional traffic would be temporary and of negligible impact. No adverse effects upon air quality would result from acquisition of the proposed refuge area.

C. Impact on Geology and Soils

Designation of the area as a national wildlife refuge would in effect restrict further land clearing, preserve the natural vegetation, and

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maintain the integrity of the proposed refuge area as a valuable watershed. No adverse effects are foreseen upon either the geology or soils of the proposed refuge area.

D. Impact on Energy and Mineral Resources

Present mining activity on the proposed refuge area is limited to extraction of sand and gravel. Mining activity in the surrounding area has been taking place since the late 1800's. Such activity has fluctuated considerably, subject to the vagaries of market demand and production costs. Increases in the price of minerals will undoubtedly focus attention on the study area. Recent studies indicate the possibility of geothermal development also exists in the southeastern part of the State.

All mineral and geothermal operations on the refuge would be required to comply with applicable Federal and State laws and regulations for the protection of wildlife and administration of the area.

E. Impact on Water Resources

Surface water in the proposed refuge area has undergone some degradation due to water runoff from cultivated areas and resultant increased salinity levels. Acquisition of the proposed refuge area in fee would eliminate this condition and allow the waters to return to a more nearly pristine condition.

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Acquisition of the proposed refuge in fee would result in erosion control and decrease sediment deposition in the river. The quality of the surface water supply would be enhanced. The Charleston Dam, proposed by the Bureau of Reclamation for impoundment of surface water to be used as a municipal and industrial water supply for Tucson, has been approved for construction. This damsite, on the San Pedro River north of Sierra Vista and at the small settlement of Charleston, would be within the refuge area. The project has been removed from the authorized list by Presidential order and the proposed dam is now being held in abeyance.

The main source of water in the study area is ground water and this supply is being withdrawn at a rate in excess of recharge capability. Continued agricultural development and land clearing would impose even greater water needs upon an already depleted supply. Continued population growth will pose a greater need for existing water supplies to satisfy domestic needs and sanitation purposes.

Placing of the proposed area in the National Wildlife Refuge System will have no adverse effect or impact upon the existing water supply or water quality. In fact, water resources now in existence might be of higher quality and increased supply than at present.

F. Impact on Vegetation

The acquisition of the project lands in fee or easement would insure the preservation of floral communities and individual plant species.

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Without the project proposal the vegetation would continue to be affected and probably significantly altered in the next 10 years to convert the land to more profitable economic uses.

A comprehensive management plan for the proposed San Pedro National Wildlife Refuge has not been formulated and, therefore, little can be said about the impact of Fish and Wildlife Service management on vegetation or any other parameter. However, the refuge will be managed in such a way that protection of both the flora and fauna will be of the highest priority.

G. Impact on Wildlife

Impacts beneficial to wildlife would accrue with the beneficial impacts to vegetation previously discussed. Acquisition of the area as a national wildlife refuge will prevent commercial, residential, or agricultural development of the property and concomitant loss of wildlife. Control of public use and regulation of public access according to the regulations under which national wildlife refuges are administered also are designed to protect wildlife species and their habitat from abuses that might occur on private lands. The principal impact of our proposed action will be the preservation of the unique riparian and grassland habitats and wildlife species along the San Pedro River.

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H. Impact on Archeological and Historical Resources

The acquisition of the proposed refuge area would preserve the valuable cultural resources remaining in this archeological zone. Such acquisition would not endanger any of the known or unknown archeological or historical properties. One historical site (Quiburi) is presently listed on the National Register of Historic Places.

The acquisition of the project area and inclusion in the National Wildlife Refuge System would have no adverse impact upon the archeological and historical values in the area. Further studies should be made to identify and protect as many cultural resources as possible. Professional archeological research projects would be encouraged in keeping with refuge management and administration policies.

Pursuant to 36 CFR 800.4, the Fish and Wildlife Service shall provide the State Historic Preservation Officer and the Advisory Council on Historic Preservation with an opportunity to comment on this undertaking. This document will serve as the notification to the State Historic Preservation Officer and the Advisory Council on Historic Preservation as provided under 36 CFR 800.9. These agencies shall be notified in cover letters circulated with this document.

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I. Impact on Land Use

There would be no change under national wildlife policy in honoring all existing land commitments, including legal rights-of-way and mineral exploration/extraction rights, which have been retained through previous ownership.

In the case of the grassland corridor, extending laterally from the river to the base of the Huachuca Mountains to the west, land use potential would be substantially changed. This particular section is subject to extensive residential-type development. Access to nearby transportation routes makes the area attractive for nonfarm rural development. The land clearing associated with such development will result in an irretrievable and irreversible impact on the fragile ecology and habitat now existent in the grassland corridor. A portion of the grassland corridor has already undergone such change. The acquisition of the grassland corridor and placement under national wildlife refuge administration would permit this unique habitat to continue to exist in its present state and prevent further irretrievable and irreversible damage to the land.

By acquiring the project area as a wildlife refuge, the future conversion of approximately 10,000 acres of land to agricultural use would be denied. Also, the acquisition of the grassland corridor would eliminate conversion of this prime wildlife habitat to residential usage.

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The acquisition of the project area and the placing of the area under national wildlife refuge management would in itself have no adverse impact upon the land. This proposed status quo land use would not affect land use policies of other landowners in the study area.

J. Impact on Socioeconomics

Federal fee simple acquisition of the proposed refuge area would displace some families now residing on the property. It is assumed their employment with Tenneco West, Inc., or the leasee of the land would continue at other owned or leased properties. In the event their employment was not continued and they should become unemployed, their status would constitute an adverse impact upon the local economy. The administration of the area as a wildlife refuge should provide sufficient employment opportunities to offset any adverse local unemployment impacts resulting from sale of the land. Loss of local income generated by sales and services to existing tenants would be offset by sales of goods and services necessary to maintain refuge administration.

Adverse economic impacts, of a potential nature, would be associated with future development of the area. Acquisition of the area as a national wildlife refuge would limit potential future economic development of the area by preventing residential, commercial, private, or agricultural development on the refuge. This would not be a limiting factor of great magnitude since sufficient land is available in adjacent areas for continued development. The presence of a refuge would

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probably enhance the value of such adjacent lands due to the scenic preservation and potential attraction to visitors.

The immediate major adverse economic impact resulting from the acquisition of the area as a national wildife refuge would come from preventing agricultural development on the refuge. Tentative plans are to clear approximately 10,000 acres of flood plain land and convert to cash crop usage. Conversion of the grassland corridor to nonfarm residential development would take place over a longer time span but the adverse economic impact would be greater than that associated with the cessation of agricultural development.

Federal landholdings are tax exempt so lands acquired by the U.S. Fish and Wildlife Service in fee title would be removed from the tax rolls in Cochise County. For those lands that are acquired in fee title, the county would receive an annual payment, in lieu of taxes, in accordance with the provisions of the Refuge Revenue Sharing Act (16 U.S.C. 715s: 49 Stat. 383, as amended). This annual payment would far exceed current tax payments. This Act was designed to insure that the local government did not suffer a tax loss due to land being acquired for refuge purposes. If the land were acquired under an easement, these revenue sharing funds would not be available because the land would remain on the tax rolls. The terms of the Refuge Revenue Sharing Act are specified in the Appendix.

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V. CONSULTATIONS AND CONTACTS

Agency or Institution	Person Contacted (If Appropriate)
Arizona Crop and Livestock Reporting Service, USDA	Horace Mayes
Arizona Game and Fish Department	Numerous Personnel
Arizona Office of Economic Planning and Development	Office Secretary
Arizona State Highway Department	Robert Murphy (Senior Planner)
Arizona State Parks Department	Patricia Bergthold (Natural Areas and Trails Coordinator)
Arizona State University	Richard L. Glinski (Staff Research Biologist)
Arizona State University	Jack Sanders (Professor)
Arizona Wildlife Federation	Gary L. Monica (President)

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Agency or Institution	Person Contacted (If Appropriate)
	Gayle Carnes (Private Citizen)
	Judy Dykes (Private Citizen)
	Harold A. Elliott (Private Citizen)
	Janet M. Giron (Private Citizen)
Huachuca Conservation Council	Jerome J. Pratt (Secretary-Treasurer)
Huachuca Audubon Society	Douglas and Natalie Danforth
	Susan Keith (Private Citizen)
	Virginia Labor (Private Citizen)
Magma Copper Company	Howard Twitty (Attorney)
Maricopa Audubon Society	Robert A. Witzeman (President)

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Agency or Institution	Person Contacted (If Appropriate)
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	William A. Meeks (Private Citizen)
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National Rifle Association	Mary Peterson (Field Representative)
Raptor Research Foundation	
	Ken Rosenberg (Private Citizen)
San Pedro Research Conservation District	George Hopper (Chairman)
	Linwood Smith (Consulting Biologist and Past Chairman, Arizona Natural Areas Committee)

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Agency or Institution	Person Contacted (If Appropriate)
Southwestern Hawk Watch	Walter and Sally Spofford (Retired Biologists)
State of Arizona Department of Economic Security	Jack Kronenfeld (Economist)
The Nature Conservancy Arizona Committee	William G. Roe
The Nature Conservancy Arizona Committee	Virgil Rule (Chairman)
The Nature Conservancy California Field Office	Peter Seligman (Director)
The University of Arizona	Boyd Kynard, Jr. (Professor)
The University of Arizona	Paul S. Martin (Professor)
The University of Arizona - Office of Arid Land Studies	David A. Mouat (Program Director)

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Agency or Institution	Person Contacted (If Appropriate)
The University of Arizona	Michael L. Rosenzweig (Professor)
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U.S. Bureau of Reclamation, Boulder City	Adrian Hutchens (Economist)
U.S. Bureau of Reclamation, Project Office	Steve Magnussen (Project Manager)

FCSPRNCA0802

Agency or Institution	Person Contacted (If Appropriate)
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U.S. Representative - Arizona	Honorable John J. Rhodes
U.S. Senator - Arizona	Honorable Dennis De Concini
U.S. Senator - Arizona	Honorable Barry Goldwater
U.S. Soil Conservation Service	Roy Ard (District Conservationist)
U.S. Soil Conservation Service	Ron Ward
	Ronald N. Vanover (Private Citizen)

FCSPRNCA0803

Agency or Institution	Person Contacted (If Appropriate)
	Jeffrey Zimmerman (Private Citizen)

During the period January and February 1978, numerous contacts were made with persons from the news media. Subsequent to these contacts, many articles were published both within the State of Arizona and the Southwest, and references were made in coverage by television and radio stations. These media sources were too difficult to document.

FCSPRNCA0804

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APPENDIX

FEDERAL LAWS AND REGULATIONS APPLICABLE TO MANAGEMENT OF FISH AND WILDLIFE RESOURCES

Section 10 of the River and Harbor Act approved March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403) prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The construction of any structure in or over any navigable water of the United States, the excavation from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters are unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. The authority of the Secretary of the Army to prevent obstructions to navigation in the navigable waters of the United States was entended to artificial islands and fixed structures located on the Outer Continental Shelf by Section 4 of the Outer Continental Shelf Lands Act of 1953 (67 Stat. 463; 43 U.S.C. 1333 (f.)).

Refuge Trespass Act of June 28, 1906 (18 U.S.C. 41; 43 Stat. 98, 18 U.S.C. 145). Provided first Federal protection for wildlife on national wildlife refuges. The Act made it unlawful to hunt, trap, capture, willfully disturb or kill any bird or wild animal, or take or destroy the eggs of any such birds or any lands of the United States set apart or reserved as refuges or breeding grounds for such birds or animals by any law, proclamation, or executive order, except under rules and regulations of the Secretary. The Act also protects Government property on such lands.

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Antiquities Act of 1906 (34 Stat. 225). Provided for protection of artifacts and historical objects and their recovery by accredited institutions.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 50 CFR Subchapter B), as amended. Implements treaties with Great Britain (for Canada) and Mexico for protection of migratory birds whose welfare is a Federal responsibility; provides for regulations to control taking, possessing, selling, transporting, and importing of migratory birds and provides penalties for violations.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715s, 45 Stat. 1222), as amended. Authorizes acquisition, development, and maintenance of migratory bird refuges; cooperation with other agencies in conservation; and investigations and publications on North American birds. Authorizes the payment of 25 percent of net receipts from administration of national wildlife refuges under the primary jurisdiction of this Bureau to the county or counties in which such refuges are located.

Migratory Bird Hunting Stamp Act of 1934 (16 U.S.C. 718-718h; 48 Stat. 451), as amended. Requires that all waterfowl hunters, sixteen (16) years of age or older, possess a valid "duck stamp"; required use of "duck stamp" net revenue to acquire migratory bird refuges and waterfowl production areas.

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Criminal Code Provisions of 1940, as amended (18 U.S.C. 41). States the intent of Congress to protect all wildlife within Federal sanctuaries, refuges, fish hatcheries, and breeding grounds, and provides that anyone except in compliance with rules and regulations promulgated by authority of law, who hunts, traps, or willfully disturbs any such wildlife, or willfully injures, molests, or destroys any property of the United States on such land or water shall be fined up to $500.00 or imprisoned for not more than six (6) months or both.

Bald Eagle Act of 1940 (16 U.S.C. 668-668d; 54 Stat. 250; 50 CFR Subchapter 8), as amended. Provides for protection of the bald eagle (the national emblem) and the golden eagle.

Fish and Wildlife Act of 1956 (70 Stat. 1119; 16 U.S.C. 742a-742J), as amended. Approved August 8, 1956, this Act established a comprehensive fish and wildlife policy and directed the Secretary to provide continuing research; extension and information service; and directed development, management, and conservation of fish and wildlife resources.

Fish and Wildlife Recreation Act of 1962 (Public Law 87-114; 76 Stat. 653-654; 16 U.S.C.). Authorizes appropriate, incidental, or secondary recreational use on conservation areas administered by the Secretary of the Interior for fish and wildlife purposes.

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Wilderness Preservation and Management (50 CFR 35; 78 Stat. 890; 16 U.S.C. 1131-1136; 43 U.S.C. 1201). Provides procedures for establishing wilderness units under the Wilderness Act of 1964 on units of the National Wildlife Refuge System.

Land and Water Conservation Fund (LWCF) Act of 1965. This act provides financial assistance to the states for outdoor recreation, primarily in (1) planning; (2) acquisition of land, waters, or interests in land or waters; or (3) development.

In addition to assistance to the states, the LWCF Act also provides that not less than 40 percent of the annual appropriation shall be available for Federal purposes. Moneys appropriated from the fund for Federal purposes shall be made available for the acquisition of land, waters, or interests in land or waters for the (1) National Park System, (2) National Forest System, (3) National Wildlife Refuge System, and (4) Bureau of Land Management.

The appropriations provided by the LWCF Act are derived from Outer Continental Shelf leases, tax on motorboat fuels, and sale of certain surplus Federal lands. The Act also increases Land and Water Conservation Fund authorization for FY 1978 and following years through FY 1989.

The U.S. Fish and Wildlife Service utilizes four basic acquisition authorities which are allowed through the funding authority of the LWCF

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to purchase land and water, including (1) Endangered Species Act of 1973; (2) Recreation Act of 1962; (3) Fish and Wildlife Act of 1956, except for migratory waterfowl areas; and (4) any areas authorized as additions to the National Wildlife Refuge System by specific Congressional Acts.

The U.S. Fish and Wildlife Service, using existing acquisition authorities and the funding authority of the LWCF, will identify and purchase areas of land and water defined as either "nationally significant wildlife ecosystems" or "unique wildlife ecosystems."

National Historic Preservation Act of 1966 (16 U.S.C. 470-470b, 470c-470n, 80 Stat. 915), as amended. This Act provides for the preservation of significant historical features (buildings, objects, etc.) through a grant-in-aid program to the states. Establishes a National Register of Historic Places. Federal agencies are required to take into account the effects of their actions on buildings, etc., included or eligible for inclusion on the National Register.

National Wildlife Refuge System Administration Act of 1966 (Public Law 89-669; 80 Stat. 929; 16 U.S.C. 668dd-668ee), as amended. Consolidates the authorities for the various categories of areas previously established that are administered by the Secretary of the Interior for the conservation of fish and wildlife including species that are threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, etc., which are

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hereby designed as the National Wildlife Refuge System. Provides, according to the Act, that the Secretary may authorize hunting and fishing to the extent practicable and consistent with state fish and wildlife laws and regulations.

The National Environmental Policy Act of 1969, NEPA (42 U.S.C. 4321-4347) declares the national policy to encourage a productive and enjoyable harmony between man and his environment. Section 102 of that Act directs that "to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) all agencies of the Federal Government shall . . . insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations . . . ."

Section 102(2)c of the National Environmental Policy Act requires all Federal agencies, with respect to major Federal actions significantly affecting the quality of the human environment, to submit to CEQ a detached statement on:

(i) The environmental impact of the proposed action;

(ii) Any adverse environmental effect which cannot be avoided should the proposal be implemented;

(iii) Alternatives to the proposed action;

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(iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity;

(v) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Rights-of-Way General Regulations (50 CFR 29.21; 34 FR 19907, December 19, 1969). Provides for procedures for filing applications and the terms and conditions under which rights-of-way over, above, and across lands administered by the Bureau may be granted.

Use of Off-Road Vehicles on Public Lands (Executive Order 11644, Federal Reg. Vol. 37, No. 27, February 9, 1972). Provides policy and procedures for regulating off-road vehicles.

Section 401 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500; 86 Stat. 816, 33 U.S.C. 1411) requires any applicant for a Federal license or permit to conduct any activity which may result in a discharge into navigable waters to obtain a certification from the state in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility.

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Section 404 of the Federal Water Pollution Control Act of 1972 (Public Law 92-500, 86 Stat. 816) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material into the navigable waters at specified disposal sites. The selection of disposal sites will be in accordance with guidelines developed by the Administrator of the Environmental Protection Agency (EPA) in conjunction with the Secretary of the Army. Furthermore, the Administrator can prohibit or restrict the use of any defined area as a disposal site whenever he determines, after notice and opportunity for public hearings, that the discharge of such materials into such areas will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas.

Endangered Species Act of 1973 and recent amendments (16 U.S.C. 1531-1543; 87 Stat. 884), as amended. This Act provides for the conservation of threatened and endangered species of fish, wildlife, and plants by Federal Action and by encouraging state programs. Specific provisions include: (1) authorizes the listing and determination of critical habitat of endangered and threatened species and requires consultation with the Fish and Wildlife Service on any federally funded or licensed project that could affect any of these agencies; (2) prohibits unauthorized taking, possession, sale, transport, etc., of endangered species; (3) authorizes an expanded program of habitat acquisition; (4) authorizes the establishment of cooperative agreements and grants-in-aid to states which establish and maintain an active, adequate program for

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endangered and threatened species; and (5) authorizes the assessment of civil and criminal penalties for violating the Act or regulations.

Refuge Revenue Sharing Act of 1978 (Public Law 95-469, approved October 17, 1978, which amended 16 U.S.C. 715s; 50 CFR, Part 34). This Act changes the provisions for sharing revenues with counties in a number of ways. It makes revenue sharing applicable to all lands administered by the U.S. Fish and Wildlife Service, whereas previously it was applicable only to areas in the National Wildlife Refuge System. The new law makes payments available for any governmental purpose, whereas the old law restricted the use of payments to roads and schools. For fee (acquired) lands, the new law provides a payment of 75¢ per acre, 3/4 of 1 percent of fair market value, or 25 percent of net receipts, whichever is greater, whereas the old law provided a payment of 3/4 of 1 percent adjusted cost or 25 percent of net receipts, whichever was greater. The new law makes reserve (public domain) lands entitlement lands under Public Law 94-565 (16 U.S.C. 1601-1607), and provides for a payment of 25 percent of net receipts. The new law authorizes appropriations to make up any short-fall in net receipts to make payments in the full amount for which counties are eligible. The old law provided that if the net receipts were insufficient to make the full payment, the payment to each county would be reduced proportionately.

National Wildlife Refuge Regulations for the most recent fiscal year (50 CFR 25-35, 43 CFR 3103.2 and 3120.3-3). Provides regulations for administration and management of wildlife refuge areas including mineral leasing, exploration, and development.

FCSPRNCA0822

DEPARTMENT OF THE INTERIOR

LAND PROTECTION PLAN

DRAFT

SAN PEDRO RIVER

Prepared by:
U.S. Fish and Wildlife Service
Region 2
Albuquerque, New Mexico
December 12, 1985

FCSPRNCA0823

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I. PURPOSE

The U.S. Fish and Wildlife Service (FWS) proposes to secure permanent protection of the San Pedro River and its environs in Cochise County, Arizona. Cochise County is located in the extreme southeastern part of the state and lies adjacent to the State of Sonora, Mexico. The river, its riparian habitat, and the desert lands which border it represent an irreplaceable biotic complex of national and international significance. This plan presents an analysis of the various alternative methods to preserve and protect all key habitats of these biotic communities, and discusses in detail ongoing actions designed to protect specific areas now or soon to be available for FWS acquisition.

The lands and waters under consideration for protection lie in an area bounded by Interstate Highway 10 on the north, the United States-Mexico border on the south, the Huachuca Mountains rising on the west, and Highway 80 on the east (Figure 1). Within this general area some 50,000 acres have been identified to date which contain key habitat types of critical concern to the preservation of the system as a whole. As noted in the November 21, 1985, Federal Register (Vol. 50, No. 225, pg. 48137), the U.S. Bureau of Land Management proposes to acquire 44,000 acres (Figure 2) lying within the 50,000-acre area of FWS concern through a land exchange program to be concluded in the immediate future. This document will address FWS withdrawal of those lands and establishment of a National Wildlife Refuge as the preferred alternative of protection for these lands following transfer to Federal ownership.

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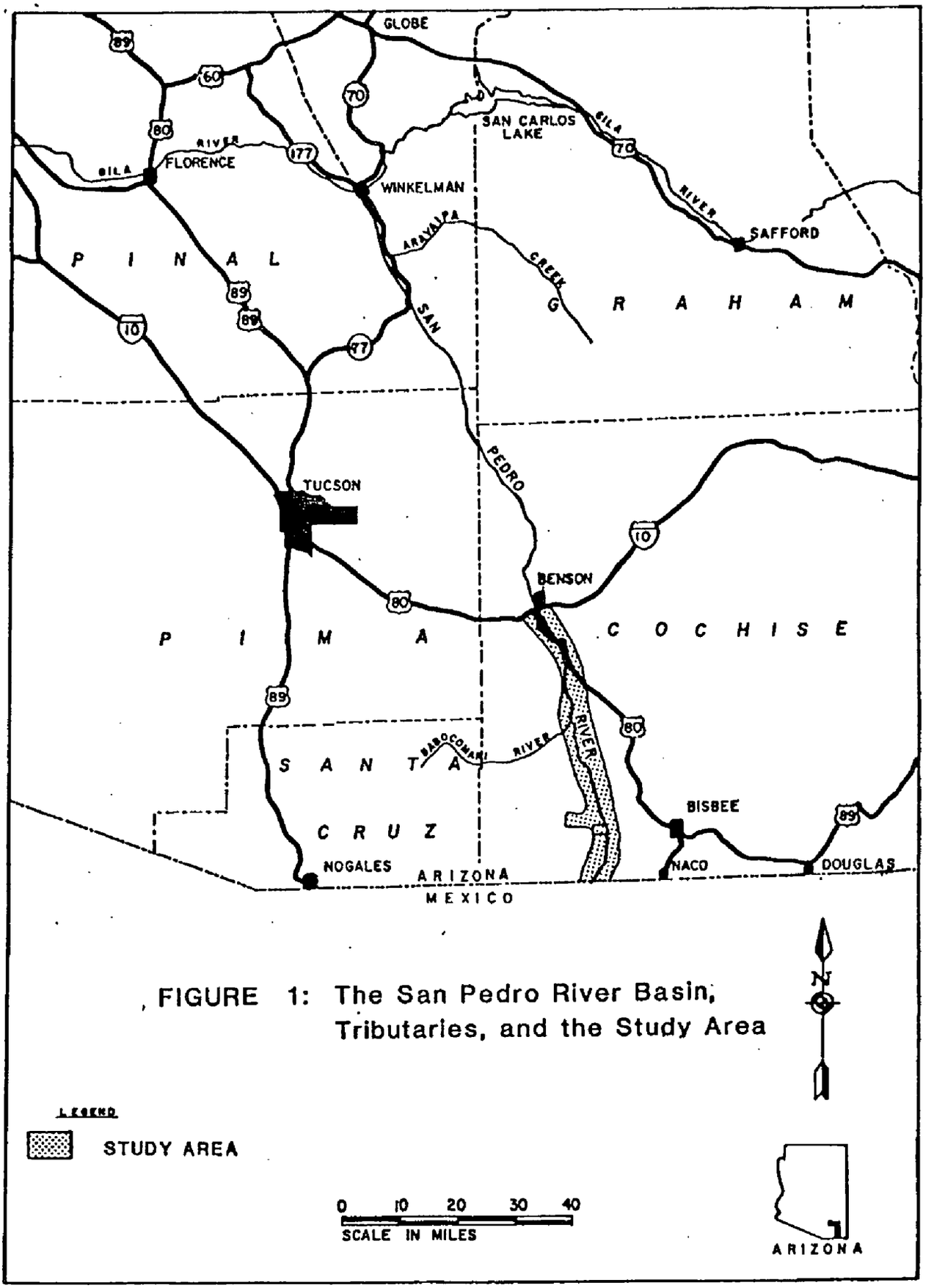

FIGURE 1: The San Pedro River Basin, Tributaries, and the Study Area

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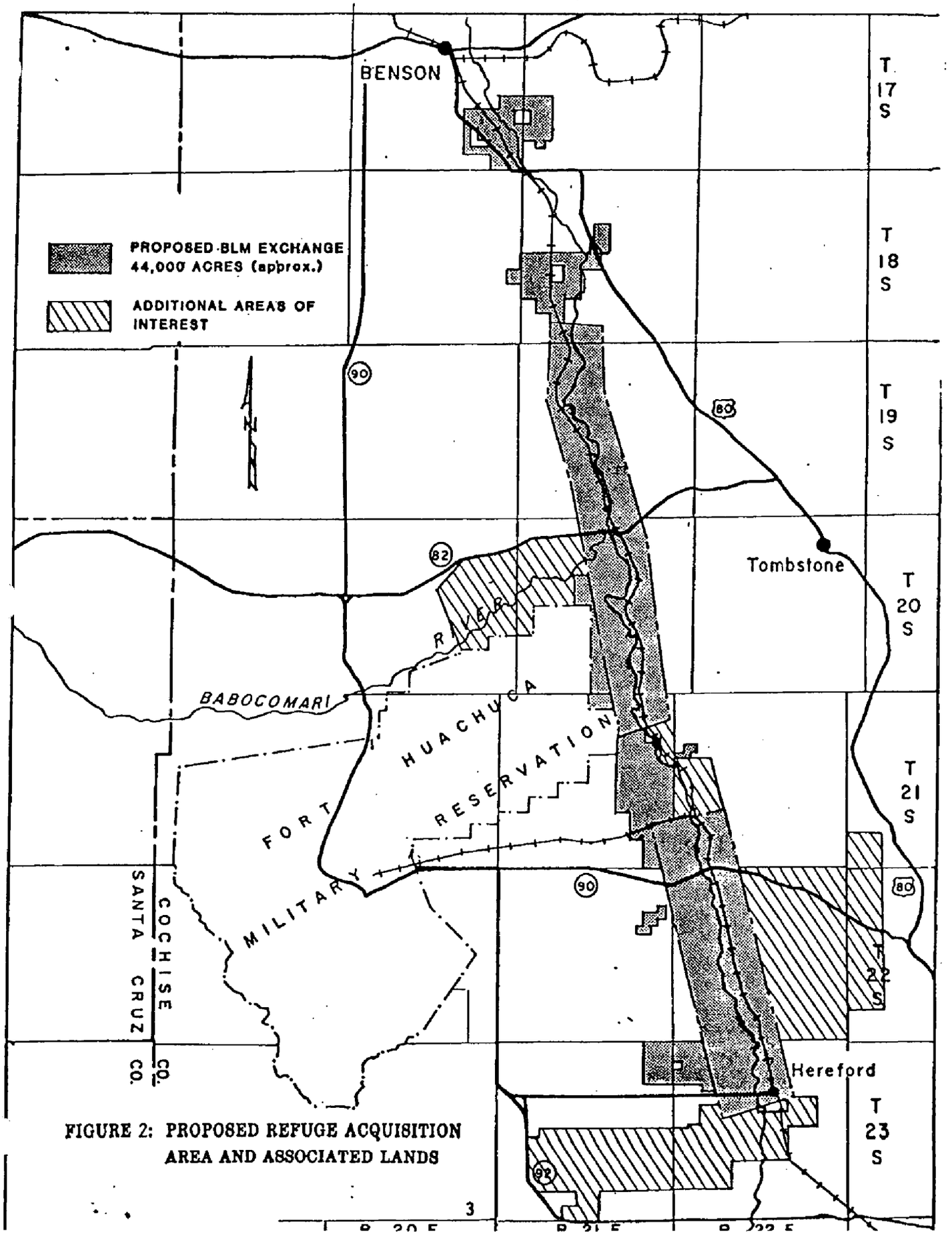

FIGURE 2: PROPOSED REFUGE ACQUISITION AREA AND ASSOCIATED LANDS

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Due to their very nature and location, riparian habitats are more vulnerable to loss than other plant communities. Clearing for agricultural purposes, urbanization, modification of natural drainage ways and vegetative manipulation result in direct losses in this habitat--not only in numbers of acres destroyed, but in reduced vigor and stability of the disjunct patches left standing. Changes in riparian vegetation and the wildlife communities dependent upon that vegetation, have also been indirectly caused through the lowering of the near surface groundwater table by overdraft pumping. Such vulnerability to loss is exacerbated by the extremely restricted occurrence of riparian communities. It is estimated that natural riparian communities make up less than two percent of the land area of the U.S. (U.S.D.I., FWS 1981). The distribution of that two percent is not however, uniform throughout the nation. The arid southwestern region of the United States is characterized by its very lack of such communities. Western Texas, southern New Mexico and Arizona, and southeastern California mark the convergence of three major desert systems (Chihuahuan, Sonoran, and Mojave). The Salt-Gila River System, traversing the breadth of Arizona to the Colorado River, the lower portions of the Colorado to its mouth in the Gulf of California and the Rio Grande-Pecos Rivers in New Mexico and Texas, form the major perennial drainages within the southwest (Figure 3). These river systems share many commonalities in both habitat values and in losses of those values incurred since the development of the region.

The structural complexity of these ecosystems, particularly in juxtaposition with uplands in this arid region, the presence of flowing water, relatively

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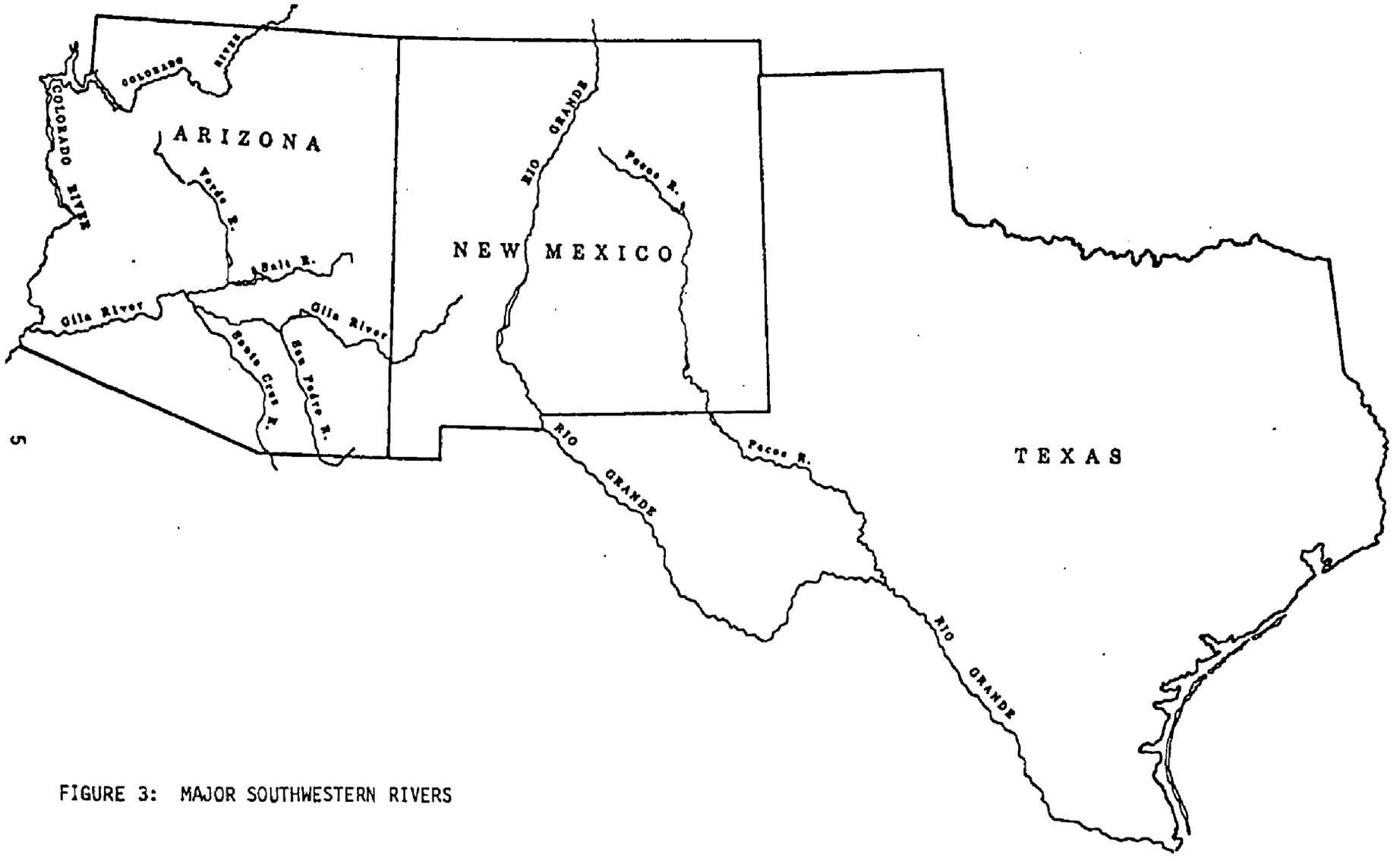

FIGURE 3: MAJOR SOUTHWESTERN RIVERS

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high plant productivity, and the habitat diversity gradient over small topographic differences (such as the change from open water stream channel to a dense gallery forest), are attributes that result in rich wildlife communities inhabiting these systems, both as residents and as migrants. The linear nature of riparian ecosystems provides distinct corridors that are important as migration and dispersal routes and as forested connectors between habitats for birds and both large and small mammals. The general north-south orientations of the major southwestern rivers (Pecos, Rio Grande, Colorado) and their few permanent tributaries have created travel corridors linking habitats of the United States with those of Mexico.

The Rio Grande flows south through the center of New Mexico to eventually form the international boundary between the U.S. and Mexico, from El Paso to Brownsville, Texas. The Pecos River also flows south through New Mexico, roughly paralleling the Rio Grande until the two rivers join on the U.S.-Mexico border. In Arizona, all major desert streams flow first to the Gila River and then feed the Colorado River flowing south from its Colorado headwaters to the Gulf of California. The south flowing Verde merges with the Salt River en route to the Salt's confluence with the Gila. Two rivers join the Gila from the south-the San Pedro and Santa Cruz which flow north from their Mexican headwaters to southern Arizona and the Gila. These north-south corridors act not only as travel paths but as extensions of suitable habitat for plants and animals at the periphery of their ranges.

As valuable as these rivers and their associated habitats are to the maintenance of southwestern biotic diversity, they have undergone radical changes

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in wildlife values since the onset of western development. Reservoir construction with subsequent changes in flow patterns and nutrient transport, water diversion, groundwater pumping, and vegetative manipulation have all influenced the amount and timing of flows in these rivers to varying extents. Introductions of non-native plants and animals have altered native communities. Concentration of agricultural, municipal and industrial development in river valleys has reduced or destroyed both terrestrial and aquatic wildlife habitats. The effects of these impacts have been severe (Ohmart 1985). The Rio Grande has lost native riparian habitats through land clearing and conversion to other uses, reservoir impoundment and competition from exotics until this river supports only 20 percent of its original flora along its length. Similar impacts have reduced riparian habitat on the Pecos River by 95 percent. The lower Colorado now supports less than 10 percent of its estimated historic native riparian flora; the Gila, 10 percent; and the Santa Cruz, 15 percent. Only the Salt (20 percent), the Verde (60 percent), and the San Pedro (75 percent) Rivers retain significant stands of native riparian communities.

The San Pedro River, supporting one of the largest stretches of natural riparian river habitat remaining in the southwest, provides an irreplaceable resource. Its location, north-south orientation, and habitat quality have made the San Pedro River and surrounding lands a major transportation corridor for migrating species shared by the United States and Mexico. The riparian corridor supports breeding individuals of raptors in combinations and densities found nowhere else in the nation. These aspects of the diversity and abundance of wildlife dependent upon the San Pedro River would be irretrievably lost if

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the area loses protection and is developed or if it is managed for any goal less than optimum habitat protection.

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II. METHODS AND ANALYSIS

The data used in the preparation of this plan were developed from existing files and documents such as the draft Environmental Assessment on Proposed Land Acquisition, San Pedro River National Wildlife Refuge (included herein by reference) and from individual studies and reports prepared by FWS staff and by private researchers. Photographs have been supplied by the Trust for Public Land, Southwest Regional Office. Because of limitations imposed by the landowner, no on-site field investigations have been conducted by FWS since initial field reconnaissance efforts.

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III. STATUS

The San Pedro River system was first identified as significant wildlife habitat by the FWS during the unique ecosystems planning efforts of the mid-1970's. The area was first considered for protection in the "Unique Wildlife Ecosystems Concept Plan - Arizona" (USFWS 1978). A draft environmental assessment was prepared on proposed acquisition of lands owned by Tenneco West, Inc. on and adjacent to the San Pedro in 1979.

Meetings held by FWS staff with private landowners and conservation groups to investigate possible acquisition of lands have occurred since the initial identification of the area as valuable wildlife habitat. Following the 1979 announcement by Tenneco West, Inc. of its unwillingness at that time to sell or lease its lands, our investigations were lessened in intensity but the FWS staff continued contact with Tenneco regarding our interest in preserving the San Pedro River and its multitude of wildlife values. During the ensuing years, meetings and correspondence with Tenneco continued although field inventory work was halted. In 1984, Tenneco opened discussions with the State of Arizona to negotiate possible divestiture of its San Pedro holdings. In response to a request from The Honorable Bruce Babbitt, Governor of Arizona, the FWS provided to the State our biological analysis and our recommendations concerning land deemed critical for protection of the San Pedro River's biotic community.

A coalition of major environmental organizations recently proposed, and were actively supporting, the appropriation of $10 million from the Land and Water

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Conservation Fund (LWCF) for the Service to initiate acquisition of the San Pedro area in FY 1986. When funding was not provided, alternative methods for acquiring the river and its habitats came under investigation. One such method, exchange of the Tenneco-owned tracts along the San Pedro River for BLM-administered lands elsewhere in Arizona, has been identified as the most cost effective alternative for initial protection of the San Pedro lands through transfer to Federal ownership.

The interagency working group comprised of representatives from The Nature Conservancy, Arizona Game and Fish Department, Arizona State Land Department, Bureau of Land Management, and FWS, has reviewed this exchange option together with other alternatives of acquisition and amounts and tracts of lands to be acquired. In response to the working group's request, the FWS again provided recommended boundaries for proposed protection. Other boundary proposals were received from private individuals and public agencies. All such proposals lie within the general study area previously described, and the majority are within the proposed refuge boundaries delineated by the FWS in 1978.

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IV. NATURAL RESOURCE VALUES

The San Pedro River rises in the Sierra Mariquita and Sierra de Los Ajos in northern Sonora, Mexico, and flows approximately 125 miles northward to its ultimate confluence with the Gila River near Winkelman, Arizona. The area under review for protection encompasses about 50 stream miles in the upper (southern) San Pedro River Basin. The major tributary within the area under consideration for protection is the Babocomari River, entering from the west in the northern half of the study area. The area is dissected by numerous ephemeral and intermittent streams and desert washes draining the adjacent mountains. The San Pedro is classified as a "live stream" within its course through the study area--it is characterized by year-round flow except during periods of extreme drought (Figures 4 and 5).

The habitat types supported by the river, its tributaries, and the surrounding uplands constitute a structurally diverse and ecologically stable community. The major vegetative cover types are discussed below:

Gallery forests of cottonwoods (Populus fremontii), and willows (Salix spp.) line large expanses of the main river channel (Figure 6). Extensive mesquite (Prosopis juliflora) bosques (Figures 7 and 8) and sacaton (Sporobolus wrightii) meadows occupy the majority of the river's remaining floodplain between the riparian forests and the uplands. Artesian springs in the San Pedro's floodplain near the town of St. David have created a cienega (wet meadow). Abandoned farming impoundments (1 acre or less in surface area) in this area that are fed by these springs support well developed marshes of cattail (Typha spp.) and rushes (Scirpus spp.).

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Figures 4 and 5. The riparian corridor along the San Pedro River, Cochise County, Arizona.

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Figure 6. Cottonwood--Willow forests bordering the San Pedro River, Cochise County, Arizona.

Figure 7. Mesquite stands within the riparian corridor of the San Pedro River, Cochise County, Arizona.

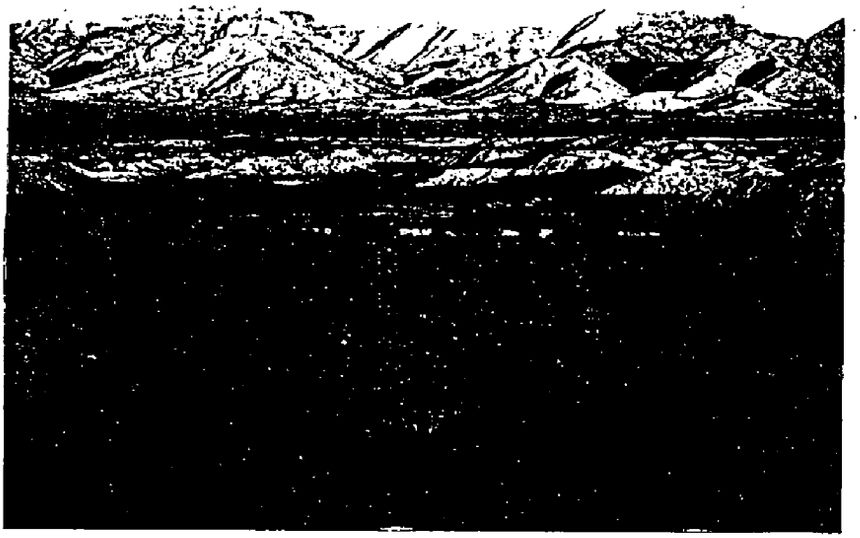

Figure 8. Mesquite bosque bordering the San Pedro River, Cochise County, Arizona.

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Outside the floodplain, adjacent lands support the Chihuahuan desert scrub community characterized by creosotebush (Larrea divaricata) and tarbush (Flourensia cernua) (Figure 9), and desert grasslands dominated by plains lovegrass (Eragrostis intermedia), mixed gramas (Bouteloua spp.) and three-awns (Aristida spp.). At the base of the Huachuca Mountains, on the western boundary of the study area, the desert grasslands yield to an oak woodland comprised of Emory (Quercus emouryi), Mexican blue (Q. oblongifolia), and Arizona white (Q. arizonica) oaks with a grass understory. These oak stands interdigitate with the grasslands in major washes cutting through the base of the mountains to the desert flats.

More detailed discussions of these plant communities may be found in Lowe (1964), Gavin (1973) and U.S.D.A. (1977).

The San Pedro system's complex mosaic of relatively undisturbed habitat types, its location in a transition zone between Chihuahuan desertscrub and grasslands, its permanent water in an arid region, and its proximity to the near-tropical river drainages of Mexico all combine to support a diverse faunal assemblage that is unique in the United States.

Based on a review of available data, the San Pedro area is utilized by more than 20 species of raptors. Twelve of these species nest along the San Pedro proper, its larger tributaries or in adjacent desert or cliff habitats (Glinski 1977). One such species is the gray hawk (Buteo nitidus)--approximately one-third of the total U.S. population (41 nesting sites) of this species occur along the San Pedro and comprise the only substantial nesting population of

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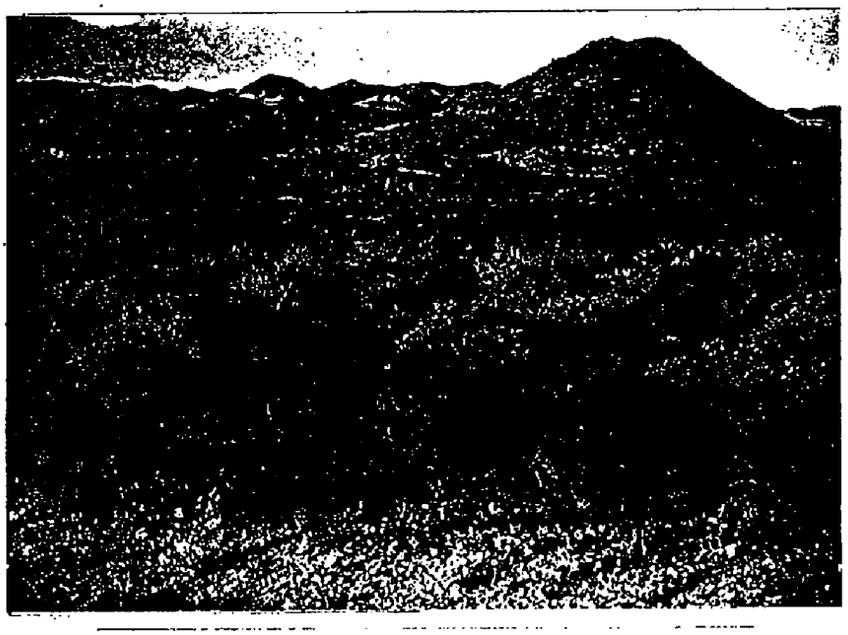

Figure 9. Chihuahuan desert scrub exterior to the floodplain of the San Pedro River, Cochise County, Arizona.

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these hawks in the United States. The majority of the remaining breeding raptors found on the San Pedro are principally, or entirely, dependent on riparian habitat for nesting sites.

Over 200 species of birds occur in the area; of that total 175 are breeding species (Phillips, Marshall, and Monson, 1964). The greatest numbers of birds are found in the riparian zone, attracted by the structural diversity of the vegetation. Mourning (Zenaida macroura) and white-winged (Z. asiatica) doves are among those species commonly found in the riparian habitat. Gambel's (Lophortyx gambelii) and scaled (Callipepla squamata) quails are also common in riparian cover types.

Mammalian species diversity in the adjacent Huachuca Mountains was investigated by Hoffmeister and Goodpaster (1954). Subsequent comparisons of the results of that study with other areas ranked the Huachucas second only to the montane cloud forests of Costa Rica in mammalian diversity.

Almost one-quarter of the fish species native to Arizona were first discovered and described from the San Pedro and its immediate tributaries (Ohmart 1982). However, of the 12 species of these natives known to have occurred historically in the river, only two--the desert sucker (Catostomus clarki) and the longfin dace (Agosia chrysogaster)--currently remain. Much of the ichthyofauna and other aquatic life in the river was decimated after the February, 1978, pollution of the San Pedro that was caused by the failure of an upstream copper mine tailings pond in Mexico. Recruitment from unaffected tributaries has replenished the fish fauna to some extent. The tailings pond has been repaired and,

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although future pollution cannot be ignored as a possibility, catastrophic spills such as that of 1978 are not anticipated. Given adequate protection and management, the San Pedro could serve as an excellent site for reintroduction and maintenance of a native fish fauna, including endemic endangered species such as the Gila topminnow (Poeciliopsis o. occidentalis), spikedace (Meda fulgida) and loach minnow (Tiaroga cobitus).

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V. CURRENT LAND USES AND OWNERSHIPS

The lands along the San Pedro are predominately privately-owned. The bulk of the lands immediately adjacent to the river are owned by Tenneco West, Inc. Large tracts of desert lands outside the floodplain are also controlled by Tenneco West, Inc., at both the northern and southern ends of the riparian corridor. State lands lie to the west of the river and adjoin the community of Sierra Vista and the military reservation of Fort Huachuca at the western edge of the study area. BLM administers tracts of public lands located to the east of the San Pedro's floodplain.

Grazing (Figure 10) is the primary use made of the lands, although agricultural lands, individual homesites, and small communities are interspersed with undeveloped lands along the length of the river.

Fort Huachuca and Sierra Vista are the major developments proximal to the areas proposed for protection. As the local business center, Sierra Vista provides services to the general area.

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Figure 10. Livestock grazing is a major land use of the San Pedro area, Cochise County, Arizona.

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VI. RESOURCE PROTECTION ALTERNATIVES

The FWS has under review several alternatives to obtain the optimal protection of the San Pedro River and its habitats. All of the options depend upon protecting the large contiguous tracts of riparian lands now owned by Tenneco West, Inc. This corridor would constitute the core of any protection plan. The preservation of this habitat could be achieved through a variety of methods: (1) exchange by BLM with subsequent withdrawal and administration by FWS as a unit of the National Wildlife Refuge System, (2) should the exchange program not be consummated, FWS purchase of the lands in fee title and administration as a National Wildlife Refuge, and (3) lease by the FWS from Tenneco West, Inc., and administration as a National Wildlife Refuge. Of these alternatives, the first is considered the most viable option: BLM and Tenneco West, Inc., are expected to complete preliminary negotiations for exchange by mid-December 1985. The FWS anticipates submitting its request for withdrawal of these lands immediately following the exchange.

In addition to the core riparian lands, several tracts have been identified as valuable wildlife habitat and integral elements of the San Pedro ecosystem. Some of these areas are also owned by Tenneco West, Inc., but it is unclear if they are to be included in any exchange proposal between the landowner and BLM. They are, however, considered by the FWS to be desirable additions to any protection efforts that may be undertaken in the San Pedro basin. These lands include the Tenneco-owned corridor from the river near Hereford to the Huachuca Mountains, the lower reaches of the Babocomari River, large tracts of upland habitat located outside of the floodplain, and inholdings surrounded by

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Tenneco-owned lands within the riparian corridor. Should any of these areas be included in the proposed exchange, they would perforce be included in any subsequent FWS withdrawal. If they do not become a part of the exchange program, they would be reviewed for alternative protection through purchase in fee title or lease by the FWS following the anticipated withdrawal from BLM management or independent FWS acquisition from Tenneco West, Inc., of the riparian corridor.

Because of its importance in any proposed protection plan for the area, the Tenneco-owned riparian corridor is discussed in more detail in the following section.

A. No Action

Should no action be taken by BLM or the FWS, there is a very great probability that the major landowner within the area of consideration, Tenneco West, Inc., will sell its holdings and valuable wildlife habitat will be destroyed in the next few years. The area is located in a region of Arizona that is becoming increasingly desirable for people seeking a temporary retreat in the "Sunbelt" during the winter and year-round homes for retirees. Tenneco West, Inc., has an ongoing land sales operation headquartered in Sierra Vista (Figure 11). In addition, the amount of land being cleared for farming or ranching activities is rapidly increasing.

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Figure 11. Tenneco West, Inc., has an ongoing sales operation for its San Pedro holdings.

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The San Pedro's flows are fed by discharge of groundwater moving toward the river from its sources of recharge along the mountain fronts that rim the basin. As the groundwater reserves are pumped to support increasing development in the area, the water table is lowered and discharge to the river is lessened. Such decreases in discharge can cause the river to go dry during periods of drought when groundwater would normally maintain some stream flow. Recent data (USDA 1977) indicate that in the Sierra Vista-Fort Huachuca area, the amount of groundwater withdrawal has been in excess of the amount of recharge and a cone of depression has occurred in the water table. This cone of depression is slowly expanding, following new commercial and residential development of Sierra Vista as that development moves eastward toward the San Pedro River. As development of this area increases, a greater degree of overdraft of the groundwater is expected to adversely affect the flows of the San Pedro River and the biotic communities they support.

Development of 40 acre "ranchettes," increasingly intensive agricultural development, and continued overdrafting of the ground water will undoubtedly occur without protection of this area. These uses will have a significant adverse impact on the wildlife of the San Pedro basin. Increased disturbance levels can cause nesting raptors to desert and ultimately abandon breeding territories. Removal of riparian vegetation will result in reduced carrying capacity for wildlife and less diversity of the wildlife community. Increased groundwater pumping will reduce the flows of the San Pedro River. General increased human occupation of the area will greatly lessen its value as a migration corridor.

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B. Acquisition or Management by Others

If BLM acquires the lands currently proposed (the riparian corridor only) development of adjacent and valuable wildlife habitats will occur, as described above. The management of the riparian corridor by BLM (should the exchange be completed but no action is taken by the FWS in withdrawing the lands for protection as a national wildlife refuge) would not provide the necessary protection for the ecosystem as a whole. In addition, the scope of BLM's management authority is at this time inadequate to fully protect any lands that may be acquired. Such authority requires special legislation. If granted by Congress, that authorization would mimic the existing authorities of the FWS.

Adequate protection of the San Pedro system by others such as the State of Arizona or private conservation groups would be limited by the capability of any of those entities to acquire sufficient lands to protect the San Pedro River and the surrounding habitats as a cohesive unit. The management of the area by the FWS rather than another entity is judged more beneficial to the wildlife species and their habitat based on several factors:

- The San Pedro River and its associated habitats are considered natural resources of national and international significance. The importance of these lands and waters fully merit their preservation as unit of the National Wildlife Refuge System, wherein protection of wildlife habitat would be the primary objective.

- As an international river, the San Pedro River shares both a biotic community and a watershed with Mexico. FWS administration of the San Pedro would

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be integrated within the FWS's existing excellent working relationship with its counterpart in the Mexican government. International treaties and conventions promulgated for the conservation of wildlife have been signed by the United States and Mexico. For the United States, the FWS is the administrating agency for those agreements.

- The ongoing Resource Contaminant Assessment Program of the FWS would provide a framework for water quality analysis, management, and recovery of the San Pedro River and its aquatic community.

C. Less-Than Fee Acquisition

Under this alternative, those privately owned lands not included in the BLM exchange and FWS withdrawal would be retained in private ownership, but simultaneouly managed for the protection of wildlife habitat. Protection agreements would be formulated between the FWS and willing landowners. Such protection could be achieved either through restrictions on landowners from conducting activities that would be detrimental to wildlife habitat or by active FWS management for habitat protection on those lands. Less-than-fee acquisition to achieve such protection could be accomplished through a variety of methods: lease, easement, deed restriction, management agreement, or similar devices where fee title remains with the landowner. The land would remain on the County tax rolls, and the owners would retain all ownership and land management options except those reserved by the FWS to preserve wildlife diversity and quality wildlife habitat. As previously stated, it is not anticipated that Tenneco West, Inc., would choose this alternative for either its lands under consideration for exchange with BLM or its outlying holdings. However, other

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private landowners might prefer the less-than-fee alternative and where appropriate, it will be utilized to the maximum extent possible.

D. Fee Acquisition

This alternative, as with the option of BLM exchange and FWS withdrawal, would provide permanent protection of wildlife habitat. Such an option could be implemented (on a willing seller basis only) on the Tenneco-owned lands if the exchange program is not consummated or on other privately-owned lands added to the river corridor if the exchange and subsequent FWS withdrawal is successfully completed. Under this alternative, mineral resources would be acquired by the United States to a depth of 500 feet below the ground surface. Below that depth, landowners would retain all mineral rights and could extract mineral resources from off-refuge sites through such methods as slant drilling or tunneling. Revenue Sharing funds (discussed later in this report) would be provided to the County to compensate for tax revenues lost through Federal acquisition.

E. Combination of Alternatives

Optimum protection of the diverse San Pedro ecosystem will undoubtedly depend upon an equally diverse array of alternative measures. Acquisition of the Tenneco-owned riparian corridor through BLM exchange and subsequent FWS withdrawal or direct FWS purchase in fee title if the exchange is not successful and offered by willing sellers would provide permanent protection for these lands and would establish the heart of the proposed refuge. Additional BLM-

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administered lands in the uplands to the east of the river and along the Babocomari River also could be included in the refuge through withdrawal by the FWS. Areas of privately-owned lands considered to represent key components of the San Pedro wildlife community would be reviewed for either less-than-fee or fee title acquisition. The preferred method of preserving the valuable wildlife habitat of the San Pedro River Basin will necessitate the use of all practical protection measures in the most efficient combination possible. Cooperative habitat preservation by concerned governmental and private entities will depend on an ecosystem approach to protecting not just one but all components of the river's ecosystem.

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VII. PROTECTION AUTHORITY

The land proposed for protection through anticipated withdrawal from BLM administration will be protected by the FWS through the authority contained in the Fish and Wildlife Act of 1956 (as amended), and the Endangered Species Act of 1973 (as amended). Funding authority for the project on privately-owned lands not included in the proposed exchange is provided by the Land and Water Conservation Fund Act of 1965 (as amended). The purchase price will be market value, as estimated by real estate appraisals.

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VIII. SOCIOECONOMICS

Federal acquisition of the area under consideration would displace some families now residing on the properties. It is assumed that those employed by Tenneco West, Inc., or the leasee of those lands would continue at other owned or leased properties. In the event their employment is not continued and they should become unemployed, their status would constitute an adverse impact upon the local economy. The administration of the area as a wildlife refuge should provide sufficient employment opportunities to offset any adverse local unemployment impacts resulting from FWS acquisition of the land. Loss of local income generated by sales and services to the existing tenants and owners would be offset by sales of goods and services necessary to maintain refuge administration.

Acquisition of the area as a national wildlife refuge would limit potential future economic development of the land by precluding residential, commercial, or agricultural development on refuge lands. However, the presence of a refuge would probably enhance the value of adjacent areas due to scenic preservation and potential attraction to visitors.

Federal land holdings are tax exempt, therefore, lands acquired by the FWS would be removed from the tax rolls in Cochise County. For those lands that are acquired in fee title, the county would receive an annual payment, in lieu of taxes, in accordance with the provisions of the Refuge Revenue Sharing Act (16 U.S.C. 715S: 49 STAT 383, as amended). This Act was designed to insure that the local government did not suffer a tax loss due to acquisition of lands

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for refuge purposes. For fee acquired lands, the Act provides a payment of 75 cents per acre, 3/4 of 1 percent of fair market value, or 25 percent of net receipts, whichever is greater. Lands acquired under easements would remain on the tax rolls and revenue sharing funds would not be applicable.

Should an exchange occur between BLM and any landowner and those lands subsequently be withdrawn by the FWS for establishment of a refuge, the county would receive payments based on 25 percent of net receipts. Public domain lands under primary jurisdiction of the FWS are also considered entitlement lands under the Payment in Lieu of Taxes Act administered by BLM. Under the Payments in Lieu of Taxes Act of 1976 (31 U.S.C. 1601-1607), BLM is authorized to pay the higher of: (a) 75 cents per acre, less the amount of certain Federal land payments that were received by the County in the preceding fiscal year, or (b) 10 cents per acre with no deductions made for other Federal payments. Both alternatives are subject to a ceiling which is linked to population within the County. The ceiling is formulated on a sliding scale to a maximum of $1,000,000. Based on the estimated population of Cochise County (56,066) the $1,000,000 ceiling would apply. Estimated payments on the 44,000 acres acquired through exchange by BLM would range from $4,400 to $33,000 per year under the Payments in Lieu of Taxes Act. Estimates of payments based on a 25 percent of net receipts obtained from the sale of products or privileges on the refuge are not available.

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IX. COORDINATION

The FWS has maintained consultation with concerned governmental agencies and private groups and individuals since this agency identified the San Pedro as valuable wildlife habitat in 1978. During the Unique Ecosystem's planning process and subsequent environmental assessment preparation, the following agencies and individuals were consulted:

Agencies	Private Individuals
Arizona Crop and Livestock Reporting Service, USDA	Carnes, Gayle
Arizona Game and Fish Department	Dykes, Judy
Arizona State highway Department	Elliott, Harold A.
Arizona State Parks Department	Giron, Janet M.
Arizona Widlife Federation	Glinski, Richard L. (Research Biologist, Arizona State University)
Huachuca Conservation Council	Keith, Susan
Huachuca Audubon Society	Labor, Virginia
Magma Copper Company	Martin, Paul S. (University of Arizona)
Maricopa Audubon Society	McMoran, Charles
Museum of Northern Arizona	Meeks, William A.
National Rifle Association	Rosenzweig, Michael L. (University of Arizona)
Raptor Research Foundation	Russell, Stephen (University of Arizona)
San Pedro Resource Conservation District	Spofford, Walter & Sally
Southwest Hawk Watch	Zimmerman, Jeffrey
State of Arizona Department of Economic Security	
The Nature Conservancy, Arizona Committee	
The Nature Conservancy, California Field Office	
The University of Arizona, Office of Arid Land Studies	
Trust for Public Land, Southwest Regional Office	
Tucson Audubon Society	
U.S. Bureau of Land Management	
U.S. Bureau of Recclamation	
U.S. Forest Service	
U.S. National Park Service	
U.S. Representative-Arizona, Honorable Morris K. Udall	

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Agencies	Private Individuals
U.S. Representative-Arizona, Honorable John J. Rhodes	
U.S. Senator-Arizona, Honorable Dennis DeConcini	
U.S. Senator-Arizona, Honorable Barry Goldwater	
U.S. Soil Conservation Service	

Other than Tenneco West, Inc., the major private landowner in the basin, the FWS has not contacted private citizens concerning their property in the area of the San Pedro River under consideration.

As a participant in the working group established by the State of Arizona, during the most recent negotiations with Tenneco West, Inc., the FWS has coordinated with other involved agencies. We have also consulted with the following entities during preparation of this report:

Defenders of Wildlife
Dr. Donald F. Hoffmeister
International Association of Fish and Wildlife Agencies
Izaak Walton League
National Audubon Society
National Wildlife Federation
The Wilderness Society

Consultation and coordination with concerned agencies and individuals will continue throughout the finalization of plans to protect the San Pedro River.

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X. PROPOSED MANAGEMENT

As a unit of the National Wildlife Refuge System, the proposed San Pedro River acquisition would be managed to achieve the following objectives:

a. Wildlife - to assure the protection and maintenance of all fish and wildlife resources and their habitat.

b. Research - to assure optimum opportunity for environmental and ecological research.

c. Interpretation - to expand man's understanding and appreciation of his total environment and his role in it.

d. Recreation - to provide a variety of ways people can enjoy wildlife and wildlands, within the framework of appropriate Federal and State laws.

Attainment of these objectives will be the result not only of active management on FWS lands, but of close coordination and cooperation with other landowners and administrators in the area. The two proposed State parks--one at the Santa Cruz de la Terrenate Spanish presidio site in the northern portion of the river corridor, and another at the Lehner Ranch mammoth-kill site at the southern edge of the area--would provide prehistoric and historic interpretive opportunities. Carrying such interpretation onto refuge lands through trails and an information center would link past and present uses of the area by man. The histories of the two Spanish Land Grants (San Juan de las Boquillas y Nogales and San Rafael del Valle) that constitute the major portion of lands proposed for refuge establishment, could be presented together with the history and importance of riparian habitats in the west. The San Pedro River would also serve as an excellent example of the arroyo cutting that occurred throughout the southwest in the late 19th century and determined the character of many southwestern rivers now flowing. Integration of these facets of the proposed

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refuge with the information to be made available at the planned State parks could produce a valuable regional resource for public use. In addition to coordination with State development, the refuge could also provide a link with existing natural preserves such as The Nature Conservancy's nearby Ramsey Canyon and Canelo Hill Cienega and the international Arizona-Sonora Desert Museum.

In order to develop a true understanding and appreciation of the complex workings of a riparian community, the public must be allowed use of that community. Such use can be managed at levels of intensity in designated areas and at times when the stability of the riparian habitat and its wildlife will not be adversely affected. The types of recreational activities that can be encouraged on refuge lands without compromising the value of those lands as wildlife habitat are also those activities which would promulgate public awareness and enjoyment of a rare resource. Such pursuits as hiking, photography, sightseeing, nature study, hunting, and other wildlife-oriented recreation can be regulated terms of timing, and location, in order to avoid adverse impacts to the resource and to remain compatible with the purpose of the refuge--preservation of a diverse wildlife habitat.

To protect the riparian zone, permanent public use facilities will be kept to a minimum in that zone. Trailheads, parking lots, and other areas of concentrated use will be sited outside the riparian community. An interpretive foot trail can extend throughout the length of the riparian corridor but will be maintained in discrete segments to facilitate closure of sensitive areas during

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critical periods. These closures may be imposed to protect active raptor breeding territories from disturbance, to allow habitat restoration, or to protect conflicting recreation user groups from possible mishap (e.g., bird watching during hunting seasons). Birding blinds and wildlife observation points will be incorporated into the trails at appropriate places.

The existing road on the west bank of the southern half of the river corridor will be retained to provide hunter and refuge operations access. Depending upon habitat conditions inventoried after refuge establishment, access to the river along this road may be modified. Existing areas of off-road-vehicle overuse will be subject to closure for habitat restoration.

A program of yearly censuses of raptor activity will be an integral element in managing public use of major areas of the proposed refuge. Game bird (quail and dove) surveys will also be conducted to assist in regulating hunting on the San Pedro in cooperation with the Arizona Game and Fish Department. Although on the ground surveys would be necessary to determine if huntable populations of javelina (Dicotyles tajacu) or mule deer (Odocoileus hemionus) exist within proposed refuge boundaries, these and other game species could also be hunted on the refuge in conjunction with State laws and regulations.

Reintroduction of native endemic fish species could provide opportunities for public education on the refuge as could increased use by such rare species as the coatimundi (Nasua nasua) as habitat quality improves following refuge establishment. The public is rarely granted an opportunity to view some of

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those species which contribute to the diverse biotic community of the southwest. The establishment of a refuge along this stretch of the San Pedro could provide such an opportunity.

The town of Sierra Vista, located five miles to the west of the proposed boundary, would continue to provide services to tourists and visitors as the attraction of regional recreation resources are enhanced by the establishment of a refuge. The exact location of refuge headquarters has not yet been proposed, however, it is envisioned that the headquarters complex would be comprised of a visitor center, offices, and shop, and would be staffed by approximately six fulltime employees.

As a refuge, the San Pedro would be made available for appropriate research efforts. The results of such efforts would greatly add to the existing body of scientific data concerning the dynamics of southwestern riverine and riparian communities. Inventories of both plants and animals are needed to update old findings and to assist in determining the status of numerous species of special interest.

Manipulation of the natural habitat through a variety of land use practices would be implemented if necessary to maintain or enhance wildlife values. Demonstration areas of such habitat manipulation methods would also provide valuable public education sites along the interpretive trail. The protection of this excellent quality riparian ecosystem would remain the dominant use of the refuge and would dictate the proposed management regime of the protected lands.

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XI. SUMMARY OF PROPOSED ACTION BY PROTECTION ALTERNATIVE

Resource Protection Alternative	Proposed Action
A. No Action No Action by BLM or FWS	Should no Federal acquisition take place and Tenneco West, Inc., sell its San Pedro River holdings, FWS will contact new landowner(s) concerning the need to protect wildlife resources on private land. Identify and contact other landowners concerning such protection. Utilize regulatory controls where applicable.
B. Acquisition or Management by Others	Continue cooperative preservation efforts. If BLM successfully concludes an exchange program, assist BLM in protecting wildlife habitat as dominant use of acquired lands. Assist conservation groups in acquiring and protecting private lands.
C. Less-Than-Fee Acquisition	Withdraw BLM acquired lands for establishment of a National Wildlife Refuge. Seek to develop conservation easements, lease agreements, management plans, and other methods of protection on private lands. Work with State agencies to inventory and protect resources on State lands.
D. Fee Acquisition	Acquire fee title from willing sellers on those areas where the FWS intends to make improvements or the owner is not willing to accept easement acquisition.

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SAN PEDRO RIVER RIPARIAN MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT

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U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

SAFFORD DISTRICT

SAFFORD ARIZONA

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JUNE, 1988

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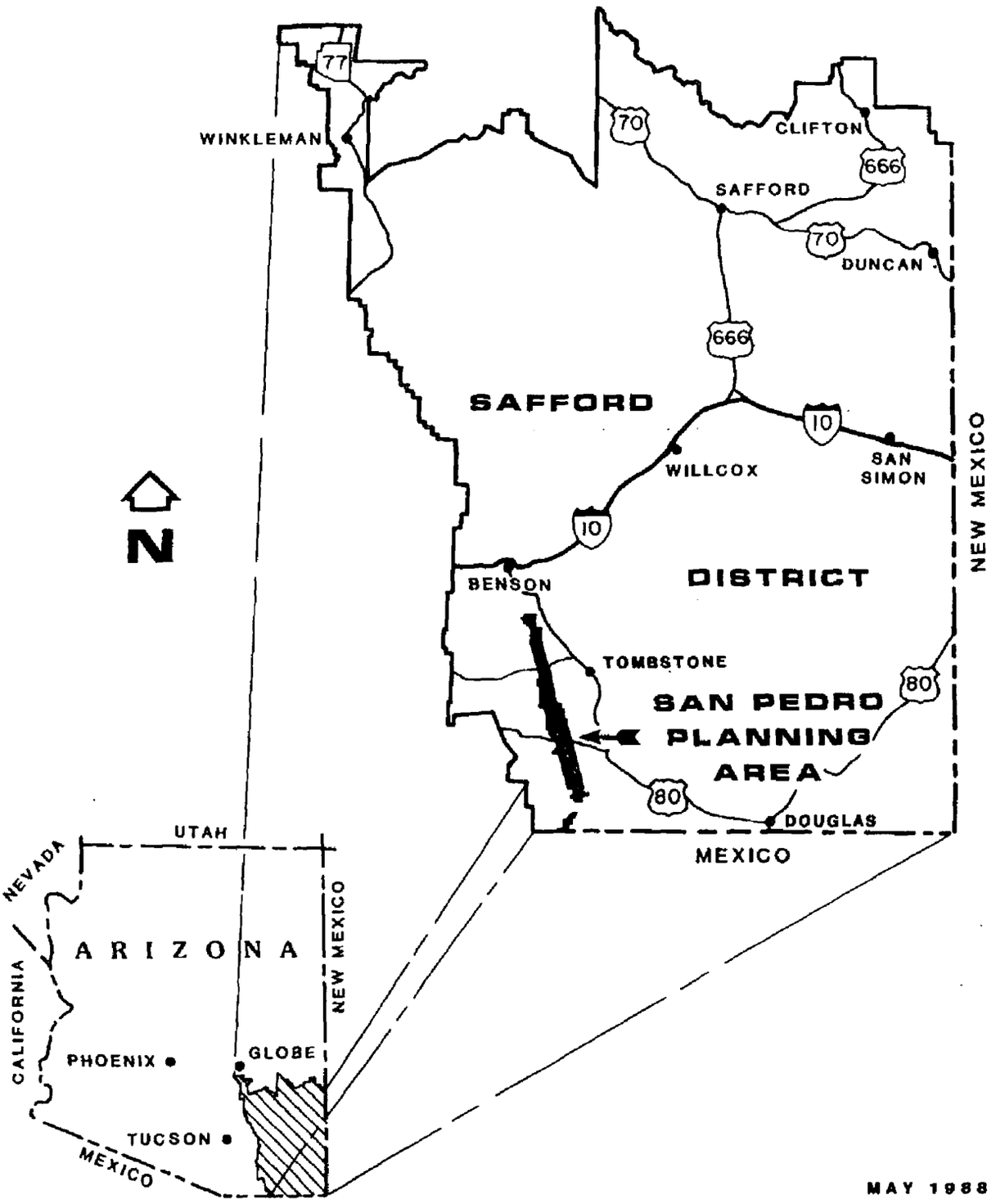
SAN PEDRO RIPARIAN PLANNING AREA
LOCATION MAP



MAY 1988

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DRAFT

SAN PEDRO RIVER RIPARIAN MANAGEMENT PLAN
and
ENVIRONMENTAL IMPACT STATEMENT

for the

SAN PEDRO RIVER EIS AREA
Cochise County, Arizona

Prepared by

THE DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SAFFORD DISTRICT

STATE DIRECTOR
ARIZONA STATE OFFICE

This draft environmental impact statement (EIS) considers the anticipated consequences of implementing four alternatives, including a No Action Alternative, for the protection and enhancement of public land and the riparian ecosystem along the upper San Pedro River in Cochise County, Arizona. Other alternatives considered include a Utilization Alternative, a Preservation Alternative and a Preferred Alternative.

For further information contact: Jerrold Coolidge, EIS Team Leader, Safford District Office, Bureau of Land Management, 425 E. 4th St., Safford, Arizona 85546, or call (602) 428-4040.

Comments on the Draft EIS are due September 21, 1988.

Draft

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SUMMARY

PURPOSE AND NEED

The San Pedro River Riparian Management Plan and Environmental Impact Statement (EIS) involves lands located along the San Pedro River in western Cochise County, Arizona. These lands, acquired through private and state exchanges in 1986, total 47,668 acres.

The purpose of the proposed action and its alternatives is to define a plan to protect and enhance the riparian ecosystem and the area's historic and prehistoric values. Because of the sensitive nature of the riparian ecosystem, BLM will stress certain traditional multiple use activities and prohibit others.

Throughout the planning process and EIS preparation BLM asked for information and concerns from individuals, groups and land management agencies.

Public participation included public meetings in Benson, Bisbee, Sierra Vista, Tucson and Phoenix in January, 1986.

In this draft EIS BLM considers four alternatives to resolve the issues identified through the public meetings. These are: A) No Action, B) Preservation, C) Utilization and D) Balanced. Based on resource benefits and public comments BLM selected Alternative D as the preferred alternative. In this document the Balanced alternative is referred to as the Preferred alternative.

After reviewing the final EIS BLM managers will select the management plan for implementation on the San Pedro River Riparian Management Area. This management plan may be the Preferred alternative or it may be one that incorporates parts of all the alternatives.

ALTERNATIVES AND CONSEQUENCES

Alternative A: No Action

Implementation

This alternative will reduce human activity to a minimal level. Only those actions required to protect the property and its resources will be permitted. The No Action alternative will prohibit public access and limit projects to those essential to protect Threatened and Endangered Species.

Consequences

Implementation of this alternative will cause adverse impacts to the economic component through loss of economic returns from recreation and sand and gravel extraction. Social impacts will occur because people would not be able to recreate on the lands.

Benefits would accrue to the water, vegetation, cultural, wildlife, soil and air resources because of the lack of disturbances.

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Alternative B: Preservation

Implementation

Under this alternative limited public recreation use can take place. Actions will enhance wildlife habitat, water and vegetation. This alternative will also provide protection to cultural and paleontological resources.

Consequences

Wildlife habitat, water, vegetation and soils will benefit through implementation but to a slightly lesser degree than under the No Action alternative. Dispersed recreation will provide a positive effect on the social component.

Alternative C: Utilization

Implementation

This alternative emphasizes the use of the land by the public. Enhanced recreational opportunities will be available. The use will not significantly impact the natural resources.

Consequences

There will be adverse impacts to water quality, wildlife, vegetation, soils and cultural/paleontological resources. This alternative will have the positive economic and social benefits.

Alternative D: Preferred

Implementation

This alternative will permit significant developed and undeveloped recreational use. The preferred alternative emphasizes actions to protect or enhance vegetation, wildlife, habitat, water and cultural/paleontological resources.

Consequences

Minor adverse impacts to the major resources will occur from increased levels of activity. Seedings, natural revegetation, and prescribed fires will benefit the vegetation resource. Wildlife habitat improvement projects will benefit a number of resource values.

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CHAPTER 1

CHAPTER 1
PURPOSE AND NEED

INTRODUCTION

The environmental statement considers the anticipated consequences of implementing four alternatives for the protection and enhancement of public land and the riparian ecosystem along the upper San Pedro River in Cochise County, Arizona. These lands, were recently obtained through private and state exchange. BLM administers these lands out of the San Simon Resource Area, Safford District. This study addresses 47,668 acres of land (see Map 1) in a strip about 36 miles long and 2.6 miles wide. Safford District has no land use plan for the Cochise Planning Unit, the location of these lands.

PURPOSE AND NEED

The purpose of the proposed action and its alternatives is to define a land use plan that will protect and enhance the riparian ecosystem. The plan will also be consistent with the multiple use mission of BLM.

Because of the sensitive nature of the riparian ecosystem BLM will stress certain traditional multiple-use activities and prohibit others.

Setting

The San Pedro River Management Plan/EIS area is in the southwestern part of the San Simon Resource Area in Cochise County. BLM obtained most of these lands through a private exchange concluded on March 6, 1986. The lands were historically referred to as the San Juan de las Boquillas y Nogales and the San Rafael de Valle land grants. The former owners allowed some limited uses to occur on these lands in the past. At the time of acquisition one rancher grazed livestock on the land and two sand and gravel operations were active. The terms of the exchange allowed these uses to continue at least until the end of the lease periods. Many rights-of-way for roads and utilities cross the lands. Since the 1986 acquisitions BLM has added more lands through private and state exchanges so the EIS area now extends to the Mexican border. These lands are under study by Congress for designation as a National Conservation Area. This EIS only evaluates the lands in the original exchanges plus the lands south of Palominas. The Safford District Resource Management Plan, now under development, will address the adjacent public lands.

The upper San Pedro River is the focal point of the EIS area. Arising in northern Mexico, it flows northward to its confluence with the Gila River near Winkelman, Arizona. The river is perennial from Charleston to near Hereford and supports a riparian ecosystem in good condition with high wildlife species diversity.

Scoping

Scoping meetings were held in Tucson, Phoenix and Sierra Vista in January 1986. From these scoping meetings and subsequent meetings with individuals, organizations and state agencies a number of specific concerns were identified. The EIS team organized and combined these into seven issues. Five of these, discussed below, are addressed in this EIS. Two other issues (wilderness and livestock grazing) are not addressed.

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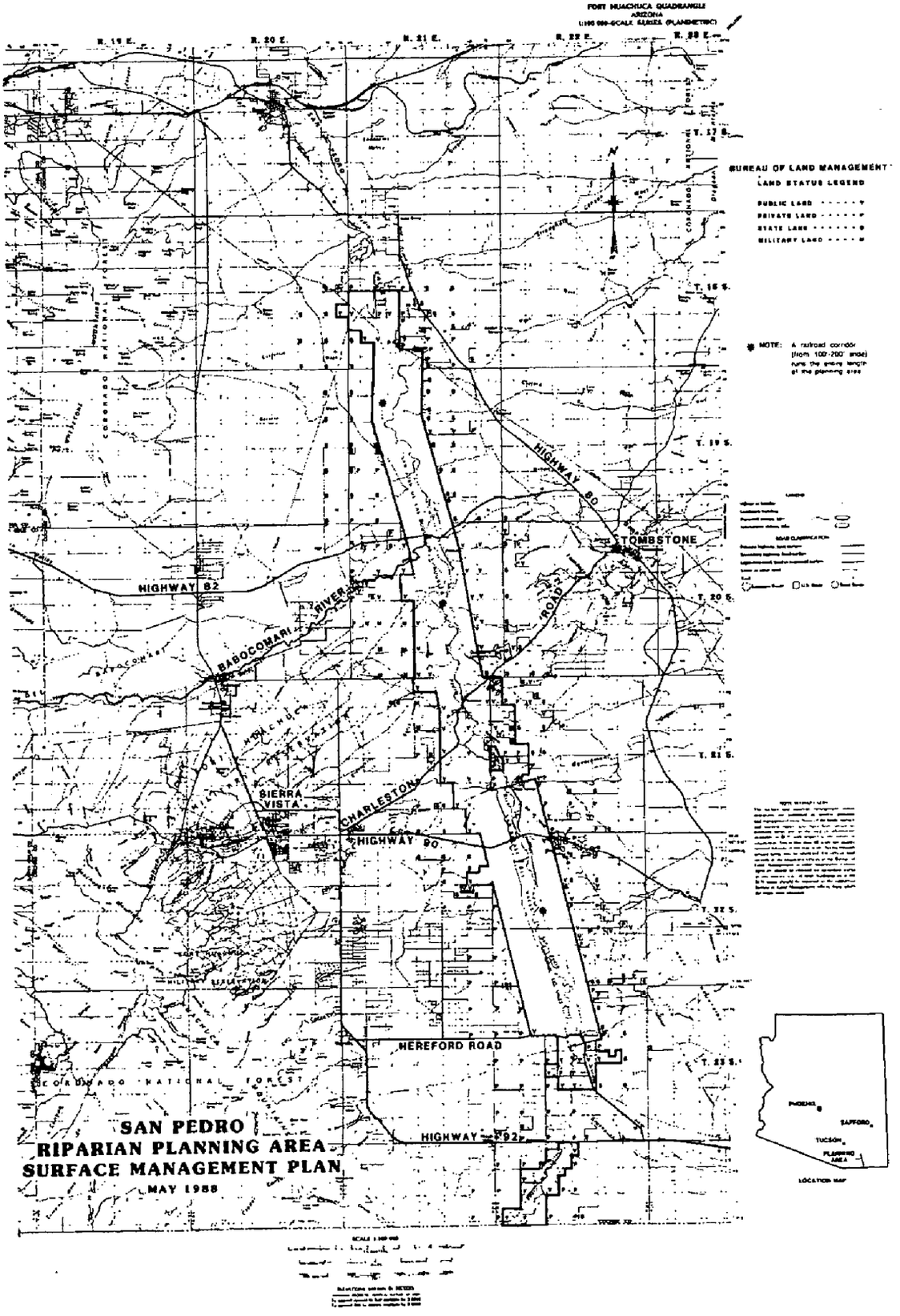

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ISSUES ADDRESSED

Issue 1 - Wildlife Habitat

The San Pedro River is an outstanding example of desert rivers in the Southwest. Many species of wildlife depend on the vegetation found here and any degradation or loss would have serious consequences.

Various forces, human-caused and natural, affect the continued existence of this resource. One example of this is the loss of mature plants and their reproductive potential from the loss of water supply, streambank erosion and vegetation removal. Natural forces affecting the riparian ecosystem could include climatic changes, fires and earthquakes. Human-caused activities include mineral operations near the river, livestock grazing, firewood cutting, inappropriate vehicle use and excessive water pumping.

Issue: How can BLM manage these lands to protect and enhance the wildlife habitat, especially the riparian ecosystem?

Issue 2 - Sand and Gravel Operations

Presently, sand and gravel is extracted at one location near the river. This will continue until the lease period expires. Continuation of this use is at issue here.

Issue: Should BLM permit sand and gravel operations if they don't cause damage or loss of riparian vegetation, water quality degradation, and visual intrusions?

Issue 3 - Recreation Use and Development

The public has high expectations for recreational uses. These range from very limited, primitive types of uses to extensive use and development. The effects of these various levels of use and kinds of use on water quality, riparian vegetation, wildlife species, cultural and paleontological resources and soils needs examining.

Issue: What types and levels of recreation use should BLM permit while still protecting the other resource values?

Issue 4 - Protection of Cultural and Paleontological Resources

Many historic, prehistoric and paleontological sites are on these lands, some with great significance. BLM is required, by law, to protect these sites in its management of the San Pedro lands.

Issue: How can BLM protect these resources and at the same time provide opportunities for public education and appreciation and for scientific research.

Issue 5 - Water Quality and Quantity

Water quality and quantity are important concerns, and have high significance. Much of the watershed is in Mexico where a high potential for use of the water exists. Also, a growing population in Sierra Vista represents an increasing demand for ground water.

Existing water rights, future Bureau activities, increasing water demands in the San Pedro River basin, and the protection and maintenance of the riparian ecosystem produce conflicts for maintaining the existing quantity and quality of water.

Issue: How can BLM retain adequate water to protect the riparian ecosystem and provide for other

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resource needs? Also, how can BLM maintain the riparian ecosystem and minimize the impacts on other water users?

ISSUES CONSIDERED BUT NOT ANALYZED

1. Wilderness - The potential for wilderness in the EIS area was considered but not included. An inventory applied the size criterion (greater than 5,000 roadless acres) and found two eligible regions. One (the Boquillas unit) is in the west central portion of the EIS area and the other is in the southwestern portion of the EIS area (the West del Valle unit).

   The Boquillas unit did not meet the naturalness criterion. The unit contains boundary and interior roads and ways, railroad tracks, powerlines, old railroad grades and bridge abutments, ruins of a farming settlement and its fields, ruins of the town of Charleston, and livestock facilities. The Boquillas unit also lacks outstanding opportunities for solitude and primitive recreation because of: boundary roads and vehicles on them, an extensive network of interior roads and ways, the railroad line, and the other evidence of human activities.

   The West del Valle unit is mostly natural in appearance, has few visible human impacts, and meets the criteria for naturalness. The unit lacks outstanding opportunities for solitude and primitive recreation because of: boundary roads and vehicles on them, the long and thin alignment of the unit, the lack of topographic relief, and the lack of vegetative screening.

   Since these two units fail to meet some of the requirements for wilderness, they are not carried forward and are not an issue in this DEIS.

2. Livestock Grazing - The primary purpose for obtaining the lands in the EIS area was to protect and enhance the riparian ecosystem along the upper San Pedro River. While BLM does not regard livestock grazing to be incompatible with the continued existence of the riparian ecosystem, a decision was made to prohibit livestock grazing for the 15-year life of this plan. At the end of that time livestock grazing in the EIS area will be re-evaluated.

ALTERNATIVE FORMULATION CRITERIA

The criteria for alternative formulation are:

- All alternatives will provide for protection and enhancement of the riparian ecosystem.
- All alternatives will provide for protection of the habitat of threatened and endangered species as required by the Endangered Species Act.
- All alternatives will provide for protection of significant cultural resources as required by the National Historic Preservation Act and the Archaeological Resources Protection Act.
- All alternatives will assume a continuation of existing interagency cooperative agreements.
- At least one alternative will provide for some developed recreational uses.

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- All alternatives will be reasonable and attainable.

- At least one alternative will comply with the No Action stipulation of the Council on Environmental Quality regulations (40 CFR 1502.14(d)).

ALTERNATIVE EVALUATION CRITERIA

Criteria used to evaluate the alternatives are:

- significant social and economic impacts

- consistency with federal, state and local plans

- significant impacts to resource values, such as:

  wildlife habitat condition, especially in the riparian area;
  watershed/water quality and quantity;
  recreation opportunities
  historic and prehistoric sites;

- compatibility with adjoining land uses, and

- implementation requirements.

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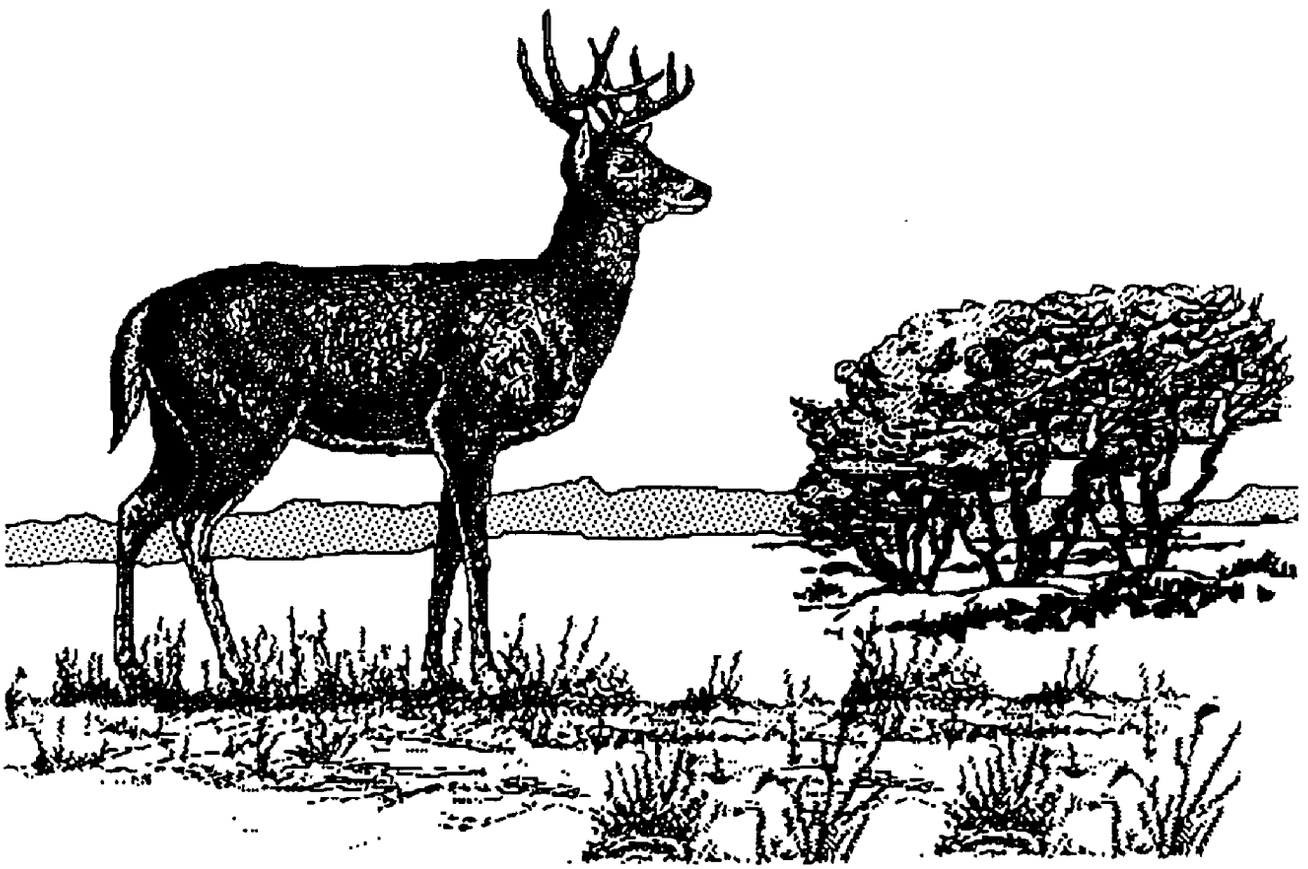
CHAPTER 2



CHAPTER 2

THE ALTERNATIVES

INTRODUCTION

Chapter II describes in detail four alternatives, including the Preferred Alternative and the No Action. These alternatives were developed to resolve the issues discussed in Chapter 1. This chapter identifies the various combinations of public land uses and resource management practices that respond to the five major planning issues. All alternatives are assessed in relation to long-term impacts, except where noted as short-term. The short-term period is defined as up to five years following filing of the final EIS and plan. The alternatives are: Preservation, Utilization, Preferred and No Action. Table 2-1 summarizes the management actions proposed in each alternative.

MANAGEMENT PRACTICES COMMON TO ALL ALTERNATIVES

The principal concern of management is to protect and enhance the riparian ecosystem along the San Pedro River. Acquisition of the lands was and is primarily for their riparian or water-related values.

General

- Continue inventories and studies as necessary to meet objectives determined in this document.
- Follow monitoring plans developed as a part of this document. (See Appendix 10).
- Follow with all applicable laws, regulations and policies.
- Fence property boundaries to establish visual identification of the land ownership and reduce the probability of unauthorized use.
- Prepare environmental assessments, to assess impacts of site-specific projects.
- Maintain improvements on the property that are needed for the administration of the area.

Recreation

- Establish firearms restrictions around developed facilities and at other specific locations. Coordinate with the Arizona Game and Fish Commission and the Arizona Game and Fish Department on these designations and their enforcement.
- Prohibit off-road use by any type of vehicle. BLM will either retain existing roads in the area for public and/or administrative use or close and rehabilitate them. The number of roads available for public use varies with the alternatives. The most roads are open to use under the Utilization Alternative, limited amounts under the Preferred Alternative, and none under the No Action and Preservation Alternatives.

Lands

- Maintain and use existing rights-of-way, subject to stipulations that will protect resource values.
- Obtain additional lands within the San Pedro boundaries by mutual agreement via exchange or purchase to block up the land

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ownership pattern or for riparian values. Lands may also be obtained outside the boundaries for the protection and enhancement of the resource values found inside the EIS area.

- o Establish protective withdrawals for administrative and interpretive facilities as necessary for management of the EIS area.

Water

- o In accordance with state and federal standards implemented resource management actions will maintain water quality.

- o Plan activities to maintain existing surface and groundwater conditions. BLM will continuously monitor river flow and fluctuations of the groundwater table to determine if changes occur in the floodplain and regional aquifers. Water quality monitoring will be an ongoing process.

- o Follow all available legal avenues to protect rights to surface and groundwater. This includes the protection of the Bureau's pending application for instream flow rights, those rights of the St. David Irrigation Company for the San Pedro River, and groundwater rights under a potential active management area designation.

Wildlife Habitat

- o Manage terrestrial wildlife habitat to provide the best habitat for existing population levels of wildlife.

- o Assess impacts to federally listed Threatened and Endangered species and state-listed species. Bureau inventories have not identified any federally listed species in the San Pedro EIS area to date. BLM will not authorize actions that jeopardize potential populations or their habitat.

- o Consider special status species (i.e., state listed species and candidate species listed in the Federal Register) on a case-by-case basis. Although candidate species have no legal protection under the Endangered Species Act, it is BLM's policy to manage their habitat at levels high enough to keep them from becoming federally listed.

- o Establish mitigation procedures to reduce impacts to wildlife and wildlife habitat.

Vegetation

- o Prohibit firewood cutting within the San Pedro EIS area.

Minerals

- o Withdraw the San Pedro property from mineral entry and mineral leasing laws.

Cultural

- o Preserve or enhance cultural resource values through management actions and the control of land uses. Management actions include patrol, stabilization of ruins, and control of access.

Paleontological

- o Manage all paleontological sites to preserve their scientific values and potential public use values.

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NO ACTION ALTERNATIVE

Theme Statement

The theme of the No Action Alternative is to protect and/or improve the resources of the San Pedro EIS area by reducing human activity to a minimal level. This will protect cultural and paleontological resources from actions that may adversely affect them. It will also improve the wildlife, vegetation and water resources by allowing natural processes to occur without intervention.

Recreation

Objective: Provide only minimal informational facilities.

Planned Actions:

- o Close the entire San Pedro to all forms of public recreation use.
- o Install signs for informational and interpretive use in the Fairbank, Charleston, Highway 90 bridge, Hereford and Palominas areas.

Lands

Objective: Provide for the use of only those lands necessary for existing rights-of-way.

Planned Actions:

- o Allow maintenance on existing rights-of-way, subject to stipulations that will protect resource values.
- o Do not permit any new rights-of-way.

Water

Objective: Conserve the groundwater resource.

Planned Actions:

- o Permanently shut down, cap and abandon all irrigation and domestic wells. Remove pumping and distribution equipment and restore the impacted areas.

Wildlife

Objective: Provide for the reintroduction of federally listed native Threatened and Endangered species.

Planned Actions:

- o Develop habitat improvement projects as agreed upon through the consultation requirements of the Endangered Species Act.

Objective: Determine the condition and status of wildlife and their habitat.

Planned Actions:

- o Inventory terrestrial and aquatic habitats.
- o Inventory terrestrial and aquatic vertebrates along with their associated food supplies.
- o Monitor changes in terrestrial and aquatic habitats.

Vegetation

Objective: Allow only natural processes to affect vegetation.

Planned Actions:

- o Leave abandoned farmfields unplanted.
- o Plant no trees for wildlife habitat improvement purposes.
- o Do not use prescribed fire to maintain existing vegetation communities or to reduce hazards due to fuels build-up.

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Soils/Watershed

There are no objectives or planned actions for soils/watershed under this alternative.

Fire

Objective: Control wildfires threatening natural resources and structures and reduce the acreage burned.

Planned Actions:

- Suppress wildfires on a high priority basis. All wildfires on or threatening to burn onto the San Pedro EIS area will receive full and sustained suppression action.

Cultural

Objective: Preserve significant sites to maintain their present condition.

Planned Actions:

- Conduct occasional patrols to monitor site condition and identify potential threats to the resource.
- Complete protection measures to preserve scientific and sociocultural values at significant sites, such as stabilization, fencing and data recovery.

Paleontological

Objective: Preserve the scientific values of paleontological resources.

Planned Actions:

- Inventory any future land acquisitions for paleontological resources.
- Check known sites periodically (every 3-5 years) and collect exposed fossils.
- Check high potential areas periodically.
- Allow excavation and collection at the Dyak site, Horsethief Draw Mammoth site, and Horsethief No. 2 site.
- Allow new paleontological research.
- Protect significant paleontological resources by controlling other resource and land uses through avoidance, mitigation and other measures.
- Collect significant fossils threatened by natural and human disturbance.

Minerals

Objective: Do not permit mineral activities in the San Pedro EIS area.

Planned Actions:

- Allow no new development on any of the subject lands.
- Do not renew any current contracts.

Visual

Objective: Maintain the San Pedro EIS area's existing visual character.

Planned Actions:

- Under this alternative no visual resource management classifications (see Appendix 4) are made. All 47,668 acres remain unclassified. The entire EIS area will be managed as a VRM Class III area, the standard BLM practice for unclassified areas.

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Areas of Critical Environmental Concern (ACECs)

- There are no objectives for ACECs under this alternative. No ACECs or RNAs are designated under this alternative.

Administrative Facilities

Objective: Provide for minimal administrative facilities.

Planned Actions:

- Continue using the existing small facility at Fairbank.
- Use the housing at Boquillas Ranch, Fairbank, Hereford and Palominas for employees or for use by cooperating agencies.

PRESERVATION ALTERNATIVE

Theme Statement

The theme of the Preservation Alternative is to protect and enhance, to the maximum extent possible, the resources of the San Pedro EIS area. Management actions focus on: enhancing wildlife habitat, water quality and quantity, and vegetation; protecting cultural and paleontological resources; and permitting limited public use.

Recreation

Objective: Provide for limited recreational use of the EIS area with minimal facilities.

Planned Actions:

- Designate the entire San Pedro as a special recreation management area.
- Prepare project plans for the proposed facilities.
- Apply the Limits of Acceptable Change (LAC) planning system.
- Make the San Pedro available for recreation research.
- Close all roads to public use but allow continued BLM administrative use of roads. Designation the entire EIS area as "Closed" to ORV use.
- Close the entire San Pedro EIS area to the discharge of firearms.
- Allow only day use of the EIS area. Limit recreation use to primitive and non-impairing forms. No campfires allowed.
- Install signs (informational, directional, interpretative) and build parking areas at Fairbank, Charleston, Highway 90, Hereford and Palominas.
- Provide two dedicated, undeveloped outdoor environmental educational field study areas.

Lands

Objective: Provide for limited future rights-of-way across the EIS area.

Planned Actions:

- Establish rights-of-way corridors at the Charleston and Hereford.
- Confine all new rights-of-way to these corridors.
- Allow maintenance on existing rights-of-way, subject to protection of resource values.

Water

Objective: Allow for limited consumptive use of the groundwater resource.

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Planned Actions:

- Except for those irrigation wells needed to provide water for wildlife habitat improvements, close and cap all other irrigation wells. Occassionally pump the capped wells in order to insure protection of groundwater rights based on prior use. This would occur only if the upper San Pedro watershed is designated as an Active Management Area.

- Continue to pump a small number of non-irrigation wells to support resource needs and administrative activities in the San Pedro EIS area.

Wildlife

Objective: Determine the condition and status of wildlife and their habitat.

Planned Actions:

- Inventory terrestrial and aquatic vertebrate along with their associated food supplies.

- Monitor changes in terrestrial and aquatic habitats.

- Mitigate potential impacts to terrestrial and aquatic habitats to assure existing habitat diversity through time.

- Identify special management guidance to protect areas important for raptors and herons.

- Prepare a habitat management plan (HMP) for the EIS area.

Objective: Emphasize the nonconsumptive use of fish and wildlife.

Planned Actions:

- Do not allow trapping in the San Pedro EIS area.

- Minimize human disturbance around important wildlife areas.

- Allow wildlife species collections only for administrative purposes. Coordinate these collections with the AGFD.

- Analyze the potential for wildlife related research in the EIS area.

- Establish interpretive and environmental education programs on wildlife and their habitat, with emphasis on the riparian ecosystem.

Objective: Provide for the reintroduction of native wildlife species, including Threatened and Endangered species. Use habitat improvements to maximize habitat availability.

Planned Actions:

- Plant abandoned farm fields (1,500 to 2,000 acres) with preferred forage species.

- Use prescribed fires to improve terrestrial habitat.

- Develop ponds and marshes for aquatic and terrestrial wildlife.

- Plant native trees (seedlings or poles) along the riparian corridor and other areas where desirable to enhance wildlife habitat.

- Use short-term pumping of irrigation wells to support aquatic habitat improvements.

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- Develop plans for removal of exotic fish from existing ponds in cooperation with AGFD.

Vegetation

Objective: Maintain and enhance the vegetation communities of the San Pedro EIS area.

Planned Actions:

- Replant abandoned farm fields to native grasses, forbs and/or shrubs. Use some non-native species now found in the area and considered beneficial .
- Replant areas outside the farm fields, where needed. Select a mix of native species to balance watershed protection and wildlife habitat needs.
- Establish, if desirable, a native tree nursery.
- Use prescribed fire to maintain the natural vegetation mosaic.

Soils/Watershed

Objective: Maintain and enhance the soils/watershed resources of the EIS area to reduce future soils erosion.

Planned Actions:

- Build low, main channel detention structure at the site of the St. David Canal diversion to regrade the eroded channel and for water diversion by the canal company.
- Build, as needed, additional erosion control structures along either the main or side channels. This can include small structures that might be needed to protect other resources, such as eroding cultural sites.
- Remove the dikes or berms on both the east and west sides of the farm fields. Return the land as near as possible to its natural (preclearing) contour.

Fire

Objective: Control wildfires threatening natural resources and structures and reduce the acreage burned.

Planned Actions:

- Suppress wildfires on a high priority basis. All wildfires on or threatening to burn into the San Pedro EIS area will receive full sustained suppression action.

Cultural

Objective: Preserve cultural resources.

Planned Actions:

- Prepare a Cultural Resource Management Plan (CRMP) for the EIS area.
- Allocate all sites to one or more of the following use categories: Scientific Use, Management Use, Public Use, Sociocultural Use, and Conservation for Future Use (see Appendix 2 for definitions of these categories).
- Nominate eligible properties to the National Register of Historic Places.
- Manage sites to realize their allocated use while protecting the site's other cultural resource values from impact.
- Complete a Class III intensive field inventory of the entire management area and record all cultural resources.

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- o Maximize the efficiency and quality of site management through the development of cooperative management agreements and the use of volunteers.

Objective: Manage a majority of sites for their Information Potential (see Appendix 1).

Planned Actions:

- o Allow scientific study to gain knowledge on the full array of the cultural resources in the EIS area, to fulfill regional research objectives, and to fill regional data gaps (Bronitsky and Merritt, 1986).

- o Identify scientific research objectives by historic context for the EIS area.

- o Allocate the following sites to Scientific Use (see Appendix 2): AZ EE:8:1 (ASM), AZ EE:8:5 (ASM), AZ EE:8:7 (ASM), AZ EE:8:4 (AMF), Benson 8:3 (GP), SPII-10, SPII-16, SPII-20, AZ EE:4:3 (ASM), AZ EE:8:48 (ASM), and AZ EE:8:34 (ASM).

- o Manage sites eligible for Scientific Use allocation to preserve scientific values and other cultural resource values.

Objective: Manage no sites for Public Values (see Appendix 1).

Planned Actions:

- o Identify socio-cultural values. Give full consideration to these values in the management of associated sites and areas.

Objective: Manage a small number of sites for Conservation (see Appendix 1) to protect and preserve representative samples of all the cultural resources in the EIS area.

Planned Actions:

- o Protect sites potentially eligible for allocation to Conservation for Future Use (see Appendix 2) to preserve their scientific and public values.

- o Allocate a representative sample of sites in each historic context to Conservation for Future Use.

- o Do not permit conflicting land and resource uses on allocated sites.

- o Release sites from Conservation for Future Use only if they meet the required conditions (see Appendix 3 for the conditions).

Paleontological

Objective: Preserve and enhance the scientific and potential public use values of paleontological resources to increase the knowledge of the San Pedro EIS area's natural history.

Planned Actions:

- o Inventory any future land acquisitions for paleontological resources.

- o Check known sites periodically (every 3-5 years) and collect exposes fossils.

- o Check high potential areas periodically.

- o Promote and fund the excavation and collection at the following sites: Dyack, Horsethief Draw Mammoth and Horsethief No. 2.

- o Promote and fund new paleontological research.

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- o Protect significant paleontological resources by controlling other resource and land uses through avoidance, mitigation and other measures.

- o Collect significant fossils threatened by natural and human disturbances.

Minerals

Objective: Do not allow mineral activities in the San Pedro area.

Planned Actions:

- o Allow no new development on any of the subject land.

- o Do not renew any current contracts.

Visual

Objective: Manage the San Pedro EIS area's visual resources to preserve the outstanding scenery and enhance areas impacted by human disturbance.

Planned Actions:

- o Designate the visual resources of the subject lands into the following Visual Resource Management classes (see Appendix 4):

  Class I: 2,060 acres
  Class II: 11,144 acres
  Class III: 8,914 acres
  Class IV: 25,550 acres

  Preservation oriented management will occur in the Class I areas (the proposed RNAs) and Class II areas (most of the scenic valley bottom along the San Pedro River). Enhancement actions will take place in those areas previously impacted by human disturbance.

Areas of Critical Environmental Concern (ACEC)

Objective: Preserve and enhance the identified special values of the San Pedro EIS area.

Planned Actions:

- o Designate the entire San Pedro EIS area as the San Pedro Riparian ACEC. Accomplish management of this ACEC by applying the management direction for the Preservation Alternative.

- o Designate three research natural areas (RNA) within the ACEC -- St. David Cienega, 350 acres; San Pedro River, 1,340 acres; and San Rafael, 370 acres. In addition to area-wide constraints of the Preservation Alternative, permit no developments and new rights-of-way in the RNAs.

Administrative Facilities

Objective: Provide for administrative facilities.

Planned Actions:

- o Expand the existing facilities at Fairbank to handle the identified needs.

- o Use the housing at Boquillas Ranch, Fairbank, Hereford and Palominas for employees or for use by cooperating agencies.

Research

Objective: Provide minimal facilities for a variety of research in the EIS area.

Planned Actions:

- o Develop a small facility at Fairbank for research in such

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fields as biology, hydrology, archaeology, paleontology, soils and botany.

UTILIZATION ALTERNATIVE

Theme Statement

The theme of the Utilization Alternative is to emphasize the availability of the San Pedro EIS area for public use while still protecting the wildlife, cultural, paleontological, vegetation and water resources.

Recreation

Objective: Provide for extensive recreation use of the EIS area (to the extent possible without impacting other sensitive resources), with emphasis on both dispersed and developed recreation. Intensively interpret all of the resources of the EIS area.

Planned Actions:

- Designate the entire San Pedro as a special recreation management area.
- Prepare project plans for all proposed facilities.
- Apply the Limits of Acceptable Change (LAC) planning system.
- Make the San Pedro available for recreation research.
- Designate the entire EIS area under the ORV management regulations as "Limited to Designated Roads". Allow public vehicle use on designated roads only.
- Close the EIS area to the discharge of firearms except those associated with regulated hunting. Limit hunting to the period of September 1 to March 31. Close the area around developed facilities to hunting.
- Limit the length of stay at campgrounds to 7 days.
- Allow dispersed recreation.
- Restrict campfires to designated locations.
- Allow overnight use by permit only.
- Develop the Highway 90 area (San Pedro Ranch House):

  - 30-50 unit campground;
  - large visitor contact and interpretive facility;
  - interpretive display in the historic San Pedro Ranch House and also use the facility as the headquarters of the Friends of the San Pedro River;
  - interpretive trail to the river;
  - small picnic site and a group picnic site;
  - interpretive displays at the campground and picnic sites; and
  - highway pullout with information, directions and interpretive signs.

- Rebuild the San Rafael del Valle Road (Highway 90 to Hereford), as motorized interpretive route, and develop the following:

  - day-use only restriction,
  - graveled road,
  - 8-12 pullouts with interpretive displays;
  - up to 6 short spur roads to small parking areas;
  - up to 4 small picnic sites; and
  - 2 overlooks with interpretive displays.

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- Develop the following in the Hereford area:

  - 20-40 unit campground;
  - graveled access road;
  - parking area with interpretive display;
  - 2 small picnic sites; and
  - highway pullout with information, directions, and interpretive signs.

- Develop the following in the Fairbank area:

  - medium size visitor contact and interpretive facility;
  - parking area;
  - small picnic site; and
  - highway pullout with information, directions and interpretive signs.

- At the Presidio of Santa Cruz de Terrenate:

  - control access to the site; and
  - build an interpretive trail through the site.

- At the Boquillas Ranch:

  - build an interpretive display for the ranchhouse and an old railroad commissary building; and
  - restrict use of the area.

- Develop the following on the Babocomari River:

  - trail along the river using the old railroad grade;
  - small parking area and trailhead near the river's mouth; and
  - interpretive site.

- Develop the following on the Boquillas Road (road between Fairbank and Charleston):

  - day-use only restriction;
  - graveled road;
  - small picnic site; and
  - interpretive display at the Boston Mill ruins.

- Develop the Lewis Springs Road:

  - graded access road;
  - parking areas;
  - small picnic site; and
  - interpretive displays.

- Develop the following at Escapule Wash:

  - graded access road;
  - a small picnic site with interpretive display; and
  - restriction for day use only.

- Develop the following at Murray Springs:

  - interpretive display in a small building;
  - interpretive trail through the site; and
  - graded access road.

- Develop the following on the north end of the ElS area:

  - 10-15 unit primitive campground; and
  - a small picnic site.

- Develop the following at the Lehner Ranch:

  - interpretive display in a small building; and
  - an interpretive trail through the site.

- Develop the following in the Charleston area:

  - highway pullout with information, directions and interpretive signs;
  - interpretive display near the ruins;

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- foot trail to the ruins; and
- a small picnic site.

o Develop the following on the Sierra Ready Mix Road:

- graded access road;
- an overlook with interpretive display; and
- 2 small picnic sites.

o Develop the following at Palominas;

- highway pullout with information, directions and interpretive signs;
- 10-15 unit primitive campground;
- graded access road; and
- a small picnic site.

o Develop 2-3 dedicated outdoor environmental education field study areas of 5-10 acres each. Facilities will include shade shelters, tables, signs, and small parking areas. Access to and use of these sites will be restricted.

o There are two scenarios possible on recreation use of the existing railroad corridor.

- In one scenario the railroad track is abandoned and the privately owned right-of-way is obtained. BLM will develop a hiking and equestrian trail on the grade, along with access/parking/corrals at Hereford, Highway 90, Charleston, Fairbank, and on the north end of the EIS area;

- In the second scenario a privately run tourist train will use the existing track, with possible construction of a spur line to Tombstone. BLM will work with the operator on stops for the train, possibly including the installation of historic train stations. These facilities will use some private lands but may need the use of some of the EIS area adjacent to the tracks. BLM will develop access/parking/corrals at Hereford, Highway 90, Charleston, Fairbank, and on the north end of the EIS area for dispersed hiking and equestrian use.

Lands

Objective: Provide for future rights-of-way across the EIS area and for other lands actions compatible with the subject lands.

Planned Actions:

o Grant rights-of-way only in areas with no significant resource conflicts and/or in right-of-way corridors established at Charleston and Hereford.

o Allow maintenance on existing rights-of-way, subject to protection of resource values.

o Issue temporary use permits to the motion picture industry for filming in natural settings with no additional disturbance allowed.

Water

Objective: Allow for limited consumptive use of the groundwater resource while providing necessary support for other resource programs.

Planned Actions:

o Pump irrigation wells only as necessary to sustain and protect future water rights. When pumping, irrigate the lands associated with the pumped well

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AZ EE:4:3 (ASM), AZ EE:8:48 (ASM), and AZ EE:8:34 (ASM).

- Manage sites eligible for Scientific Use allocation to preserve scientific values and other cultural resource values.

Objective: Manage a small number of sites for Public Values (see Appendix 1).

Planned Actions:

- Promote the interpretation of cultural resources to provide the public with information on the history and prehistory of the area. Educate the public on the value of cultural resources.

- Allocate the following sites to Public Use (see Appendix 2): Presidio of Santa Cruz de Terrenate, Fairbank, Murray Springs site, Lehner site, Charleston, Millville (Gird and Corbin Mills), Boquillas Ranch headquarters, Brunckow cabin, San Pedro Ranch House, and Gaybanipitea.

- Complete stabilization work at the following sites to preserve public values and other identified values: Presidio of Santa Cruz de Terrenate, Fairbank, Charleston, Millville, Contention, Contention City, Grand Central Mill, Sunset Mill, the San Pedro Ranch House and the Boston Mill.

- Assure the preservation of scientific and other cultural resource values and achieve cultural resource objectives in the development and use of interpretive sites.

- Provide data and display items for public interpretation.

- Provide support in the planning, designing and development of interpretive sites.

- Identify socio-cultural values. Give full consideration to those values in the management of associated sites and areas.

Objective: Manage a few sites for Conservation (see Appendix 1) to protect and preserve representative samples of all cultural resources in the EIS area.

Planned Actions:

- Protect sites potentially eligible for allocation to Conservation for Future Use (see Appendix 2) to preserve their scientific and public values.

- Allocate a representative sample of sites in each historic context to Conservation for Future Use.

- Do not permit conflicting land and resource uses on allocated sites.

- Release sites from Conservation for Future Use only if they meet the required conditions (see Appendix 3 for the conditions).

Paleontological

Objective: Emphasize scientific research while preserving paleontological resources.

Planned Actions:

- Promote and fund the excavation and collection of the Dyack site, the Horsethief Draw Mammoth site, and the Horsethief No. 2 site.

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- o Promote and fund new paleontological research.

- o Conduct regular patrols to monitor site condition.

- o Collect significant fossils threatened by natural and human disturbance.

Minerals

Objective: Do not allow mineral activities in the sensitive portions of the EIS area.

Planned Actions:

- o Permit sand and gravel extraction operations outside the riparian area.

Visual

Objective: Manage the EIS area's visual resources to preserve the most outstanding scenery and to enhance areas impaired by human disturbance.

Planned Actions:

- o Designate the visual resources of the subject lands into the following Visual Resource Management classes (see Appendix 4):

  Class I: 850 acres
  Class II: 9,007 acres
  Class III: 13,982 acres
  Class IV: 23,829 acres

  Preservation oriented management will occur in the Class I areas (the proposed RNAs) and Class II areas (much of the scenic valley bottom along the San Pedro River). Enhancement actions will take place in those areas previously impacted by human disturbance.

Areas of Critical Environmental Concern (ACEC)

Objective: Preserve and enhance the identified special values of the EIS area.

Planned Actions:

- o Designate entire EIS area as the San Pedro Riparian ACEC. Accomplish management of this ACEC by applying the management direction for the Utilization Alternative.

- o Designate three research natural areas (RNA) within the ACEC -- St. David Cienega, 130 acres; San Pedro River, 550 acres; and San Rafael, 170 acres. In addition to area-wide constraints of the Utilization Alternative, permit no developments and new rights-of-way in the RNAs.

Administrative Facilities

Objective: Provide facilities in several locations to properly administer the EIS area.

Planned Actions:

- o Build an administrative facility at the Highway 90 location as part of the visitor contact and interpretive facility.

- o Build a small facility at Fairbank to administer the northern end of the EIS area.

- o Use the housing at Boquillas Ranch, Fairbank, Hereford and Palominas for employees or for use by cooperating agencies.

Research

Objective: Provide facilities for a variety of research in the EIS area.

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Planned Actions:

- Develop an adequate facility at either Fairbank or the Highway 90 area for research in the fields of biology, hydrology, archaeology, soils, paleontology and botany.

PREFERRED ALTERNATIVE

Theme Statement

The theme of the Preferred Alternative is to balance the resource protection and public use activities in the San Pedro EIS area. Protection and/or enhancement of wildlife, cultural, paleontological, vegetation and water resources is emphasized. Public use is allowed where natural resources are not significantly impacted.

Recreation

Objective: Provide for moderate recreation use of the EIS area (to the extent possible without impacting other sensitive resources), with both dispersed and developed recreation available. Intensively interpret all of the resources of the EIS area.

'lanned Actions:

- Designate the entire EIS area as a special recreation management area.
- 'repare project plans for all 'oposed facilities.
- oly the Limits of Acceptable 'e (LAC) planning system.
- 'e San Pedro available for 'n research.
- Designate the entire EIS area under the ORV management regulations as "Limited to Designated Roads". Allow public vehicle use on the designated roads.
- Close the EIS area to the discharge of firearms except those associated with regulated hunting. Limit hunting to the period of September 1 to March 31. Close the area around developed facilities to hunting.
- Limit the length of stay at campgrounds to 7 days.
- Allow dispersed recreation.
- Restrict campfires to designated locations.
- Allow overnight use by permit only.
- Develop the following in the Highway 90 (San Pedro Ranch House) area:

  - 30-50 unit campground;
  - large visitor contact and interpretive facility;
  - interpretive display in the historic San Pedro Ranch House and also provide the facility as the headquarters of the Friends of the San Pedro River support group;
  - interpretive trail to the river;
  - small picnic site;
  - interpretive displays at the campground and picnic sites; and
  - highway pullout with information, directions and interpretive signs.
- Rebuild the San Rafael del Valle Road (Highway 90 to Hereford) as motorized interpretive route and develop the following:

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- day use only restriction;
- graveled road;
- 7-10 pullouts with interpretive displays;
- up to 4 short spur roads to small parking areas;
- 2 small picnic sites; and
- 2 overlooks with interpretive displays.

o Develop the following in the Hereford area:

- 15-30 unit campground;
- graveled access road;
- parking area with interpretive display;
- a small picnic site; and
- highway pullout with information, directions, and interpretive signs.

o Develop the following in the Fairbank area:

- small visitor contact and interpretive facility;
- parking area;
- small picnic site; and
- highway pullout with information, directions and interpretive signs.

o At the Presidio of Santa Cruz de Terrenate:

- control access to the site, and
- build an interpretive trail through the site.

o At the Boquillas Ranch:

- build an interpretive display for the ranchhouse and an old railroad commissary building; and

- restrict use of the area.

o Develop the following on the Babocomari River:

- trail along the river using the old railroad grade;
- small parking area and trailhead near the river's mouth; and
- interpretive site.

o Develop the following on the Boquillas Road (road between Fairbank and Charleston):

- graveled road, and
- designate as closed to public use from Boquillas Ranch to Charleston.

o Develop the following on the Lewis Springs Road:

- graded access road;
- parking areas;
- a small picnic site;
- a group picnic site; and
- interpretive displays.

o Develop the following at Murray Springs:

- an interpretive display;
- an interpretive trail through the site; and
- a graded access road.

o Develop the following at the Lehner Ranch:

- interpretive display, and
- interpretive trail through th site.

o Develop the following in t Charleston area:

- highway pullout with inform tion, directions and interpr tive signs;
- an interpretive display n the ruins;
- foot trail to the ruins; and
- a small picnic site.

o Develop the following on Sierra Ready Mix Road:

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to encourage growth of vegetative cover and improve wildlife habitat.

- Use wells on an emergency basis to supplement surface flow to protect an endangered resource (such as fish populations or riparian habitat).

- Use non-irrigation wells to provide water in support of the various resource and administrative activities in the EIS area.

- Close and cap unneeded and unnecessary irrigation and non-irrigation wells.

Wildlife

Objective: Determine the condition and status of wildlife and their habitat.

Planned Actions:

- Inventory terrestrial and aquatic habitats.

- Inventory terrestrial and aquatic vertebrates along with their associated food supplies.

- Monitor changes in terrestrial and aquatic habitats.

- Mitigate potential impacts to terrestrial and aquatic habitats to assure existing habitat diversity through time.

- Identify special management guidance to protect areas important for raptors and herons.

- Prepare a habitat management plan (HMP) for the EIS area.

Objective: Provide for the reintroduction of native Threatened and Endangered species.

Planned Actions:

- Develop habitat improvement projects as agreed upon through consultation requirements of the Endangered Species Act.

- Develop plans for the removal of exotic fish from existing ponds in cooperation with AGFD.

Objective: Emphasize the nonconsumptive use of fish and wildlife while accommodating some consumptive use.

Planned Actions:

- Do not allow trapping in the EIS area.

- Allow wildlife species collections only for administrative purposes. Coordinate these collections with AGFD.

- Pursue establishment by AGFD of hunting regulations for the EIS area. This relates to length of season, time of season and types of weapons permitted.

- Analyze the potential for wildlife related research in the EIS area.

- Establish interpretive and environmental education programs on wildlife and their habitat, with emphasis on the riparian ecosystem.

Vegetation

Objective: Emphasize the natural succession of vegetation communities.

Planned Actions:

- Do not allow vegetation plantings except Threatened and Endangered species project.

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- o Accomplish vegetation changes naturally or by the use of prescribed fire.

Soils/Watershed

Objective: Maintain and enhance the soils/watershed resources of the EIS area.

Planned Actions:

- o Build structures in side channels if necessary for erosion control, flood control or watershed protection.
- o Build contour dikes on the eroded areas on the northwest side of the EIS area (south of St. David).
- o Build dikes and gully plugs on side drainages as needed.

Fire

Objective: Control wildfires threatening natural resources and structures and reduce the acreage burned.

Planned Actions:

- o Suppress wildfires on a high priority basis. All wildfires on or threatening to burn into the EIS area will receive full and sustained suppression action.

Cultural

Objective: Preserve cultural resources.

Planned Actions:

- o Prepare a Cultural Resource Management Plan (CRMP) for the EIS area.
- o Allocate all sites to one or more of the following use categories: Scientific Use, Management Use, Public Use, Socio-cultural Use, and Conservation for Future Use (see Appendix 2 for definitions of these categories.
- o Nominate eligible properties to the National Register of Historic Places.
- o Manage sites to realize their allocated use while protecting the site's other cultural resource values from impact.
- o Complete a Class III intensive field inventory of the entire EIS area and record all cultural resources.
- o Maximize the efficiency and quality of site management through the development of cooperative management agreements and the use of volunteers.

Objective: Manage a majority of sites for their Information Potential (see Appendix 1).

Planned Actions:

- o Promote scientific study to gain knowledge on all the cultural resources in the EIS area, to fulfill regional research objectives, and to fill regional data gaps (Bronitsky and Merritt, 1986).
- o Fund scientific studies when appropriate to meet priority regional research objectives.
- o Identify scientific research objectives by historic context for the EIS area.
- o Allocate the following sites to Scientific Use (see Appendix 2): AZ EE:8:1 (ASM), AZ EE:8:5 (ASM), AZ EE:8:7 (ASM), AZ EE:8:4 (AMF), Benson 8:3 (GP), SPII-10, SPII-16, SPII-20,

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- graded access road;
- an overlook with interpretive display; and
- 2 small picnic sites.

o Develop the following at Palominas:

- highway pullout with information, directions and interpretive signs;
- graded access road; and
- a small picnic site.

o Develop 2-3 dedicated outdoor environmental field study areas of 5-10 acres each. Facilities will include shade shelters, tables, signs, and small parking areas. Restrict access to and use of these sites.

o There are two scenarios possible on recreation use of the existing railroad corridor.

- In one scenario the railroad track is abandoned and the privately owned right-of-way is obtained. BLM will develop a hiking and equestrian trail on the grade, along with access/parking/corrals at Hereford, Highway 90, Charleston, Fairbank, and on the north end of the EIS area;

- In the second scenario a privately run tourist train will use the existing track, with possible construction of a spur line to Tombstone. An environmental assessment will be written before construction begins. BLM will work with the operator on stops for the train, possibly including the installation of historic train stations. These facilities will use some private lands but may need the use of some of the EIS area adjacent to the tracks. BLM will develop access/parking/corrals at Hereford, Highway 90, Charleston, Fairbank, and on the north end of the EIS area for dispersed hiking and equestrian use.

Lands

Objective: Provide for future rights-of-way across the EIS area and for other lands actions compatible with the subject lands.

Planned Actions:

o Restrict rights-of-way and other uses to areas where they would not significantly impact resources.

o Allow maintenance on existing rights-of-way, subject to protection of resource values.

o Designate a right-of-way corridor at Charleston. The northern boundary is no farther north than the existing northern right-of-way and the southern boundary is 660 feet south.

o Designate a right-of-way corridor at Hereford. The northern boundary is the southern and western edge of the Hereford Road. The southern boundary follows the established utility easement on the southern San Rafael grant line. The corridor is 150 feet in width.

o Issue temporary use permits for motion picture filming. Restrict filming to natural settings with no additional disturbance allowed.

Water

Objective: Conserve the groundwater resource while providing necessary support for other programs.

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Planned Actions:

- Pump most of the irrigation wells only to protect potential water rights. Protect water rights if the San Pedro Watershed is designated as an Active Management Area. Pump for an emergency use if a resource value becomes jeopardized (such as fish populations due to reduced surface flow).
- Use one well on a short-term basis in one field for an experimental revegetation trial.
- Keep some of the non-irrigation wells operational to provide the required water for various resource activities and for administrative purposes.
- Close and cap unnecessary irrigation and non-irrigation wells.

Wildlife

Objective: Determine the condition and status of wildlife and their habitat.

Planned Actions:

- Inventory terrestrial and aquatic habitats.
- Inventory terrestrial and aquatic vertebrates along with their associated food supplies.
- Monitor changes in terrestrial and aquatic habitats.
- Mitigate potential impacts to terrestrial and aquatic habitats to assure existing habitat diversity through time.
- Prepare a habitat management plan (HMP) for the EIS area.
- Identify special management guidance to protect areas important for raptors and herons.
- Evaluate in cooperation with AGFD, the impact of hunting on wildlife and wildlife habitat.
- Evaluate the impact of visitor use on wildlife and the riparian ecosystem. Determine if these impacts are consistent with the overall management of the riparian ecosystem and the associated wildlife resource.

Objective: Emphasize consumptive and nonconsumptive use of fish and wildlife.

Planned Actions:

- Do not allow trapping in the EIS area.
- Minimize human disturbance around important wildlife areas.
- Allow wildlife species collections only for administrative purposes. Coordinate collections with AGFD.
- Analyze the potential for wildlife related research in the EIS area.
- Establish interpretation and environmental education programs on wildlife and their habitat, with emphasis on the riparian ecosystem.
- Pursue establishment by AGFD of hunting regulations for the EIS area. This relates to length of season, time of season, and the types of weapons permitted.

Objective: Provide for the reintroduction of native wildlife species, including Threatened and

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Endangered species. Use habitat improvements to optimize habitat availability.

Planned Actions:

- Plant one abandoned farm field, on an experimental basis, with preferred forage species.
- Use prescribed fires to improve terrestrial habitat.
- Develop ponds and marshes for aquatic and terrestrial wildlife.
- Plant native trees (seedlings and poles) along the riparian corridor and other areas where desirable to enhance wildlife habitat.
- Pump non-irrigation wells in support of aquatic habitat improvements. Pump irrigation wells for emergency use if a resource become jeopardized (such as fish populations due to reduced flows).
- Provide wildlife waters in the drier upland portions of the EIS area.
- Provide habitat for terrestrial wildlife species that use tree cavities (holes) through placement of nest boxes or other methods.

Vegetation

Objective: Maintain and enhance the vegetation communities in the EIS area.

Planned Actions:

- Use an abandoned farm field for experimental reseeding/revegetation plantings of native species. Use some non-native species now found in the area and considered beneficial. If the experimental reseeding is successful and beneficial, consider using it in other areas. Natural plant succession would occur on most of the EIS area. Plant trees in areas that can support wildlife and recreation activities. Consider streambank revegetation where necessary.
- Use prescribed fire to maintain wildlife habitat diversity and to reduce hazardous build-up of fuels.
- Establish, if desirable, a native tree nursery.

Soils/Watershed

Objective: Maintain and enhance the soils/watershed resources of the EIS area to reduce future soil erosion.

Planned Actions:

- Remove the dikes or berms along the east and west sides of the abandoned farm fields and allow pre-existing drainages to re-establish.
- Build side drainage erosion control structure only as needed to protect other resources and watershed values.

Fire

Objective: Control wildfires threatening natural resources and structures and reduce the acreage burned.

Planned Actions:

- Suppress wildfires on a high priority basis. All wildfires on or threatening to burn into the EIS area will receive full and sustained suppression action.

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- Reduce the potential for damage to resources and structures within the EIS area and to adjacent land owner's properties. Do this by using fire breaks, both natural and constructed, as determined by resource and fire objectives. Emphasize the following areas: the southwest portion of the EIS area, where extensive fuels are within one mile of private dwellings; in the vicinity of the El Paso Natural Gas pipeline; and near any structures within the property.

Cultural

Objective: Preserve cultural resources.

Planned Actions:

- Prepare a Cultural Resource Management Plan (CRMP) for the EIS area.
- Allocate each site to one or more of the following use categories: Scientific Use; Management Use, Public Use; Socio-cultural Use; and Conservation for Future Use (see Appendix 2 for definitions of these categories).
- Nominate eligible properties to the National Register of Historic Places.
- Manage sites to realize their allocated use while protecting the sites' other cultural resource values from impact.
- Complete a Class III Intensive Field Inventory of the entire EIS area and record all cultural resources.
- Maximize the efficiency and quality of site management through the development of cooperative management agreements and the use of volunteers.

Objective: Manage a majority of sites for their Information Potential (see Appendix 1).

Planned Actions:

- Promote scientific study to gain knowledge on all of the cultural resources in the EIS area, to fullfill regional research objectives, and to fill regional data gaps (Bronitsky and Merritt, 1986).
- Fund scientific studies when appropriate to meet top priority regional research objectives.
- Identify scientific research objectives by historic context for the EIS areas.
- Allocate the following sites to Scientific Use (see Appendix 2): AZ EE:8:1 (ASM); AZ EE:8:5 (ASM); AZ EE:8:7 (ASM); AZ EE:8:4 (AMF); Benson 8:3 (GP); SPII-10; SPII-16; SPII-20; AZ EE:4:3 (ASM); AZ EE:8:48 (ASM); AZ EE:8:34 (ASM).
- Manage sites eligible for Scientific Use allocation to preserve scientific values and other cultural resource values.

Objective: Manage a small number of sites for Public Values (see Appendix 1).

Planned Actions:

- Promote the interpretation of cultural resources to provide the public with information on the area's history and prehistory. Educate the public on the value of cultural resources.

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- o Allocate the following sites to Public Use (see Appendix 2): Presidio of Santa Cruz de Terrenate, Fairbank, the Murray Springs site, the Lehner Site, Charleston, Millville (Gird and Corbin Mills), the Boquillas Ranch headquarters, the Brunckow cabin, the San Pedro Ranch house and Gaybanipitea.

- o Complete stabilization work at the following sites to preserve public values and other identified values: Presidio of Santa Cruz de Terrenate, Fairbank, Charleston, the Brunckow cabin, the Carr Canyon school, Millville, Contention, Contention City, the Grand Central Mill, the Sunset Mill and the San Pedro Ranch house.

- o Assure the preservation of scientific and other cultural resource values and achieve cultural resource objectives in the development and use of interpretive sites.

- o Provide data and display items for public interpretation.

- o Provide support in the planning, designing, and development of interpretive sites.

- o Achieve cultural resource management objectives in development plans, designs, development actions, and operations.

- o Identify socio-cultural values and give full consideration to these values in the management of associated sites and areas.

Objective: Manage a few sites for Conservation (see Appendix 1) to protect and preserve representative samples of all the cultural resources in the EIS area.

Planned Actions:

- o Protect sites potentially eligible for allocation to Conservation for Future Use (see Appendix 2) to preserve their scientific and public values.

- o Allocate a representative sample of sites in each historic context to Conservation for Future Use.

- o Do not allow conflicting land and resource uses on allocated sites.

- o Release sites from Conservation for Future Use only if they meet the required conditions (see Appendix 3 for the conditions).

Paleontological

Objectives: Preserve and enhance the scientific and potential public use values of paleontological resources to increase the knowledge of San Pedro EIS area's natural history.

Planned Actions:

- o Inventory any future land acquisitions for paleontological resources.

- o Check known sites periodically (every 3-5 years) and to collect exposed fossils.

- o Check high potential areas periodically.

- o Promote the excavation and collection of the Dyack site, Horsethief Draw Mammoth site, and Horsethief No. 2 site.

- o Promote new paleontological research.

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- o Protect significant paleontological resources by controlling other resources and land uses through avoidance, mitigation and other measures.

- o Collect significant fossils threatened by natural and human disturbance.

Minerals

Objective: Do not allow mineral activities in the sensitive portions of the EIS area.

Planned Actions:

- o Prohibit gravel extraction operations in the riparian area.

- o Allow the existing operation outside the riparian area to continue until the material under the already stripped area is removed. Issue new contracts on an annual basis.

Visual

Objective: Manage the EIS area's visual resources to preserve the outstanding scenery and to enhance areas impaired by human disturbance.

Planned Actions:

- o Designate the visual resources of the subject lands into the following Visual Resource Management classes (ses Appendix 4):

  Class I: 2,060 acres
  Class II: 8,311 acres
  Class III: 11,926 acres
  Class IV: 25,371 acres

  Preservation oriented management will occur in the Class I areas (the proposed RNAs) and Class II areas (most of the scenic valley bottom along the San Pedro River). Enhancement actions will take place in those areas previously impacted by human disturbance..

Areas of Critical Environmental Concern (ACEC)

Objective: Preserve and enhance the identified special values of the EIS area.

Planned Actions:

- o Designate the entire EIS area as the San Pedro Riparian ACEC. Accomplish management of the ACEC by applying the management guidelines of the Preferred Alternative.

- o Designate three research natural areas (RNA) within this ACEC -- St. David Cienega, 350 acres; San Pedro River, 1,340 acres; and San Rafael, 370 acres. In addition to the area-wide constraints of the Preferred Alternative, permit no developments and new rights-of-way in the RNAs..

Administrative Facilities

Objective: Provide facilities in several locations so as to properly administer the EIS area.

Planned Actions:

- o Build an administrative facility at the Highway 90 location as part of the visitor contact and interpretive facility.

- o Build a small facility at Fairbank to administer the northern end of the EIS area.

- o Use the housing at Boquillas Ranch, Fairbank, Hereford and Palominas for employees or for use by cooperating agencies.

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Research

Objective: Provide facilities for a variety of research in the EIS area.

Planned Actions:

- Develop an adequate facility at either Fairbank or the Highway 90 area for research in such fields as biology, hydrology, archaeology, paletontology, soils and botany.

ENVIRONMENTAL IMPACTS SUMMARY

The No Action Alternative proposes no actions which would create environmental disturbances. The impacts are, therefore, those which could be anticipated from taking no action. Such impacts would be the economic component through loss of economic returns from recreation and from sand and gravel extraction. The inability to recreate on the property would have some social impacts as many people anticipate being able to do so. Additionally, if the public cannot recreate on the San Pedro property, they may elect to do so on other public lands, creating environmental impacts on those lands. Beneficial effects are anticipated to water, wildlife, and vegetation and soil.

The Preservation Alternative proposes some actions that would benefit the natural resources such as water, wildlife, vegetation and soil/watershed. Wildlife habitat improvement projects could impact cultural and paleontological resources but would positively affect wildlife species. They would also improve dispersed recreation activities by providing a greater diversity of species. Construction of the St. David detention dam would adversely affect cultural and paleontological resources but would positively affect erosion processes and riparian vegetation by regrading the stream channel. Social and economic effects are very nearly the same as No Action but with a slightly more positive effect.

Implementing the Utilization Alternative would negatively impact water quality, wildlife, vegetation, soils and cultural/paleontological resources. These impacts are due largely to the greater emphasis on developed recreation and the continued extraction of sand and gravel off the riparian corridor. The same emphasis would benefit the economic and social components. Some of the management actions of this alternative would also positively affect wildlife habitat, water, soils and vegetation.

The Preferred Alternative would have actions impacting wildlife, soils, cultural/paleontological, vegetation, water, visual resources and the economic component. Other actions would provide positive impacts to the same resources. Most impacts are minor and reflect short-term vs long-term effects.

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TABLE 2-1
MANAGEMENT ACTION SUMMARY

BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Management Actions	No Action	Preservation	Utilization	Preferred
RECREATION				
ORV Designation	None	Closed	Limited to designated roads.	Limited to designated roads.
Public Vehicular Access	None	Designated parking areas - no roads	Large number of designated roads available.	Limited number of roads available.
Public Use	None	Available with limitations	Available	Available
Firearms	Prohibited	Prohibited	Restricted to regulated hunting.	Restricted to regulated hunting.
Developed Recreation Sites	No developed sites.	No large sites - 5 small sites.	4 large sites; 12 small sites.	4 large sites; 9 small sites.
Dispersed Recreation	None	Available - limited to day use only.	Available - permit for overnight use.	Available - permit for overnight use.
VISUAL RESOURCES	No VRM classification.	92% of scenic riparian corridor in VRM Class I & II.	84% of scenic riparian corridor in VRM Class I & II.	86% of scenic riparian corridor in VRM Class I & II.
ACEC DESIGNATION	None	1 ACEC of entire San Pedro; 3 RNAs.	1 ACEC of entire San Pedro; 3 small RNAs.	1 ACEC of entire San Pedro; 3 RNAs.

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Management Actions	No Action	Preservation	Utilization	Preferred
LANDS				
Maintenance of Existing ROWs	Yes	Yes	Yes	Yes
Protective Withdrawals for Administrative Purposes	Yes	Yes	Yes	Yes
Acquire Additional Lands	Yes	Yes	Yes	Yes
Allow New ROWs	No	Yes	Yes	Yes
WATER				
Maintain Quality and Quantity	Yes	Yes	Yes	Yes
Develop Springs	No	No	No	No
Use Irrigation Wells	No	Yes, if needed.	Yes, as necessary.	Yes, as necessary.
Use Non-Irrigation Wells	No	Yes, as necessary.	Yes, as necessary.	Yes, as necessary.
WILDLIFE HABITAT				
Upper San Pedro River HMP	No	Yes	Yes	Yes

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Management Actions	No Action	Preservation	Utilization	Preferred
Maintain or Improve Wildlife Species Diversity	Yes	Yes	Yes, only projects required for T&E species.	Yes
Maintain or Improve the Riparian Eco-System	Yes	Yes	Yes	Yes
Maintain or Improve Aquatic Habitat	No. Natural processes only.	Yes	No, except for T&E.	Yes
Reintroductions of Native Wild-life Species	No	Yes	Only T&E species.	Yes
Exotic Fish Removal	No	No	No	Yes
Monitor Habitat Changes	Yes	Yes	Yes	Yes
Vegetation Mani-pulation Projects	No	Yes	Yes, only for T&E Species.	Yes
WATERSHED				
Main Channel Detention Dam Construction	No	Yes	No	No

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Management Actions	No Action	Preservation	Utilization	Preferred
Erosion Control Structures - Main Channel	No	Yes	No	No
Erosion Control Structures - Side Drainages	No	Yes	Yes	Yes
Remove Dikes and Berms Around Farm Fields	No	Yes	No	Yes
VEGETATION				
Plant Abandoned Farm Fields to Native Species	No	Yes	No	Yes, but limited.
Plant Trees for Wildlife or Recreation	No	Yes	No	Yes
Prescribed Fire	No	Yes	Yes	Yes
FIRE				
Suppress Wildfire	Yes	Yes	Yes	Yes
MINERALS				
Gravel Production in the Riparian Area	Prohibited	Prohibited	Prohibited	Prohibited

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Management Actions	No Action	Preservation	Utilization	Preferred
Gravel Production Outside the Riparian Area	No	No	Yes	Existing operation only.
CULTURAL				
Scientific Study of Cultural Resources	Allow (limited)	Allow	Allow	Promote, fund
Patrol of Cultural Sites	Occasional	Regular	Regular	Regular
Public Use of Cultural Sites: Interpretive Sites	No	No	Yes, 11 sites.	Yes, 10 sites.
Allocate Cultural Sites for Conservation	No	Yes	Yes	Yes
On Site Protection	Yes	Yes	Yes	Yes
Cultural Resource Activity Plans	No	Yes	Yes	Yes
RESEARCH CENTER				
Build Center	No	Yes, small	Yes	Yes
ADMINISTRATIVE FACILITIES				
Build facility	No additional.	Expand existing facility.	New facility.	New facility.

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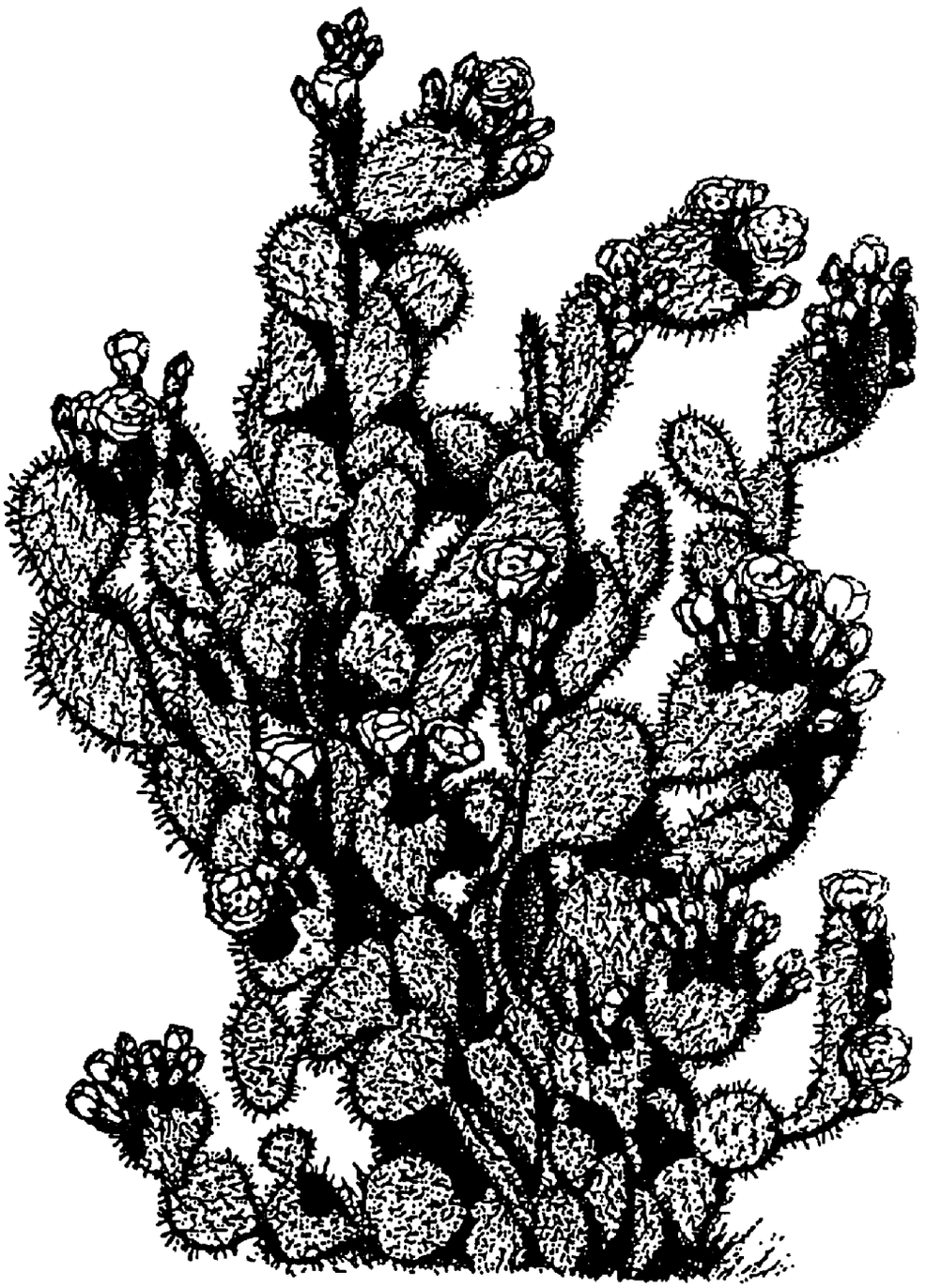
CHAPTER 3



CHAPTER 3
AFFECTED ENVIRONMENT

INTRODUCTION

Chapter 3 describes the resources that may be impacted by implementing the alternatives including the Preferred Alternative. Descriptions are only as detailed as needed for the reader to understand the effects of implementation. Where impacts are slight or nonexistent (climate, topography, air quality, natural history), descriptions are brief or omitted. More detailed descriptions of the resources of the EIS area are available in the Safford District Office.

PHYSICAL SETTING

The EIS area lies in the Basin and Range physiographic province, characterized as possessing gently sloping valleys separated by abruptly rising mountains. Such is the case where the San Pedro valley separates the Dragoon and Mule Mountains to the east from the Huachuca and Whetstone Mountains to the west. The elevation is about 3,900 ft.. The climate is arid to semi-arid. Summers are warm, averaging 95° daily maximum in June. Winters are relatively mild with average maximum in January of 61° with lows of 34°. Precipitation averages about 13" annually with 50-60% of that total falling in July-September and 20% in December-February.

RECREATION

Recreation has not been a recognized use of the San Pedro EIS area, primarily because the land was previously in private ownership. A small amount of hunting was selectively authorized by the owners. Other occasional uses include birdwatching, nature study, picnicking and sightseeing. The area between the two land grants, centering on Escapule Wash, received extensive use from off-road vehicles.

The San Pedro offers many opportunities for a variety of recreational activities. During the public meetings many people identified potential uses of the San Pedro, e.g. camping, hiking, picnicking, nature study, birdwatching and interpreting the natural, cultural and paleontological resources.

SPECIAL AREAS (Potential Areas of Critical Environmental Concern - ACEC)

The San Pedro EIS area has significant examples of archaeological and historical sites, a perennial stream, wildlife populations, paleontological resources and vegetation communities. These special features are enough to meet the relevance and importance criteria for ACECs and to qualify as RNAs. The San Pedro lands encompass several vegetation types that are either not represented or only minimally represented in the RNA program. The RNA program does not have any representation of the Chihuahuan Desert scrub, sacaton grassland, mesquite bosque and cienega vegetation types. The cottonwood-willow riparian vegetation type is only minimally represented. The San Pedro offers an opportunity to fill these voids. Brief descriptions of the nominated ACEC and RNAs are as follows:

San Pedro Riparian: This potential ACEC covers the entire San Pedro property and includes 36 miles of the San Pedro River (partly perennial), extensive stands of cottonwood-willow riparian vegetation, many significant archaeological, historical and paleontological

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sites, and a wide variety of wildlife.

St. David Cienega: The potential RNA at the cienega is a remnant of what much of the San Pedro River Valley used to look like. The marshlike cienega has a vegetation type dominated by reeds and sedges. Also in this potential RNA are a small mesquite bosque, a grassland area seasonally impacted by water, and small areas of Chihuahuan Desert scrub vegetation.

San Pedro River: This potential RNA contains the cottonwood-willow riparian vegetation type. Bordering the riparian area is an extensive mesquite bosque. The eastern portions of this area contains the Chihuahuan Desert vegetation type, characterized by creosote, tarbush and catclaw.

San Rafael: This potential RNA is dominated by grasslands, with alkali and giant sacaton the most common. Running through this grassland area is the San Pedro River with an excellent representation of the cottonwood-willow riparian vegetation type.

VISUAL

The riparian forest along the San Pedro River is the most recognizable visual feature of the San Pedro property. This is especially true where the four primary highways cross the river. The riparian forest offers a dramatic visual change from the surrounding country's vegetation, dominated by such Chihuahuan Desert shrubs as creosote, catclaw, tarbush, whitethorn and mesquite.

In the larger picture, the San Pedro EIS area occupies the valley bottom of the upper San Pedro River Valley. Most of the country to the east and west is dominated by gently sloping valley terraces with many small drainages. The only major break in the valley's topography is near the center of the property, where the Charleston Hills rise above the surrounding landscape. Long distance views are available from the EIS area--the Mule and Dragoon Mountains and the Tombstone Hills to the east, the Huachuca and Whetstone Mountains to the west, and the San Jose Mountains to the south in Mexico.

Though generally natural in appearance, the San Pedro property has been modified over the last 100 years. These changes include four paved roads crossing the property and many graded and dirt roads, electric and telephone lines, and several towns. In addition, some ranch houses and ranch facilities, an active railroad line and several old railroad grades, and about 2,200 acres of old farm fields.

Scenic vistas from highways and the San Pedro River are important because of the associated sightseeing values. Two major attractions to recreationists are water and the riparian forest. Protecting views of these features is a concern.

Designation of visual resource management classes has not occurred on the public lands in the San Pedro EIS area. A visual resources management (VRM) inventory was completed for the entire San Pedro area regardless of land ownership. BLM will manage visual resources only on the public lands. (See Appendix 4 for a discussion of Visual Resource Management).

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LANDS AND REALTY

Land Uses

Activities occurring when BLM obtained the land consisted of livestock grazing, sand and gravel operations, rights-of-way and some unauthorized recreation uses. Neighboring lands have these same uses with the addition of rural residences and subdivisions. Southern Cochise County is one of the fastest growing areas of southeastern Arizona for this type of use.. The Escapule subdivision and its residences (about 200 acres in sections 18 and 19, T. 21 S., R. 22 E.) are located just north of the San Rafael del Valle land grant, bordering the EIS area. Military operations occur on the adjacent lands of Fort Huachuca.

State Highways 82, 90 and 92 cross the San Pedro property. Two Cochise County roads, Charleston and Hereford, also provide access to the planning area. The Charleston road is a deeded easement, except the San Pedro River crossing where it has a right-of-way. The Southern Pacific Railroad (Benson to Douglas rail line), crosses the planning area north to south. This is also a fee right-of-way.

Many rights-of-way including natural gas pipelines, water pipelines, utility easements, powerlines, roads and telephone lines cross the EIS area. Noticeable concentrations are at the Charleston River crossing and in the Hereford-Palominas area. Most were authorized by the previous landowner. BLM has granted rights-of-way for new bridges at the Charleston and Hereford crossings of the San Pedro River. An environmental assessment will be prepared before final location and construction of the new bridges. See Table 3-1 for the listing of these rights-of-way.

The St. David Irrigation District has a damsite and canal in the northern part of the San Juan de las Boquillas land grant. The dam diverts water into the canal for use on fields near St. David. The permit for the dam expires on July 28, 1988. BLM has issued a right-of-way for this canal.

In 1987 Arizona Electric Power Cooperative applied to construct a 230 kv electric line from the Apache Power Plant near Sunsites to Sierra Vista. BLM issued a right-of-way for the selected route, including a crossing of the San Pedro River at Charleston.

Certain sites within the EIS area where there are existing facilities may be designated as administrative sites. Such sites include the Boquillas Ranch, the current BLM administrative site at Fairbank, and any other developed recreation, research or administrative facilities.

Acquisition

Several additional parcels of private land may be obtained for protection of the riparian values, the water table and to help provide continued flow in the San Pedro River. Private exchanges are being negotiated that may lead to acquisition of these lands. The private lands are also valuable for protection of wildlife and cultural and historic properties.

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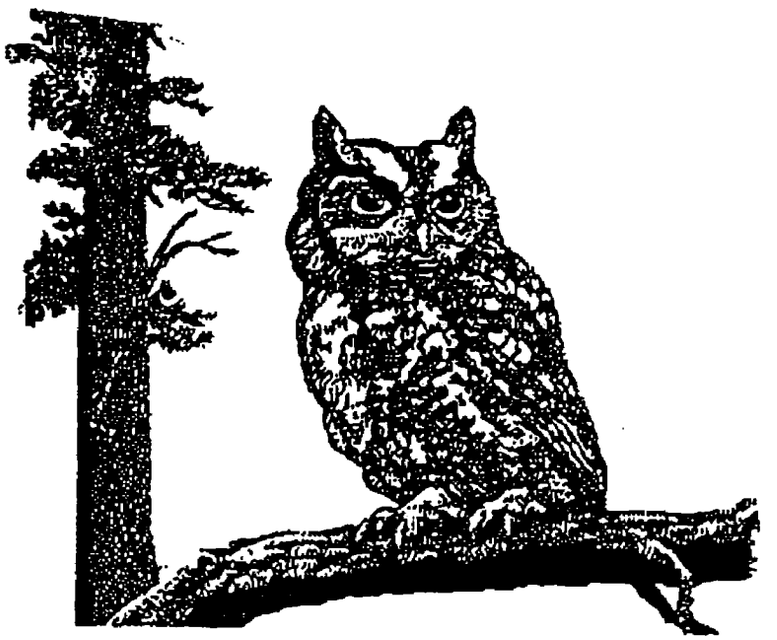
TABLE 3-1
Rights-of-Way
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Holder	Type	Feet/Acres
Sulphur Springs Valley Electric Coop., Inc.	Powerline	57,132/32
Mountain Bell	Telephone	85,641/20
El Paso Natural Gas	Gas Pipeline	18,424/9
City of Tombstone	Water Pipeline	90,710/208
Arizona Public Service	Powerline	19,430/5
Cochise County	Road	37,000/59
William D. Glenn	Road	2,250/5
Arizona Department of Transportation	Road	25,932/147
St. David Irrigation	Dam, Canal, Road	9,140/53
Bob & Janet Watkins	Utility Easement	3,500/1
1st Interstate Bank	Road	2,460/1.4
Cochise County	Charleston Bridge	2,400/33.1
Cochise County	Hereford Bridge	2,950/40.6
Arizona Electric Power Cooperative, Inc.	Powerline and Access Roads	95,315/142.46

Source: Safford District Files



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WATER

This description consists of selections from a detailed discussion of water attached as Appendix 5.

Surface Water

The San Pedro River starts in the desert grasslands of northern Sonora, Mexico. The river flows north for about 140 miles, entering the Gila River near Winkelman Arizona. Its watershed of over 4000 square miles includes most major vegetational life zones of North America. These range from coniferous forests on mountains higher than 7400 feet above mean sea level to Sonoran desert scrub at 1800 feet elevation near the river's mouth. Much of the mainstream flows through structural basins over valley fill approaching or exceeding 1000 feet thick. Its floodplain is usually a half mile or more wide, except where bedrock outcrops approach the stream near the Charleston area. Bedrock near the surface also promotes emergence of subterranean water, insuring sections of perennial flow. Zones of strong artesian pressure occur in the vicinity of Palominas, Hereford, St. David and Benson.

The total watershed area of the San Pedro River is 4,483 square miles (696 square miles in Mexico). The watershed for the San Pedro River upstream from Benson is 2,500 square miles.

Surface flows in the San Pedro River occur as both rainfall runoff and groundwater discharge. The highest annual flows occur in the July-September period in response to short-duration, high-intensity thunderstorms. These storms can cause flash floods, characterized by extremely rapid rises, high peak flow rates, and rapid declines. A secondary period of rainfall runoff occurs in the winter, producing much lower peak flow rates. Annual low flow periods commonly are in May-June and November.

Baseflows of the San Pedro River represent discharge from the floodplain aquifer. This flow is recharged both by the regional aquifer system and by rainfall-induced high flows. The river is perennial from the Hereford area to just below the Charleston Hills due to the discharge of groundwater to the stream. However, base flows in perennial reaches are highly variable depending on distance downstream. During the hot, dry season, the river north of the Fairbank area disappears into the streambed, reappearing for short stretches farther downstream.

All of the tributaries of the river within the EIS area have ephemeral flow, except the Babocomari River. The segment of the Babocomari River within the EIS area has an intermittent flow, but it is usually perennial during wet years. This stream flows into the San Pedro River near Fairbank. Green Brush Draw is another of the important tributaries, with its confluence to the San Pedro River located north of Palominas. The headwaters for Green Brush Draw start south of Bisbee and east of Naco, Arizona and Naco, Mexico. The flow is ephemeral and occurs only after intense or long-duration storms.

The other surface water sources consist of eight permanent springs, one stock pond and several holding ponds. Some of the holding ponds, outside the riparian area, are in the vicinity of an active gravel pit. The other ponds are in an area previously used for a sand removal and washing operation. The springs are all undeveloped.

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Discharge Data

The U.S. Geological Survey operates three stream gages in or adjacent to the EIS area at Palominas, Charleston, and near Tombstone (north of Fairbank). Table 5-1 in Appendix 5 describes streamgage information and Period-of-Record for each gage.

Gain-Loss Analysis

The analysis of the streamgage data at Palominas, Charleston and Tombstone suggests that the San Pedro River baseflows increase greatly between Hereford and Charleston, and then decrease somewhat at the Tombstone gage.

Putman et al (1987) suggest two reasons for the large gains in base flows between Palominas and Charleston. First, this is an area of recharge to the floodplain aquifer from the regional aquifer. In fact, several wells in the region which tap into the regional aquifer are under artesian conditions. Secondly, bedrock at the Charleston Hills immediately downstream of the Charleston gage is believed to serve as a barrier to shallow groundwater flow, thus forcing shallow groundwater to the surface.

The gain-loss analysis clearly shows the close interdependency between surface water flows and the groundwater system.

To further quantify baseflow gains and losses within the study reach, BLM selected seven locations for regular stream gaging. The results, as of May 1986, of that gaging record suggest that the streamflows increase an average of 27 percent between Hereford and the Highway 90 bridge. A 49 percent increase occurs between the Highway 90 bridge and Charleston. From Charleston to a location just downstream of the Charleston Hills flows decreased an average of 5.4 percent. Between Charleston Hills and the bridge at Fairbank flows increased by an average of 5.3 percent. Average discharge then increased by 9 percent between the Fairbank and Tombstone gages, decreasing by 16.6 percent between the Tombstone and St. David diversion gages.

Groundwater

Hydrogeologic Setting

The Upper San Pedro Basin contains several hundred feet of consolidated and unconsolidated sedimentary deposits, most of which are capable of transmitting ground water. These deposits may be more than a thousand feet thick in the southern part of the Upper San Pedro drainage basin. Here, Basin and Range type faulting has produced a deep graben structure allowing extremely thick deposits of sedimentary materials to accumulate. The geologic layers of importance in the EIS area are the lower and upper units of the basin fill and the overlying floodplain deposits. These units form the regional and floodplain aquifers, respectively.

Groundwater/Streamflow Relationships

The saturated basin fill is an integral part of the groundwater/-streamflow regime in the Upper San Pedro Basin. Groundwater contributes flow to the San Pedro River from two sources: the basin fill and the underflow within the floodplain aquifer.

Groundwater in the Riparian Zone

The riparian zone is part of the flood plain aquifer. The sediments

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of the floodplain aquifer are generally very porous, and water easily transmits through the gravel and sand of this unit. Permeability is much higher in the floodplain sediments than in the basin fill deposits.

In order to evaluate and document the existence of ground water within the riparian zone, BLM installed 11 well points within the floodplain sediments between Hereford and St. David. Well points are an easy and inexpensive way to evaluate shallow ground water. Locations were selected to provide ground water information to complement streamflow measurements.

Analysis of Floodplain Well Data

Floodplain well data analysis determined: 1) depth to groundwater within the riparian zone; 2) seasonal variations in riparian zone groundwater elevations; and 3) correlations (if any) between riparian zone groundwater elevations and streamflow. In addition, the analysis of data from selected wells in the floodplain aquifer determined the trends in groundwater elevations and if changes in these elevations corresponded to changes in either mean monthly flow or base flows (defined as the 90-day annual low flow).

Water Sources Inventory

To date, 28 wells have been located, inventoried and mapped within the EIS area (see Appendix 11), two of which are unusable. The Bureau of Reclamation installed two wells for groundwater monitoring purposes. Eight wells are now usable and the rest could be put into operation with the installation of pumping equipment, a power source and/or some maintenance. Ten of the wells supply water for irrigation; one for an industrial operation; and four for domestic use. The rest were used for livestock watering. Most of the irrigation equipment is still in place. In measurements of depth-to-water, the depth ranged between 12 to 35 feet. These measurements include several of the irrigation wells.

The eight springs and three ponds have also been inventoried and mapped. Those sources are described earlier in this section.

Since the first acquisition of land in the EIS area, additional lands have been obtained and included within the EIS area. Water sources on these additional lands still need to be inventoried. The inventory phase will continue until all sources are located and mapped. A number of wells and stockponds exist on these recently obtained lands.

Water Quality

The quality of the surface water is good. Over the years, a number of entities have measured water quality in the river (U.S. Geological Survey, Arizona Department of Health Services, Arizona Game and Fish Department, Southeast Arizona Governments Organization, U.S. Fish and Wildlife Service, and Gray Triangle Action Group). This was usually in response to the many pollution spills in the upper watershed. Spills usually occur when intense rainstorms cause the holding ponds for sewage or mining wastes to overflow or breach. On occasion, the sewage and/or mining wastes may have been intentionally or accidentally released, usually to create more storage capacity.

As a general rule, high flows in the San Pedro River show the presence and movement of high levels of

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heavy metals in the water. Water samples taken in a one-time grab sample during a moderately high flow (August 20, 1987) show this relationship for the six most dangerous heavy metals (see Table 3-2). The table also shows the additional information of cubic feet per second (CFS) and pH. The flow is estimated in cubic feet per second. The Maximum Contaminant Level water quality standard is the safe drinking water standard, as established by the State of Arizona.

TABLE 3-2
Water Quality Analysis
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Sample Type	Above Green Brush	Lewis Spring Bridge	Charleston Bridge	Fairbank Bridge	Standard (Maximum Contaminant Level)
Flow	35.000	38.000	55.000	75.000	
pH	7.600	7.900	8.000	8.000	
Cu	.262	.260	.090	ND	0.500 Mg/L
Cd	0.320	ND	ND	ND	.010 Mg/L
Pb	.400	.141	.150	ND	.050 Mg/L
Zn	1.880	ND	ND	.110	5.000 Mg/L
Fe	4.100	.301	.600	13.000	.300 Mg/L
Hg	ND	ND	ND	ND	.002 Mg/L

Source: Safford District Files
ND - Not detected pH - Amount of the hydrogen ion in solution. Refers to the acid or alkalinity of a solution. Less than 7.0 indicates the solution is acidic, more than 7.0 indicates the solution is alkaline. Water is neutral at 7.0 pH.
Cu - Copper; Cd - Cadmium; Pb - Lead; Zn - Zinc; Fe - Iron; Hg - Mercury

Table Summary

- Copper exceeded the standard of 0.050 Mg/L from Hereford to Fairbank by a factor of 5.
- Cadmium exceeded the standard of 0.010 Mg/L above Greenbrush Draw by a factor of 3.
- Lead exceeded the standard of 0.050 Mg/L from Hereford to Fairbank by a factor of 8.
- Iron exceeded the standard of 0.300 Mg/L from Hereford to Fairbank. This excess ranged up to 43 times the established standard at the Fairbank Bridge.
- Zinc did not exceed the standard of 5.000 Mg/L.
- No Mercury was detected in the August measurement.

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Data obtained during another measurement (September 23, 1986) was well below the Maximum Contaminant Level standards for all heavy metals, except Mercury. Mercury was detected at only one site at 0.004 Mg/L. The 1986 analysis was for one day following a high intensity storm.

Water Rights

The Huachuca Audubon Society submitted an "Application for Permit to Appropriate Surface Water" to the Arizona Department of Water Resources in August 1985 to get an instream-flow water right. The requested water right is for the segment of the San Pedro River from Hereford to Benson. After BLM took ownership of the lands, the instream-flow water right was reassigned to the BLM. The application is under consideration by the Department of Water Resources. The application requested a quantity of flow for wildlife (including fisheries and riparian habitat maintenance) and recreation use (including aesthetics).

The San Pedro Watershed is now undergoing water rights adjudication proceedings under the direction of the courts and with guidance from the Department of Water Resources. These proceedings will consider all submitted water claims and determine the apportionment of the existing water resources.

WILDLIFE

Terrestrial Habitat

A vegetation inventory using the Brown, Lowe and Pase (1979) classification system identified 21 different plant communities (see Vegetation portion of this chapter for these classifications). These 21 communities are combined into 12 plant communities (see Appendix 3) in the Wildlife section for the sake of simplicity.

The riparian communities (cottonwood-willow riparian, mesquite bosque and cienega) contain 228 species or 53 percent of the total terrestrial wildlife species. Less than five percent of the EIS area, however, classifies as riparian communities. These communities, therefore, are the most important since the number of species using them are greater than the number of species using the other communities. The terrestrial wildlife species in the riparian communities include 167 species of birds, 47 species of mammals and 14 species of herptiles.

The riparian inventory showed a good distribution of age classes and frequency of trees in the cottonwood-willow riparian association in the area around Hereford. As a general rule, going north (downstream) leads to a poorer distribution of age classes and frequency of trees in the cottonwood-willow riparian association. Inventory data also reveals the age class distribution leans more toward the mature age classes than the seedling and young age classes.

The uplands consist of six plant communities. About 200 species of wildlife use the uplands, including 136 species of birds, 37 species of mammals and 27 species of herptiles.

Refer to the Vegetation section for more information regarding vegetation classification as well as quantity and quality of these habitats.

Appendices 6-8 provide lists of species by plant community: Appendix 6, birds, Appendix 7 mammals and Appendix 8, herptiles.

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Terrestrial Wildlife

Wildlife inventories on the upper San Pedro River found 303 species of birds, 84 mammals, and 41 herptiles on or adjacent to the EIS area. These species are subdivided into the following classifications to demonstrate different management strategies by groups of animals.

Non-game

Non-game species include 267 species of birds, 64 species of mammals and 40 species of herptiles.

Game

Game species include 36 species of birds (32 of which are waterfowl), 20 species of mammals and one species of herptile.

Table 3-3 displays a partial list of representive game species showing the relationship of short-term and long-term trends, current populations and the maximum possible populations in the area (personal communication AGFD).

Threatened and Endangered Species (terrestrial)

These species are federally listed or special status species (federal candidates and state listed). Threatened and Endangered species are non-game species and have additional protection under state and federal statutes, as well as BLM Manual direction.

Wildlife inventories found 24 federal and/or state listed species as present or possible in the EIS area (see Table 3-4). Current inventories have not verified the existence of any federally listed Threatened and Endangered species other than those migrating through the area.

TABLE 3-3
Game Species

BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Species	Short Term Trend	Long Term Trend	Current Population	Maximum Population*
Mule Deer	Up	Stable	420	1,220
Javelina	Up	Up	730	1,500

Source: Safford District Files

* The maximum population is the maximum biological potential of the area to produce these species while implementing all necessary habitat improvements and proper management strategies.

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TABLE 3-4
Federal and State Listed and Proposed Species
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Species	Abundance	Presence	Status
Sanborn's Long-tongued Bat	Unknown	Possible	F-P
Greater Mastiff Bat	Unknown	Possible	S
Mexican Gray Wolf	Unknown	Possible	F-E
Swainson's Hawk	Common	Observed	S
Mississippi Kite	Rare	Observed	S
Gray Hawk	Common	Observed	S
Ferruginous Hawk	Uncommon	Observed	S
Bald Eagle	Rare	Observed	F-E
Peregrine Falcon	Rare	Observed	F-E
Black Hawk	Uncommon	Observed	S
Caracara	Accidental	Observed	S
Osprey	Rare	Observed	S
Black-bellied Whistling Duck	Uncommon	Observed	S
White-faced Ibis	Unknown	Possible	S
Yellow-billed Cuckoo	Uncommon	Observed	S
Elegant Trogon	Rare	Observed	S
Green Kingfisher	Rare	Observed	S
Thick-billed Kingbird	Accidental	Observed	S
Tropical Kingbird	Rare	Observed	S
Black-crowned Night Heron	Uncommon	Observed	S
Snowy Egret	Uncommon	Observed	S
Long-billed Curlew	Unknown	Possible	S
Northern Beardless Tyrannulet	Uncommon	Observed	S
Gila Monster	Common	Observed	S
Western Massasauga	Unknown	Possible	S
Mexican Garter Snake	Rare	Observed	S
Desert Kingsnake	Uncommon	Observed	S
Relict Leopard Frog	Unknown	Possible	S

Source: Safford District Files

S = Special Status Species
F-E = Federally Endangered
F-P = Federally proposed for listing

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Aquatic Habitat

The only portion of the San Pedro River classified as a perennial stream is from the Hereford area to the vicinity of the Charleston Hills. The rest of the river usually has only intermittent flows.

The quality of the aquatic habitat is directly proportional to the existing ground and surface water quality. Water quality along the perennial stretch of the river is considered good and, therefore, the quality of the existing habitat may also be considered good. Additional information on water quality is found in the water portion of this chapter and in Table 3-2.

Aquatic Wildlife

Native Fishes

Historically, 13 native species of fish were present in the Upper San Pedro River (see Table 3-5). Of those species, two remain in the streams, the longfin dace and desert sucker.

TABLE 3-5
Native Fishes
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Loach Minnow
Flannel-mouth Sucker
Roundtail Chub
Spikedace
Longfin Dace
Desert Sucker
Gila Topminnow
Sonoran Sucker
Razorback Sucker
Gila Chub
Colorado River Squawfish
Speckled Dace
Desert Pupfish

Source: Safford District Files

Non-native Fishes

Most of the fishes present in the Upper San Pedro River system are nonnative species. Fourteen species of non-native fishes (see Table 3-6) inhabit the Upper San Pedro River or its tributaries.

TABLE 3-6
Non-Native Fishes
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Common Carp
Rainbow Trout
Brook Bullhead
Green Sunfish
Mosquitoefish
Goldfish
Flathead Minnow
Yellow Bullhead
Channel Catfish
Bluegill
Largemouth Bass
Brook Trout
Threadfin Shad
Red Shinner

Source: Safford District Files

Threatened and Endangered Species (aquatic)

Five federally listed Threatened and Endangered Fishes were native to the Upper San Pedro River but have since been extirpated from the area. These species are the desert pupfish, Gila topminnow, spikedace, loach minnow, and the Colorado River squawfish.

VEGETATION

Vegetation Communities

The area's vegetation was mapped in 1987 by BLM resource specialists

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using the vegetation classification scheme of Brown, Lowe, and Pase (1979). The vegetation was specified to the third decimal point or the association phase of the system. A total of 21 different plant associations were identified, as well as three miscellaneous types. The miscellaneous types were: AG, meaning lands that had been cultivated but are now in federal ownership; PVT AG, agricultural lands in private ownership; and RESIDENTIAL, areas of private lands primarily used for housing. Approximately 82,000 acres were mapped to provide coverage for any future land acquisitions in the EIS area.

The associations delineated, with a brief description of major plant species present are:

143.123

Hilaria mutica-mixed scrub Association--usually found in swales, with fine textured soils, made up of primarily tobosa (Hilaria mutica) grass and mixed shrubs. Principal shrub species include mesquite (Prosopis juliflora), wolfberry (Lycium spp.), littleleaf sumac (Rhus microphylla), snakeweed (Gutierrezia sarothrae) and fourwing saltbush (Atriplex canescens). Other major grasses present are sacaton (Sporobolus wrightii) and vine mesquite (Panicum obtusum).

143.141

Sporobolus wrightii Association--grasses, with sacaton being the dominant grass, make up the major component of this association. This association occurs on fine textured soils on low terraces. Other major species present include mesquite, whitethorn (Acacia neovernicosa) and wolfberry.

143.142

Sporobolus wrightii-Prosopis juliflora Association--composed of a mixture of sacaton and mesquite. It occupies the fine textured soils of the lower terraces of the major drainages. Other major species present include whitethorn, wolfberry, tobosa and vine mesquite.

143.152

Mixed grass-Prosopis juliflora Association--characterized by mixed grasses, mainly the introduced grass species, Lehman lovegrass (Cragrostis lehmannia) and mesquite. Other species are burroweed (Aplopappus tenuisectus), snakeweed, sideoats grama (Bouteloua curtipendula) and black grama (Bouteloua eriopoda). This association is a disclimax grassland that historically had few shrubby species and is now supporting a mixed grass-shrub community. It is found on upland sites above the San Pedro River terraces.

143.155

Mixed grass-mixed scrub Association--found on shallow soils on mountains and low hills. This association is characterized by perennial grama grasses (Bouteloua spp.), cane beardgrass (Andropogon barbinoidis), bush muhly (Muhlenbergia porteri), other native grasses and mixed native shrubs, including spice bush (Aloysia wrightii), ocotillo (Fouquieria splendens) and whitethorn.

143.156

Mixed grass-mixed shrub Association--similar to 143.155, but with a mixture of whitethorn and mesquite as the principal shrubs. Spice bush is rarely found on the hills and mountains of this association.

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143.157

Mixed grass-Acacia neovernicosa Association--similar to both 143.155 and 143.156 but the principal shrub is whitethorn. This association occurs on shallow soils on low hills and mountains.

143.163

Aplopappus tenuisectus-Prosopis juliflora Association--a disclimax grassland found on moderately fine and fine textured upland soils. Historically, this was a perennial grassland with few shrubs. Principal species present are burroweed and mesquite, which together make up over 90 percent of the perennial plant composition.

143.164

Aplopappus tenuisectus-mixed scrub Association--similar to 143.163 except mesquite doesn't dominate as the principal tall shrub. Whitethorn is the major tall shrub. Other species present are snakeweed, desert zinnia (Zinnia pumila) and a few perennial grama grasses.

153.243

Prosopis juliflora-mixed scrub Association--composed of shrub-size mesquite intermixed primarily with tarbush (Flourensia cernua), desert zinnia and very few perennial grasses. This association is found on fine textured soils on high terraces.

153.261

Acacia greggii-mixed scrub Association--found on moderately deep soils derived from acidic parent materials. This association is composed primarily of catclaw (Acacia greggii), tarbush and whitethorn, with little or no perennial grass species.

153.215

Mixed Chihuahuan scrub Association--major shrubs are mesquite, whitethorn, tarbush, creosotebush (Larrea divaricata), desert zinnia and mariola (Parthenium incanum). Bush muhly is the major grass species present, but minor amounts of other native grasses may occur. Throughout the area the relative dominance of each species may vary. This plant community is found on limy terraces and ridges adjacent to the San Pedro River. Acreage is the largest of the associations mapped.

153.221

Acacia neovernicosa Association--primary plant species is whitethorn, although minor amounts of other species occur. Other shrubby plants present may be mariola, desert zinnia, snakeweed and tarbush, with minor amounts of grasses (principally bush muhly). This association occurs mainly on limy breaks above the San Pedro River valley.

153.272

Atriplex canescens Association--found on very limy high river terraces and composed of four-wing saltbush, mesquite, whitethorn and few grass species. Grass species include tobosa, bush muhly and plains bristlegrass (Setaria macrostachya).

153.213

Larrea divaricata mixed scrub Association--creosotebush (Larrea divaricata) is the major shrub present along with minor amounts of mesquite, whitethorn and desert zinnia. The major grass species are bush muhly and plains bristlegrass. This association grows primarily on deep, limy soils on low terraces and

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alluvial fans above the San Pedro River.

223.231

Prosopis juliflora Association--on the floodplains along the San Pedro River and large tributaries where soils are usually deep, and loam or sandy loam in texture. Mesquite is the major component of this association, known as a mesquite bosque. Mesquite trees in this association can form a closed canopy and few other species achieve dominance. Four-wing saltbush and wolfberry are two associated species. This association varies from large trees to small stands of trees less than 10 feet tall. Many of the trees are sprouts from the trunks of older, cut trees.

223.232

Prosopis juliflora-short tree Association--scattered small (less than 10 feet tall), mesquite trees dominate this association. Four-wing saltbush and wolfberry are the associated shrubs, and scattered grasses include tobosa or vine mesquite. This association grows on moderately fine and fine textured soils on low terraces and alluvial fans, mainly on the north end of the EIS area. The area has a scattered shrub appearance with bare ground among the shrubs and some grasses present in the small drainages.

223.211

Populus fremontii-Salix gooddingii Association--the cottonwood (Populus fremonti) and Gooding willow (Salix gooddingii), or broadleaf riparian, association occupies the bottom of the San Pedro River, maintained by the relatively permanent water source. This association is on stream banks and low terraces in coarse textured soils. The association is characterized by a gallery forest of cottonwood and Goodding willow. Other associated species are Arizona walnut (Juglans major), seep willow (Baccharis glutinosa) and bermuda grass (Cynodon dactylon). More than 2,000 acres of this association were mapped in the study area, but this acreage doesn't portray its true size. Mapping is on 1:24,000 scale photos and includes large areas of relatively bare streambed in the acreage figures.

233.210

Mixed narrowleaf scrub-Hymenoclea monogyra Association--occupies sandy, dry stream bottoms on tributaries of the San Pedro River. Principal species are: burrobrush (Hymnoclea monogyra), rubber rabbitbrush (Chrysothamnus nauseosus) and mesquite. Only small acreages of this association are mapped due to the mapping scale but it is quite common mixed with other stream bottom plant communities.

233.221

Tamarix chinensis Association--small areas on the north end of the EIS area and in areas that have traditionally been broadleaf riparian or mesquite bosque association. Salt cedar (Tamarix chinensis) is an introduced, noxious phreatophyte that has invaded much of Arizona's wetlands. This plant association only occurs on a few hundred acres of the EIS area. It occurs, on fine textured bottom land soils, as a monotype with few other plants associated with it.

243.321

Juncus spp.-Carex spp. Association--rushes (Juncus spp.), sedges (Carex spp.), cattails (Typha spp.) and saltgrass (Distichlis stricta).

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Associated species are mesquite, sacaton, tobosa grass and Goodding willow. This association occurs on the north end of the EIS area, west of the San Pedro River, in one of the few surviving cienegas. Several springs maintain a marsh of several hundred acres.

Ecological Condition

Range condition (expressed as excellent, good, fair or poor) reflects the current vegetation composition of the rangeland in relation to the potential climax plant community. The potential climax plant community is grouped by soils and called a range site. The Soil Conservation Service (SCS) prepares a range site guide for each soil type by showing the potential climax plant community for each site. The EIS area has not been formally inventoried, but BLM has made estimates of rangeland conditions. BLM surveyed the riparian community (Brown, Lowe and Pase number 223.211) along the San Pedro River in 1986. The SCS soil survey identified a total of 12 range sites. A discussion of the relative condition of each site follows:

Clay Loam Upland--characterized by the Mixed Grass-Prosopis juliflora Association (Brown, Lowe and Pase Number 143.152) and in poor or fair condition. The site should be a grassland with a few shrubs in evidence. The presence of Lehman lovegrass further contributes to the poor rating since it is an introduced species and is given no worth using SCS guidelines in determining the condition.

Clay Bottom--typical vegetation is Sporobolus wrightii Association (143.141) and is in good to excellent condition. The mesquite present on this site in places would lower the rating since this is primarily a bottomland grassland site.

Deep Sandy Loam--mesquite bosque or Prosopis juliflora Association is the typical vegetation on this site. It is in poor to fair condition due to the large quantity of mesquite. This range site is in process of revision by SCS and will be redescribed as a woodland site which will raise its ecological condition rating.

Granitic Hills--mixed Grass-Mixed Shrub Association is the most common vegetation community and is usually in high-poor or low-fair condition. This site is a disclimax grassland--probably in grassland before the coming of Europeans to the area. The site has been invaded by shrubs and the condition will not change in either direction very quickly.

Limy Slopes--characterized by either a Mixed Chihuahuan scrub Association or a Larrea divaricata-mixed scrub Association, usually in high-fair to low-good condition. The only plants that occur are extremely tolerant to drought and large quantities of calcium carbonate (lime) in the soil profile. The site doesn't respond well to management practices and will remain in its present condition for many years.

Limy Upland--similar to and contains the same vegetation communities as the Limy Slopes site. However, due to its position on the landscape and the soil characteristics, its potential for grass production is lower than the Limy Slopes site. This site is in high-good to low-excellent

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condition and will remain so regardless of management practices applied.

Loamy Upland--various vegetation communities found are: Sporobolus wrightii-Prosopis juliflora Association, Mixed grass-Prosopis juliflora Association, Aplopappus tenuisectus-Prosopis juliflora Association, and Larrea divaricata-mixed scrub Association. The condition of the range site varies from poor in the Aplopappus tenuisectus-Prosopis juliflora and Larrea divaricata Associations to fair in the Mixed grass-Prosopis juliflora Association to good to excellent in the Sporobolus wrightii-Prosopis juliflora Association. Condition on these sites will change slowly, regardless of management practices.

Sandy Upland--mesquite bosque (Prosopis juliflora Association) is the primary plant community and generally in fair to good condition. Sites with a good understory of perennial grasses are in good condition. The description of this site should probably be a woodland site and not a range site since trees are a major component in the potential plant community.

Shallow Upland--Mixed Grass-Mixed Scrub Association is its major plant community and is in fair to good condition depending on the relative mix of grasses to shrubs. Grasses should be 70 to 85 percent of the plant community in excellent condition. Site rating could change fairly rapidly through the use of fire as a management tool to reduce the mixed scrub species.

Sandy Loam Bottom--Mixed Chihuahuan Scrub Association (the major vegetation type) is in poor condition because shrubby species have taken over a site that should be primarily a grass type. An upward change in the condition of this site would be slow with the application of any management practices.

Sandy Loam Upland--dominated by three major plant communities: Mixed Chihuahuan Scrub, Mixed Grass-Prosopis juliflora and the Aplopappus tenuisectus-Proposis juliflora Association in poor condition. The site should be dominated by mixed perennial grasses with few shrubs; the opposite is the case. Any change in the condition of this site will be slow with or without any management practices.

Volcanic Hills--Mixed Grass-Mixed Scrub Association (the principal vegetation type) is in fair to good condition depending on the amount of perennial grasses present. This site should be composed of nearly all grass species with few shrubs. Prescribed or natural fire could change this site to a higher condition class by reducing the shrubby species composition. Without fire, change will be slow.

The riparian vegetation was mapped as two vegetation communities: Populus fremontii-Salix gooddingii (cottonwood-Goodding willow) and Tamarix chinensis (salt cedar) Associations. These are not range sites and not evaluated as such. BLM did a riparian inventory of the main San Pedro River corridor in 1986 to assess the characteristics and general health of the riparian vegetation.

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The southern two-thirds of the corridor consists of a cottonwood-Goodding willow community in good health. A good distribution of all age classes is present, including seedlings. Some Arizona walnut and velvet ash are also present along with good herbaceous ground cover such as bermuda grass, sacaton and annual forbs and grasses.

From Fairbank north to the northern edge of the EIS area, the quality of the riparian community declines. Very few seedlings and young cottonwoods or willows are present. Most of the riparian species present are mature or decadent cottonwoods and willows. From the ghost town of Contention north, several colonies of salt cedar are present. This imported invading plant species is indicative of poor health of a natural, native riparian ecosystem.

Threatened and Endangered Species

There are no Threatened and Endangered plant species known to exist in the EIS area.

SOILS

The Soil Conservation Service (SCS), on contract to BLM, completed a soils inventory (standard SCS Third Order Survey) in 1986-87. The soil mapping is in soil associations, complexes and as single soil series. A total of 49 mapping units, made up of 27 different soil series, were delineated on 1:24,000 scale aerial photos. A summary of soil characteristics of the San Pedro area is in Table 3-7.

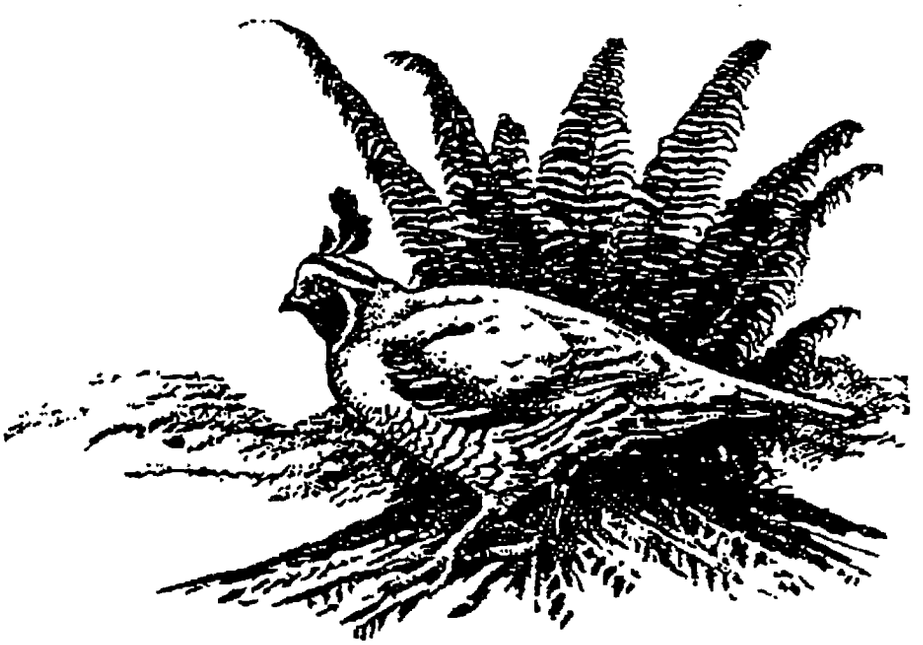

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TABLE 3-7
Summary of Soil Characteristics of the San Pedro Area
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Soil Name	Surface Texture Abbrev.	Ecological Site Name	Location on Landscape	Brown, Lowe and Pase Vegetation Community
Blakeney	SL	Limy Upland	Alluvial Fans	153.215
Bodecker	VGSL	SL Bottom	Alluvial Fans	153.215
Chiricahua	GSL	Granitic Hills	Granitic Mountains	143.156
Courtland	SL	SL Upland	Fan Terraces	153.215
Diaspar	LS	SL Upland	Alluvial Fans	143.163
Douro	GSL	Loamy Upland	Fan Terraces	153.213
Durazo	LS	Sandy Upland	Low Stream Terrace	223.231
Forrest	CL	CL Upland	Valley Plains	143.152
Forrest	SL	Loamy Upland	Valley Plains	143.52
Gadwell	GSL	SL Upland	Fan Terraces	143.163
Hooks	SICL	Clay Bottom	Flood Plains	143.141
Karro	Loam	Limy Slopes	Limy Fan Terraces	153.215
Kee	VGSL	SL Upland	Fan Terraces	143.152
Kee	GSL	SL Upland	Fan Terraces	143.152
Kimbrough	VGL	Limy Slopes	Limy Fan Terraces	143.155
Kinco	SL	Limy Slopes	Sloping Terraces	153.215
Lalande	SIL	Limy Upland	Limy Fan Terraces	153.215
Lemitar	VGSL	Volcanic Hills	Volcanic Mountains	143.156
Mabray	GSL	Limy Slopes	Limestone Hills	143.155
McAllister	LOAM	Loamy Upland	Level Fan Terraces	143.163
Monterosa	VGL	Limy Slopes	Level Fan Terraces	153.215
Perilla	SL	Deep Sandy Loam	Stream Terraces	224.521
Pomerene	GSL	Shallow Upland	Granitic Mountains	143.156
Riggs	SIC	Clay Bottom	Flood Plains	143.141
Sharvana	CL	Limy Upland	Fan Terraces	153.215
Stronghold	GFSL	Limy Upland	Fan Terraces	153.215
Tierranegra	GCSL	Loamy Upland	Fan Terraces	143.142
Tombstone	GFSL	Limy Upland	Fan Terraces	153.215
UBIK	SL	SL Upland	Flood Plains	143.142
UBIK	LOAM	Loamy Upland	Alluvial Fans	143.142

Source: USDA Soil Conservation Service, 1986. Unpublished soil survey.

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FIRE PROGRAM

The Safford District is now operating under the policies as mandated in Departmental Manual, Wildland Fire Control and Management, Part 910, Chapter 1.1, 1.2, 1.3, and 1.4 and Section 9210.06 Fire Management of the Bureau Manual.

Wildland fires (whether on BLM lands or adjacent lands) that threaten life, improvements, or the natural resources and facilities under the Bureau's jurisdiction, are emergencies. Their suppression is given priority over other Bureau programs. The Safford District is now operating under two categories of suppression action:

1. Suppression - Initial attack action is required to contain all fires at the smallest acreage and at the least cost. Initial attack action will vary with the conditions at the time of the fire start.

   If fire escapes initial attack, BLM prepares an Escaped Fire Situation Analysis (EFSA). This determines the most appropriate suppression strategy based on safety, cost efficiency and effectiveness of the fire suppression resources. Value at risk of the natural resources being threatened is also a consideration in the determination type and extent of suppression action.

2. Monitor - Generally fires of short duration contained within natural or man-made barriers. Surveillance is the most appropriate response.

In case of multiple fires, BLM gives priority to fires threatening areas of higher values.

All reported fires are checked by air reconnaissance or by ground transportation. A fire in an area with a history of erratic fire behavior, high concentration of fuels, dangerous terrain or probability of threat to life or property will have a resource advisor immediately assigned. Input from the resource advisors is standard operating procedure for most fires in the Safford District. Their active participation in wildfire management helps to coordinate both fire and resource management objectives.

Prescribed fires, including all ignition sources, may be used to achieve resource management objectives as defined in prescribed fire management plans. The Safford District is now working on an environmental analysis that will cover proposed prescribed fires by fuel types. BLM develops a prescribed burn plan for each fuel type. Detailed maps showing the proposed burn area, buffer zones and contingency plans will be available for each individual prescribed burn. When completed, the District will have the flexibility of using a natural start for a prescribed fire. Qualified personnel will attend all prescribed fires in the District under a written prescription (prescribed fire plan). Prescribed fires are monitored to assure they remain within prescription.

Areas of Special Suppression Consideration were identified and delineated on the Safford District dispatch map. Any wildfires on or within one mile of these areas will receive full and immediate suppression.

Pending completion of the San Pedro Management Plan/EIS and associated land use plans, all fires in the San Pedro EIS area will receive full and immediate suppression.

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MINERALS

The San Pedro EIS area has one contract for removal of material from public lands. Sierra Ready Mix runs a crushing operation in a major wash east of the riparian area. At the time of acquisition there was a second operation run by Young Block just south of Highway 90. The Young Block operation left in March 1988.

In fiscal year 1987, Young Block removed 40,215 cubic yards of processed material and Sierra Ready Mix removed 120,000 tons of bankrun material for processing. The Young Block material was predominantly used to manufacture concrete block and the Sierra Ready Mix material to produce asphalt and concrete.

The Sierra Ready Mix contract expires on February 9, 1989.

CULTURAL RESOURCES

Introduction

The cultural resources of the management area represent a diverse array of site types, cultures and time periods. The human occupation of the area began about 11,200 years ago. Many sites have exceptionally high scientific and/or public values with some values at the international level of importance. The EIS area provides a unique opportunity for the scientific study, public interpretation and conservation of the full array of cultural resources found in southeast Arizona.

About 150 recorded cultural resource properties are in the EIS area. An inventory of the entire property is needed to identify and manage the full array of cultural resources.

Site and inventory data are on file at the Safford District Office. Sensitive site-specific information on archaeological resources is, however, classified and excluded from the Freedom of Information Act, and will be available only to qualified persons with legitimate research interests.

Historical Contexts

Descriptions and evaluations of the cultural resources of the San Pedro EIS area are in the framework of their historical context. A historic context is an organizational format that groups information about related historic properties based on a theme, geographical limits and chronological period. A simple historic context describes one or more aspects of the historical development of an area and identifies the significant patterns that individual historic properties represent. A set of historic contexts is a comprehensive summary of all aspects of the history of the area.

The historic context is the cornerstone of the planning process. The goal of cultural resource planning is to identify, evaluate, and manage the full range of properties representing each historic context, rather than only one or two types of properties. Identification activities are organized to assure that research and survey activities include properties representing all aspects of the historic context. Evaluation uses the historic context as a framework within which to apply the evaluation criteria to specific properties or property types. Major decisions about identifying, evaluating and managing cultural resources are most reliably made in the context of other related properties (Department of the Interior, 1983).

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The following discussions include a synthesis of the EIS area's cultural history and previous research. A more detailed summary is in the San Pedro acquisition Environmental Assessment (U.S. Department of Interior Bureau of Land Management 1986). A broader treatment on southeast Arizona, including discussions on management objectives, is in the southeast Arizona Class I inventory report (Bronitsky and Merritt 1986). Changing land use and the environmental effects are thoroughly covered in Rogers 1965 and summarized in Wilkin and Galante 1987. These publications contain excellent bibliographies.

Description of Specific Historical Contexts

The Clovis Hunters--11,200 Years Ago to about 8,000 Years Ago

Theme. Big game hunting and lifeways of the first Americans.

Previous Research. Byron Cummings visited the area in 1928(?) and 1931. In 1931 he investigated a mammoth south of Hereford. The Gila Pueblo Foundation conducted surveys in 1929-1938. Dr. Emil W. Haury conducted University of Arizona field seminars from 1937 to the 1970's. Dr. Haury excavated the Lehner site in 1955 and 1956. Dr. C. Vance Haynes conducted the Murray Springs Project from 1966-1971, and excavated the Escapule mammoth in 1967 (on state owned land near the EIS area). Dr. Haynes did further excavations at the Lehner site in 1974 and 1975. Dr. Haynes and Bruce Huckell test excavated a mammoth in 1987 and 1988 at the Horsethief Draw Site.

Processes and Patterns. The Clovis hunters had a mobile subsistance pattern based on following herds of now extinct mammals such as mammoth, horse, camel, bison and tapir. They also ate small game and probably some plant foods.

Important Events. Clovis hunters may have been the first Americans, as their sites are the oldest firmly dated sites in the New World (ca. 11,200 BP - before present).

Property Types. There are few known types due to age, poor preservation if exposed, mobility of Clovis man (resulting in limited material remains), burying of sites by post glacial and recent deposition, and recent erosion of sites. There are four known and projected site types: kill sites, butchering sites, camp sites, and a combination of these types. The physical remains of the first three site types include the following: kill sites - bones of animals and Clovis projectile points; butchering sites - bones of animals, chipped stone knives and scraping tools, and possibly projectile points; and camp sites - fire hearths, knives and scraping tools, waste flakes, bones of animals and, possibly cores and projectile points.

The Murray Springs site contains Clovis kill sites, butchering sites, and a camp site. It also has an Archaic component and has yielded significant data on the pre-Clovis animals and environment. The Lehner Site contains kill sites, butchering sites, and is believed to have an undiscovered camp.

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The Horsethief Draw Site is presently being excavated and has the bones of a single mammoth in a Clovis age deposit. No cultural artifacts or features have been found.

Locational Patterns. Sites are in or near wash banks of San Pedro tributary streams. Predicted locational patterns include additional wash banks on other tributary streams as well as the banks of the San Pedro River.

Condition, Sources of Deterioration, and Sensitivity. Overall, sites are in good condition due to protection by deposition. Some sites may have been destroyed by erosion and weathering after being exposed. Impacts have resulted from erosion, weathering, rodent disturbance, and natural mixing of deposits.

All sites are highly sensitive to human disturbance (such as construction) due to their poor visibility. In addition, erosion and weathering can disturb the integrity of the site (the artifact-killed prey association). Eroding channels of washes are the most sensitive areas.

Values. All known sites have high scientific (research) values on an international scale. High public use values occur at select sites. The EIS area contains more known Clovis sites than any other area in the new world. The area has the greatest potential of any area for yielding important information on the Clovis Culture. The Murray Springs and Lehner Sites have yielded important information and has high potential for more. No cultural resource data has been found in the Horsethief Draw Mammoth Site to date, but it has the potential. The EIS area has a high potential to contain evidence of preand post-Clovis occupations. Such evidence is totally lacking in southern Arizona.

These sites also have public use values as potential interpretive sites. The Murray Springs Site has exceptionally high public use values due to the abundance and diversity of the excavated artifacts, bones, and features, and the visible stratigraphy. The Lehner Site has nearly equal use values. Any interpretation of the Murray Springs Site could include the Escapule Site.

National Register of Historic Places. The Lehner Site is a National Historic Landmark. The Murray Springs Site and qualifies for nomination to the National Register of Historic Places for its yielding information important in American prehistory. It is a high priority for nomination to the National Register.

Existing and Potential Uses. The Horsethief Draw Mammoth Site is being excavated at present and this use will continue. It could be assigned to public use upon completion of excavation. The Murray Springs, and Lehner Sites are being managed for potential public and scientific use.

Results of Previous Management Actions. There is high public interest in the Murray Springs Site and the Lehner Site (recently donated to BLM). This has resulted in their being recognized as priority sites for

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protection and development as public exhibits in place.

Commitments and Agreements. Arizona State Parks is considering the Lehner Site as a potential addition to the state parks system. If this were to occur, the site would continue to be public land but cooperatively managed by BLM and Arizona State Parks.

The Cochise Culture--8,000 BP to AD 1

Theme. Archaic hunting and gathering.

Previous Research. The Gila Pueblo Foundation conducted inventories throughout the vicinity from 1929-1938. Their work in the San Pedro EIS area occurred from 1936 to 1938. They recorded 14 sites in the EIS area. The purpose of their research on the upper San Pedro was to locate and excavate Cochise sites. Dr. Emil W. Haury conducted University of Arizona Archaeology Seminar Field Trips in the area from 1937 or 1938 to the mid-1970's. They visited sites discovered by Gila Pueblo and recorded seven sites. They also collected or excavated eroded sites (Cattanach 1966). The most intensive and extensive inventory in the EIS area was the Central Arizona Project Charleston Dam and Reservoir Survey conducted in 1968 by the Arizona State Museum. They recorded 126 sites, including Cochise sites. The area from three miles south of Hereford to four miles north of Charleston was partially inventoried. In 1968 the Arizona State Museum conducted a survey for the Central Arizona Project Tucson Aqueduct, recording one Cochise site in the EIS area.

Processes and Patterns. The Cochise Culture people represented the southeastern Arizona manifestation of the Western Archaic or Desert Culture tradition. The Archaic people lived by gathering wild plant foods and hunting small and medium-sized game. This subsistance strategy represented an adaptation to the drier climate that followed the last Ice Age. They lived in more than one location thoughout the year as they sought the areas containing plants and animals ready to harvest. Until late in their long occupation of the area they lived in temporary brush or skin covered shelters. Later they lived in shallow pit structures and may have started to practice limited corn agriculture. They used baskets instead of ceramic vessels and ground their plant food with grinding stones (manos and metates) and mortars and pestles. They hunted with spears and used chipped stone knives and scraping tools to obtain and process some foods.

Important Events. The most important single event during the Cochise Culture's long occupation was the acquisition of an agricultural technology - they began to grow corn in about 300 B.C. The transition of the area from an economy based solely on wild foods to one also based on the growing of plants was to dramatically change the southwestern lifestyle forever. This period is best represented on the upper San Pedro River.

Property Types. The known and projected site types are: artifact scatters (stone tools);

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fire hearths or roasting pits; artifact scatters with hearths or roasting pits; and pit structures; pit structures with artifacts and/or fire features. Additional data could group these site types into two classes--base camps and work sites. Rock art is an additional site type projected to occur.

The EIS area has many Cochise sites, mostly recorded by the Charleston Dam survey. Most of these are artifact scatters with hearths. Most of the remaining sites are artifact scatters. The EIS area contains the type site for the San Pedro Stage of the Cochise Culture - AZ EE:8:1 (ASM) (the Fairbank Site). Three other highly significant San Pedro Stage sites are in the EIS area - AZ EE:8:5 (ASM), AZ EE:8:7 (ASM), and AZ EE:8:11 (ASM). These were either excavated or collected by Gila Pueblo or the University of Arizona.

Locational Patterns. All known Cochise sites are in one of two settings: on terrace tops immediately adjacent to the San Pedro River floodplain or on eroded surfaces immediately adjacent to side washes (large primary tributaries of the San Pedro). The main concentration of known sites is along large washes on the west side of the river south of Charleston.

Predicted Locational Patterns. Sites are also expected to occur along small washes and on upland areas between washes. They are not expected to be visible except in eroded areas and in wash banks where the wash has cut into and exposed sites.

Condition, Sources of Deterioration and Sensitivity. The majority of sites are badly eroded. This has transported artifacts, disturbed and destroyed features, and mixed remains of various ages. Deposition has covered sites, making discovery difficult. Cattle trampling has broken and moved artifacts and accelerated erosion. Overall, sites are in fair condition.

Sources of deterioration include erosion, deposition, cattle trampling, off-road vehicle (ORV) travel, collecting, and construction (such as roads).

Cochise sites are highly vulnerable to disturbance from erosion, trampling, ORV use and construction involving earth moving. Exposure caused by erosion greatly increases sensitivity. Exposed remains are easily moved and destroyed. Buried remains are easily destroyed by construction due to lack of visible surface remains. Channel cutting can quickly destroy buried sites. The most sensitive area is the west side of the river south of Charleston along tributary washes.

Values. The majority of sites are important for their scientific values. The high number of late Cochise sites makes the EIS area a valuable source of data for the study of past adaptations to an arid environment. The poorly understood transition to an agriculture and sedentary lifestyle could also be studied here. These are priority research objectives throughout western North America. A few known Cochise sites also have public use values as potential interpretive sites, although

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these values do not appear high (site AZ EE:8:1, EE:8:5, EE:8:7, EE:8:11 (all ASM)).

National Register of Historic Places. Many of the Cochise sites with integrity would quality for nomination to the National Register for their scientific values. AZ EE:8:1 (ASM) should be eligible as a type site. Priority sites for nomination to the National Register are AZ EE:8:1 (ASM) - the Fairbank Site, AZ EE:8:5 (ASM), AZ EE:8:7 (ASM), and AZ EE:8:11 (ASM). All sites could be nominated together as a multiple property nomination.

Existing and Potential Uses. One archaeological research project is presently being conducted. Known sites with high potential for future scientific study or public uses are listed above.

The Mogollon, Hohokam and Salado Occupation—AD 1 to 1450

Theme. Prehistoric Resource Utilization and Agriculture.

Previous Research. Adolph Bandelier explored the Southwest, including the upper San Pedro River Valley, for the Archaeological Institute of America in 1883 and 1884. He reported at least one site of this period near Contention City in 1884. Frank Russell of the Bureau of American Ethnology, Smithsonian Institution, traveled in the Southwest observing ruins and making collections in 1890. He may have passed through the EIS area. Carl Sauer and Donald Brand of the University of California, Berkley, conducted a reconnaissance survey of the Southwest in 1929 and recorded four sites in the EIS area. The Gila Pueblo Foundation recorded ceramic period sites in the EIS area on its Eastern Range of the Red-on-buff Culture inventory in 1929 and 1930. University of Arizona Archaeology Seminar Field Trips, led by Dr. Emil Haury from 1937 to the 1970's, visited known sites and took collections. The Fairbank Depot Site AZ EE:8:3 (ASM) was a "Hohokam" site excavated by this class. Most of the recorded sites of this historical context are from the Charleston Dam and Reservoir Survey conducted by the Arizona State Museum in 1968. The Museum's 1969 inventory of the Tucson Aqueduct Project recorded three additional "Hohokam" sites.

Process and Patterns. The earliest evidence of occupation following the end of the established Cochise sequence dates to AD 700 - but ceramic producing people may have occupied the area as early as AD 1. These people had a culture that was a mixture of Hohokam and Mogollon. Floodplain and dryland agriculture were practiced along with gathering and hunting. This subsistence strategy was a refinement and expansion of that established by the Cochise to adapt to the arid environment. They were semisedentary, living in more than one place each year. They lived in shallow pit structures, made pottery, and had the bow and arrow. Later houses may have been surface structures of earth, adobe or stone.

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Important Events. Important events consisted of the development of agriculture as a major subsistence activity, the acquisition of a pottery making technology, the development of semi-permanent house types, the use of the bow and arrow, and the change to a more sedentary lifestyle.

Property Types. Known and predicted site types are: artifact scatters, features, artifact scatters with features, agricultural fields, and rock art. Another predicted site type, though tentative, is socio-cultural, such as shrines. Functional classification as either habitation sites or work sites can occur with more data for many of the artifact scatters and artifact scatters with features.

Locational Patterns. The locations of artifact scatters and artifact scatters with features (possible habitation sites) are on the San Pedro floodplain and on terrace tops immediately adjacent to the San Pedro or its major tributaries. Other artifact scatters and features (not appearing to be habitations) are found throughout all environmental zones. There are few agricultural fields and they consist of dryland rock pile fields on alluvial areas adjacent to major washes. Rock art occurs at or near the base of hill slopes.

Predicted Locational Patterns. In addition to the patterns reviewed above, the following are predicted. Many of the artifact scatters and artifact scatters with features not believed to be habitation sites may be habitations. If this is the case, habitation sites would be found on the terraces away from the San Pedro. Dry-land agricultural fields could occur anywhere on the property. Floodwater fields may occur on the San Pedro floodplain and in major side drainages but it is predicted that any present have been either buried by deposition or removed by erosion. Any fields found, however, may not be distinguishable from later Sobaipuri fields. Rock art could occur anywhere boulders or cliffs are available.

Condition, Sources of Deterioration and Sensitivity. Overall, the known sites are in fair condition. Erosion has disturbed many sites and is destroying such significant sites as the Fairbank Depot site. Floodplain deposits are believed to have buried many sites. Many habitation type sites were collected and dug for their artifacts. Cattle trampling has disturbed most sites and a sand and gravel extraction operation on the west side of the San Pedro River has destroyed at least parts of sites. Road and other construction has impacted a few known sites. Off-road vehicle travel has disturbed a few sites and has resulted in increased erosion, as has cattle trampling. Sites of this historic context are sensitive to land uses in a manner similar to that discussed for the Cochise sites. In addition, sites containing features, such as houses, are even more sensitive to disturbance. Possible habitation sites, rock art, and other small sites are more sensitive to construction and ORV use than larger more dispersed sites (artifact scatters).

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Values. The primary value identified for all known sites is scientific value. To varying degrees, all have the potential to yield important information.

Several sites have public use values for limited development as interpretive sites. Among these are a ruin south of Charleston (AZ EE:8:20 (BLM)), a site north of the Charleston Hills with associated rock art, (AZ EE:8:35 (ASM)), and the Boquillas Ruin northeast of Terrenate (AZ EE:8:4 (AMF)). The public use values of these sites appear to be relatively low.

National Register of Historic Places. All sites with integrity belonging to this historic context would qualify for nomination to the National Register as a multiple property nomination because of their potential to yield information important in prehistory.

Existing and Potential Uses. The existing use of all sites is interim protection. The primary potential use is scientific study. Ceramic and chronology studies are critical research priorities. An inventory of the EIS area is required to identify sites and determine appropriate uses under long-term management.

The Sobaipuri Occupation--About 1450 to 1769

Theme. Protohistoric agricultural communities.

Previous Research. The only known field research conducted on the Upper San Pedro Sobaipuri was the excavation of Gaybanipitea and the Presidio of Santa Cruz de Terrenate. Dr. Charles DiPeso of the Amerind Foundation excavated these sites in 1950 and 1951. DiPeso believed the Presidio was built on the Sobaipuri village of Quiburi. He concentrated his excavations on houses and other features identified as Sobaipuri. Three University of Arizona students are now conducting field research on the Sobaipuri. Limited research has occurred on the Sobaipuri or Upper Pima in other areas.

Processes and Patterns. The origin of the San Pedro Sobaipuri and the date of their first occupation of the area is unknown. They were there when Fray Marcos de Niza marched through in 1539. They reportedly abandoned the San Pedro for the last time shortly after 1780. They based their life on an agricultural subsistence strategy, living in villages overlooking the river. The Sobaipuri reportedly practiced extensive irrigation agriculture on the San Pedro floodplain. They may have lived part of the year in the small camps away from the river to be close to plant gathering or hunting areas. They were very important to the Spaniards for they served as a buffer against the Apache. This allowed the Spaniards to maintain a northern border at a great distance from their mission locations.

Important Events. The most important events involving the Sobaipuri were their battles with the Apache and their contacts with the Jesuit missionary Eusebio Kino from whom they received cattle and a variety of European crops.

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Property Types. The only type of site discovered to date are villages. Two predicted types are agricultural fields and burial sites. Temporary camps may be present.

Locational Patterns. All known villages are situated on terrace tops overlooking the San Pedro floodplain. They are concentrated on the west side of the river between Saint David and some point south of Fairbank.

Predicted Locational Patterns. Burial sites should be near the villages and rarely in villages. Agricultural fields were present on the floodplain of the San Pedro according to historic records. Buried remains (canals, ditches, other agricultural features, field houses, and farming tools) are predicted for the floodplain of the river and for the larger side drainage floodplains. Dryland fields may occur on the terrace tops.

Condition, Sources of Deterioration, and Sensitivity. Known sites are in fair condition. Erosion has been the main cause of impact. In addition to exposing remains to other impacts and destroying part or all remains of a few villages, erosion has likely removed entire agricultural fields on the floodplains. Deposition has buried houses, possibly entire villages, and has covered all fields on the floodplains. Cattle trampling and artifact collecting has had some impact. The shallow houses and features are very sensitive to erosion. Areas of high sensitivity are the terrace tops adjacent to the river.

Values. The primary value for all site types is scientific value. This time period is the biggest gap in the knowledge of southwestern prehistory and history. The San Pedro can contribute more than any known area to filling this gap, for the area contains more Sobaipuri sites of this period than any other area. Important research topics include Spanish contacts, Apache contacts, Sobaipuri movement, and Sobaipuri lifestyle.

The Sobaipuri sites have public values, for they may be of socio-cultural value to the Pima and Tohono O'odham living in southern Arizona today.

Several sites appear to have additional public use values. Specifically, Gaybanipitea has good opportunities for public interpretation and other sites have some public interpretation value.

National Register of Historic Places. All properties with integrity belonging to this historic context would qualify for nomination to the National Register as a multiple property nomination. They would quality because of their potential to yield important information and possibly for their association with important events (Spanish colonial efforts and Apache raiding) and persons (Kino).

Existing and Potential Uses. The village sites are now the subject of archaeological and historical studies. Potential uses include scientific research, and to a lesser extent, development as public exhibits in place.

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The Apache--About 1600 to 1886

Theme. Apache raiding, warfare and foraging.

Previous Research. No field research has occurred. Historians, archaeologists, and others have conducted limited library and archive research on Apache activities in the area. Several known Spanish historical journals contain information on the Apache.

Processes and Patterns. Research indicates that the Apache arrived in the southwest in about AD 1500. A nomadic people, they were reportedly in the Upper San Pedro area by AD 1640, subsisting on the gathering of wild plant foods and hunting. The Apache did limited farming in other areas. In this area they are best known for their raids and battles with the Sobaipuri, Spanish settlers and soldiers, Mexican ranchers, and early American settlers. Their houses were brush shelters sometimes covered with animal skins or dirt. They stayed in one place for only short time periods and had few possessions. Many of their possessions by the 1800s were of Anglo origin. Remains of their presence are difficult to find and identify today. The EIS area has no reported sites.

Important Events. The most important Apache events were their raids on the Sobaipuri and foreign intruders. This raiding was the major cause of abandonment of the area by the Sobaipuri, the prevention of permanent and expanded Spanish settlement, and the long delay in American settlement.

Property Types. Predicted site types are: temporary camps and rock art. A possible site type is shrines. Isolated artifacts and features (non-sites) will be very important.

Predicted Locational Patterns. It is predicted that visible and recognizable sites will be rare, with the majority east of the San Pedro River. They could be in any environmental setting. No villages are expected to occur in the EIS area.

Condition, Sources of Deterioration and Sensitivity. Possible sources of deterioration are erosion, weathering, deposition, and cattle trampling.

Values. Potential values are of two types: scientific and socio-cultural. Any scientific data that could be obtained from sites would be very important in reconstructing the poorly known activities and lifestyle of the early Apaches. Present day Apaches in southern Arizona and New Mexico may value early Apache sites for social, cultural, or heritage reasons.

Potential Uses. Sites could be the subject of scientific research.

The Spanish--1539 to 1820

Theme. Spanish exploration, religious and military activities, and ranching.

Previous Research. The only field research conducted in the EIS area was the excavation of the Spanish Presidio of Santa Cruz de Terrenate. The site was excavated by Charles DiPeso of the Amerind Foundation in 1950

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and 1951. Only part of the site was excavated and work focused on the structures Di Peso believed were the remains of the Sobaipuri village of Quiburi.

Much library and archival research has occurred on the Spanish occupation of the southwest, with some of the work being directed at the upper San Pedro area. Some of the research continues at present.

Important Processes, Events and People. Spanish presence in the Southwest was a process of exploration, mining, ranching, establishment of a mission system, and an attempt at establishing permanent settlements. The Spanish were the first Europeans to enter western North America. Both Fray Marcos de Niza in 1539 and Francisco Vazquez de Coronado in 1540 followed the San Pedro River in their explorations. The Jesuit priest Eusebio Francisco Kino visited the San Pedro in 1692 and stopped at Quiburi on a later trip in 1696. He left cattle and crop seed with the Sobaipuri. From 1705 to his death in 1711, Kino fought without success to get a mission established at Quiburi. Approval for construction of a presidio (fortified settlement) to protect ranchers from the Apache occurred in 1772. Construction began in 1775 or 1776 on the Presidio of Santa Cruz de Terrenate. It may have been on the site of Quiburi. Abandonment of the post, due to the continuous Apache attacks, occurred in 1780. This marked the end of Spain's attempt to maintain its northern frontier beyond Tucson.

Cattle ranching began in 1696 when Kino brought cattle to the Sobaipuri at Quiburi. Cattle numbers remained low until 1790-1811 when a few Spanish cattle barons raised many cattle.

Property Types. Known site types consist solely of a single presidio. A possible site type is visitas (square adobe houses built in Sobaipuri villages to house visiting Spanish priests). An adobe brick building at Gaybanipitea was interpreted by DiPeso as being a visita. Another possible site type is the Spanish ranch house. None have been reported but Spanish ranchers did run cattle on the area.

Locational Patterns. Military sites are in good defensive locations. Any ranching sites should be on or near the river or water sources. Visitas would be in Sobaipuri villages.

Condition, Sources of Deterioration and Sensitivity. The Presidio of Santa Cruz de Terrenate is in poor condition as a result of weathering. Excavation of the site and the lack of backfilling the excavated buildings has accelerated the weathering. Destruction of part of the chapel occurred when treasure hunters dug at the site. In addition, collectors have removed surface artifacts. The site is highly sensitive to weathering, collecting, and uncontrolled visitor use.

Values. The Presidio is the only one in the country: under federal management; still in a natural setting; and with ruins of a commander's quarters of that time period.

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The Presidio has high public values for interpretation. There are opportunities for development of the site as an exhibit in place. High scientific values are also present, as only a portion of the site has been excavated. The site could yield much information on the lifestyle of the Spanish soldiers and on Apache contacts. It should provide data to settle the question whether Quiburi is at this location. Additional data on the pre-historic occupation is also believed to be present.

National Register of Historic Places. The Presidio of Santa Cruz de Terrenate is on the National Register.

Existing and Potential Uses. The Presidio is being used for tours for special groups. Opportunities are high for development as a public exhibit in place. Historical research is being conducted and there are good opportunities for future excavation and other scientific research.

Results of Previous Management Actions. Deterioration of the Presidio has nearly ended through the construction of a cattle exclosure and completion of emergency stabilization of adobe walls.

Commitments and Agreements. Arizona State Parks is considering the presidio as a potential addition to the state parks system. If this were to occur, the property would continue to be public land but cooperatively managed by BLM and Arizona State Parks. BLM's commitment is to preserve the standing walls of the Presidio.

Mexican Ranching--1821 to 1853

Theme. Mexican ranching.

Previous Research. The only studies known are historical research on the general Mexican occupation of the Southwest and limited research on the land grants.

Important Processes Events and People. Two important events were the: establishment of two land grants and a sharp decline in ranching. The EIS area was part of large Spanish ranches. The two land grants in the EIS area were granted by the government of Mexico after Mexican independence.

A grant was issued in 1827 for the San Juan de las Boquillas y Nogales land grant. Captain Ignacio Elias Gonzalez and Nepomucino Felix paid the equivalent of $240 and received title in 1833. The first U.S. patent issued for the Boquillas grant property was to William Randolph Hearst and his mother in 1901. A grant was issued in 1827 to Rafael Elias Gonzales for the San Rafael del Valle land grant, with the title issued five years later. The Camou brothers received the first U.S. patent. Cornell Greene purchased the property in 1905. (See Appendix 9 for a list of owners).

Establishing the land grants was important because it allowed the large ranching operations of the Spanish settlers to continue into the Mexican and American periods. Cattle numbers, however, decreased until the 1880s.

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The decline of ranching (cattle numbers) mirrored the Mexican period decline in general. Apache raids prevented settlement and destroyed ranches. A reported 60,000 loose cattle roamed southeastern Arizona in 1851.

Property Types. There are no known Mexican sites in the EIS area. Predicted types are ranch houses and associated outbuildings and graves. A Mexican fort is reported to be in the EIS area.

Predicted Locational Patterns. Ranch houses are expected to occur in or immediately adjacent to the riparian zone.

Values. Mexican sites having integrity are expected to be important sources of scientific and historical information, as the Mexican lifestyle is poorly known.

American Ranching and Farming--1853 to 1988

Theme. American ranching and farming.

Previous Research. The major research and publication completed was a thesis prepared by J.J. Wagoner in 1949 on the history of ranching in southern Arizona. Several studies on environmental change have dealt with ranching and farming in the area (Rogers 1965, Wilkin and Galante 1987). The only known extensive field work was by Hastings and Turner while preparing their book "The Changing Mile".

Processes and Patterns. The history of ranching in the upper San Pedro was a process of increasing cattle and sheep numbers until 1891 and then decreasing numbers. Ranching was also a process of changing from many small operations to ranching dominated by a few large operations. These post-1891 patterns or trends have continued to the present.

The trend in farming was one of increasing farm numbers and sizes through time. While the railroads were being built, Chinese laborers established small farms near Fairbank . Mormon farms on home-steaded lands were near the north end of the EIS area and in the area between Lewis Springs and Mexico. Establishment occurred in the 1870s. Fields were recently cultivated south of Highway 90 under agricultural leases from Tenneco West.

Important Events and People. The reestablishment of controlled herds in the 1850s-1870s marked the beginning of cattle ranching as a major business in the area. The purchase of the land grants by Americans between 1880 and 1905 was the birth of the large ranches. Two of these ranchers were important men - William Randolph Hearst and Cornell Greene. Abandonment of most of the railroads caused Fairbank to become primarily a ranching town. Hereford became a ranching community when Greene built his house there. Acquisition of the grants and adjoining rangeland by the Boquillas Land and Cattle Company (1901 and 1912) marked the end of local ownership of the largest ranches. The settlement by Mormons and other early homesteaders was the start of a

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growing farm economy. Acquisition by BLM marks the end of ranching and farming as major businesses on the subject lands.

Property Types. Only a few site types have been identified: ranch headquarters (Boquillas), range improvements, ranch houses (the San Pedro Ranch House and outbuildings), agricultural fields, wells, ponds, dams and irrigation canals. A predicted site type is graves.

Locational Patterns. The ranches comprised the entire EIS area. The location of all known site types is on the San Pedro floodplain, except that a minority of the range improvements are on the adjacent terraces or in side drainages. Graves could be in any setting. Ponds, dams and canals would be along the San Pedro River.

Condition, Sources of Deterioration and Sensitivity. Overall, the sites are in good condition. The Boquillas Ranch headquarters is in excellent condition, although the original buildings may be gone. The San Pedro Ranch House is in good condition. The primary threats to the San Pedro Ranch House are fire (illegal alien camp), vandalism, and gradual weathering. The agricultural fields are gradually reverting back to natural vegetation.

The most sensitive site types are those with standing structures. They are highly vulnerable to construction, vandalism, weathering, and in some cases fire. The area of highest sensitivity is the San Pedro floodplain.

Values. All site types have scientific values. Ranch headquarters and houses have very high scientific values. They can provide data to address two major regional data gaps: pioneer lifestyles and the nature of early ranching, farming and homesteading.

The Boquillas Ranch Headquarters has exceptionally high public values. Its integrity is high and it provides opportunities to preserve and interpret a rare and important site type. Local and former residents consider the property to have socio-cultural value as an important part of their heritage. The San Pedro Ranch House has high public values as a potential interpretive site and the opportunities for public use are high. The historical significance of the property and its past residents is low in comparison to the Boquillas Ranch Headquarters.

National Register of Historic Places. All ranching sites with integrity would qualify for nomination to the National Register as a multiple property nomination for their research values and their association with important events and people. The Boquillas Ranch Headquarters meets the same criteria for nomination as an individual property. The San Pedro Ranch House may be eligible individually for its association with important events. The Boquillas Ranch Headquarters and San Pedro Ranch House are the top priority sites for listing.

Existing and Potential Uses. The Boquillas Ranch Headquarters served as a ranch headquarters until 1988. At that time it

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changed to a BLM residence and field maintenance headquarters. Potential uses include partial public use as an interpretive site (primarily the commissary), and continued use as a residence and maintenance center. The San Pedro Ranch House is being stabilized and security is being provided. Potential uses include public use as an environmental education center, an interpretive center, an office for the Friends of the San Pedro support group, and/or a temporary visitors center. The San Pedro Ranch House requires rehabilitation before public use.

Results of Previous Management Actions. Stabilization of the San Pedro Ranch House will preserve it for future public use while preserving scientific and other values.

The Processing of Gold and Silver Ore--1878 to the 1890s

Theme. Human use and occupation as it relates to mining.

Previous Research. Much historical research has been done on this subject. There are many books and articles on the ore mills and mill towns, especially Charleston. No archaeological studies are known of.

Important Processes and Events. Mineral related activities on the upper San Pedro River were the result of the discovery of silver near Tombstone in 1877. The lack of water near the mines for ore processing led to the construction of stamp mills along the San Pedro River, a minimum of six miles away. The large mills were: Gird Mill, Corbin Mill, Boston Mill (also called Empire Mill), Grand Central Mill, Contention Mill, and Sunset Mill (also called Head Center Mill and Bullionville). Smaller mills were the Fairbank, Hereford, and Clifford Mills. The Gird and Corbin Mills were among the largest stamp mills in the country and their machinery came all the way from Europe. A sawmill, parts of which came by sea and land from San Francisco, operated in the Huachuca Mountains to supply lumber to construct the mills. The mills operated for about ten years, until the Tombstone mines shut down in 1887 due to flooding.

Mining towns sprang up near several of the mills: Millville, Charleston, Contention City, and Emery City. Fairbank began as an important shipping and railroad town at a major junction of railroads connecting the mills, mines and towns. Hereford started near a small smelter and later (1904) became a ranching town on the large Green Cattle Company ranch. A local miner started Lewis Springs.

Property Types. The known site types are: mill sites, mill towns, houses, commercial business buildings, wells, cemeteries, and graves.

Locational Patterns. The known property types are on or near the San Pedro floodplain. Mill sites are at the base of terrace slopes adjacent to the river floodplain. Towns are on the floodplain or on low terraces next to the floodplain. Houses could be anywhere but would be expected to be near mill sites (such as the Brunckow Cabin).

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Wells are at town sites. Cemeteries and graves are on hilltops or other terraces at some distance from towns.

Predicted Locational Patterns. Graves could occur in any location.

Condition, Sources of Deterioration and Sensitivity. In general, the mining sites are in fair condition. Digging and collecting by relic hunters has significantly reduced scientific values at town sites. Graves have been opened and cemetery headstones and fences have been destroyed, stolen and moved (such as the Charleston Cemetery). Nearly all lumber has been removed from mills and buildings. Cattle trampling has impacted the standing walls of houses and other buildings. Erosion has destroyed many buildings, especially at Charleston where the San Pedro has changed course and increased in channel size. General weathering has worn down adobe buildings. Very few adobe buildings remain except at Charleston. The 1887 earthquake reportedly shook down buildings at Charleston, and street fighting exercises held there in World War II impacted the site.

The most sensitive feature types are adobe buildings (weathering and erosion) and towns (relic hunters). High sensitivity areas would be the town sites.

Values. All known mining sites have high scientific values, especially the town sites. Town sites could yield extensive information on every day life on the mining frontier. Studies on this are rare throughout southern Arizona. The mills could provide badly needed data on the technology of stamp mills. The towns, mills, cemeteries, and graves have high public values. There are opportunities for public interpretation at Charleston, Millville, and the two mills by Millville (Gird and Corbin). The towns, mills, cemeteries, and graves also have high socio-cultural values to the people formerly associated with the area.

National Register of Historic Places. All mining sites with integrity would quality for nomination to the National Register as a multiple property nomination for their association with important events and people and for their potential to yield information important in American history. Each of the towns and mill sites qualify for individual nominations.

Transportation and Commerce During the American Settlement--1853 to 1912

Theme. Transportation and commerce.

Previous Research. Limited research has occurred pertaining specifically to this historic context. David Myrick's books on railroads are excellent works on the history of railroads in the area. General research has been conducted on the Wells Fargo Stage system.

Processes and Patterns. Very few roads existed before to the 1870s. The extensive mining activity and, to a lesser extent, ranching led to establishing a network of roads and

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railroads. The Wells Fargo Company established stations at most of the towns and in other isolated locations. This transportation and freight system was a key factor in the American settlement of the region.

Many rail lines were built connecting the mines, mills, towns and the outside world. Each mill had its own spur line. Fairbank got its start as a railroad town at the major intersection of railroads. The construction of depots, often with a number of associated buildings and houses, occurred along each rail line. Towns and depots were water and fuel sites. Ore, cattle, supplies, mail and passengers were transported by train.

Important Events and People. Important events included the following: Establishment of Wells Fargo agencies in 1880 at Contention City, Charleston, Millville, Benson, and Tombstone, in 1883 at Fairbank, and in 1904 at Lewis Springs and Hereford; construction of railroads and freight roads; establishment of Fairbank as a railroad town in 1882; train robbery at Fairbank by the Billy Stiles-Burt Alvord gang in 1900 and the shoot-out with Sheriff Jeff Milton; and the closure of the Tombstone mines in 1887, marking the beginning of the end for most of the railroads, stage lines, and extensive commerce.

Property Types. Known property types are: roads, stage stations, railroad lines, railroad trestles, bridges, depots, railroad sidings, towns, commissaries, houses, railroad stations, and cemeteries.

Locational Patterns. Historic roads are in all environmental zones throughout the property. Stage stations are at towns and elsewhere on or adjacent to the San Pedro floodplain. Railroads are on the San Pedro and Babocomari River floodplains and on the terraces. Main lines ran north-south between Benson and Bisbee (through the San Pedro Valley), with east-west lines to Tombstone and Nogales. Spur lines ran to the mills and towns. In general, the primary lines follow rivers because of water and fuel supplies and terrain factors.

Predicted Locational Patterns. The Drew Stage Station is believed to be located about two miles north of Contention City, on or near the San Pedro floodplain on the east side of the river.

Condition, Sources of Deterioration and Sensitivity. The general condition of the sites is poor. Roads and abandoned railroad beds are highly eroded and overgrown and sometimes difficult to see. Stage stations have not been identified. Railroad trestles have been mostly destroyed by salvaging the timbers and by floods. Depots, houses, railroad stations and other buildings are mostly gone except a few intact cement foundations. The railroad masters house at Fairbank was destroyed by fire in 1987.

Highway construction destroyed about half the buildings at Fairbank. Fairbank is being impacted by present administrative use of the historic property. The presence of BLM personnel also protects the town. The Fairbank Cemetery has

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had headstones and fences destroyed, and graves have been opened. Weathering has destroyed grave markers.

The most sensitive property type is buildings constructed of wood. They are extremely sensitive to fire. Roads and railroad beds are sensitive to erosion. Previously inhabited stations, towns and other site types are sensitive to digging and collecting by relic hunters, construction, and rehabilitation for future use.

Values. All known sites have scientific values. Railroad towns (Fairbank) have very high scientific values. All site types can provide important information on transportation and commerce during this period. Some sites can yield information on the lifestyle of former occupants. This is an important data need in southeastern Arizona.

Several sites have public values. Fairbank, the railroad commissary at the Boquillas Ranch Headquarters, and the railroad tie building at the San Pedro House (temporary quarters for railroad workers) have high values for interpretation as exhibits in place. Other sites may also have public values.

National Register of Historic Places. All sites with integrity belonging to this historic context would qualify for nomination on the National Register as a multiple property nomination. Qualifying values include association with important events and people, and the potential to yield information important in Arizona history.

Most of the sites would also qualify as individual nominations. Fairbank is the top priority site for listing if individual sites are nominated.

Existing and Potential Uses. Many of the roads are no longer in use. All but one railroad line is abandoned. The Fairbank site is presently a temporary BLM administrative site. Potential uses include scientific study at all sites and public interpretation at select sites.

Results of Previous Management Actions. Fairbank is being protected by the presence of BLM facilities, although this use (storage) is causing some impact. Fairbank requires an evaluation of preservation needs. Interim stabilization of the mercantile store will result in the long term preservation of significant buildings.

U.S. Government and Military Activities--1846 to 1940

Theme. U.S. government and the military.

Previous Research. Limited research has occurred on the Mormom Battalion's march down the San Pedro, including some field studies. No known research is available on Civilian Conservation Corps activities in the EIS area or on army maneuvers at Charleston during World War II.

Important Events and People. The Mormon Battalion, infantry volunteers in the Army of the West, marched down the San Pedro River in 1846 enroute to California during the Mexican War. Led by Colonel Phillip St.

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George Cooke, they reached the San Pedro near Hereford and followed the river north to about Benson. While in the Charleston-Fairbank vicinity they engaged in the only action they had in the war. Wild cattle charged the Battalion in what has become known as the Battle of the Bulls.

The San Pedro was a crossroads for the army in its pursuit of Apache raiders until 1886. Fort Huachuca (adjacent to present day Sierra Vista) was established in 1887. The U.S. Army used Charleston to practice street fighting during World War II.

The Civilian Conservation Corps (CCC), administered by the Works Progress Administration, worked on conservation projects along the San Pedro in the 1930s. They used and may have built the northern most house and garage/shop at Fairbank. The nature of their work and the location of other sites in the EIS area are unknown.

Property Types. Known property types are: trails; battle sites (Battle of the Bulls); and CCC camps (Fairbank). Predicted site types are Army camps and CCC conservation features.

Locational Patterns. The Mormon Battalion trail is primarily on the San Pedro floodplain and on the nearby terraces (exact route unknown). The exact location of the Battle of the Bulls is unknown. The Fairbank CCC Camp is on the San Pedro floodplain. No predictions can be made on the locational settings of army camps and CCC conservation features.

Condition, Sources of Deterioration and Sensitivity. The Mormon Battalion trail is in poor condition and signs of it are visible in perhaps only one place. The CCC buildings at Fairbank are in good condition. They have deteriorated some due to general weathering and relic hunters have collected artifacts. These buildings are very sensitive to weathering, vandalism and adaptive use.

Values. All property types possess scientific values and public use values. Values are relatively low for the Mormon Battalion trail and the Battle of the Bulls site due to their poor integrity. Scientific values are moderate for the Fairbank CCC buildings and the public use values are also moderate. Limited interpretation for visitor use could be accomplished.

National Register of Historic Places. The Mormon Battalion trail, including the Battle of the Bulls site, may be eligible for nomination because of its association with important events and persons. The Fairbank CCC buildings may be eligible by themselves for their association with an important event or they may be eligible as part of the town of Fairbank.

Existing and Potential Uses. The Fairbank CCC Camp is part of the temporary BLM administrative site. The house is used to store equipment, the garage/shop is a fire cache, and the shed is used for horse feed. The potential uses include public interpretation as part of the interpretation of Fairbank.

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Results of Previous Management Actions. A preservation evaluation, completed in 1988, will lead to the stabilization and securing of the Fairbank CCC buildings.

PALEONTOLOGICAL

Dr. Everett H. Lindsay of the University of Arizona inventoried the EIS area for paleontological resources in 1986 and 1987. This inventory, conducted for BLM, consisted of visiting the 14 known sites and surveying high potential locations throughout the EIS area. The known sites were recorded and 22 new sites discovered and recorded. The majority of sites are of Pleistocene age (2 million - 10,000 years ago). The remaining sites date to the Pliocene (7-2 million years ago) and the Holocene ages (10,000 years ago to the present). Most of the fossils are mammals but turtles, snails and plants are also found in some of the deposits. Nine sites classified as Class I sites, containing or producing fossils of significant scientific interest.

The paleontological resources of the EIS area rank among the top two paleontological areas in Arizona. They rank in the top five for the late Cenozoic (approximately 1-5 million years ago) terrestrial deposits in North America. The EIS area ranks as the top area in the western hemisphere for paleontological sites associated with early man. This is because of the number of sites, the excellent chronological control of those sites, and the potential for additional sites. The fossils of the EIS area have a high potential for yielding important information on mammal evolution and intercontinental dispersal, the earliest humans to occupy North America, late Cenozoic geology and life, vegetational changes, and climatic changes.

Exposed fossils are in and near the river and wash channels. Many are consequently in poor to fair condition as a result of erosion and exposure. Fossils, located throughout the EIS area, are concentrated between Charleston and Highway 90.

SOCIAL

A social analysis (University of Arizona, 1985) has been completed. The initial part of this study, conducted prior to BLM's acquisition of the San Pedro EIS area, was updated in 1987. This report is available for review at the Safford District Office.

It is apparent from that analysis and subsequent discussions between BLM specialists and the public that the protection and enhancement of the riparian ecosystem and the preservation and study of significant cultural artifacts are most important to a majority of respondents. While the use of the area for recreational purposes was valued, control of that use was also important to them. Similarly, sand and gravel from the San Pedro is acknowledged to be important as an inexpensive and important source of material, yet a need to control the use of that resource is apparent. Off-road vehicle use and mining are deemed inappropriate by most of the respondents because they felt these activities would be harmful to the environment, disrupt traditional uses of the river and be unfair to all concerned.

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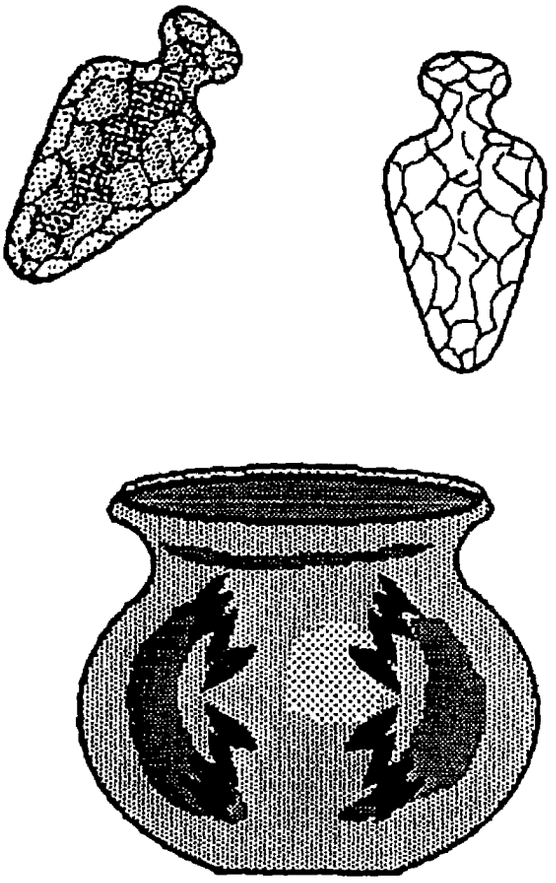
CHAPTER 4



CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter 4 analyzes the environmental consequences of implementing the alternatives, including the Preferred Alternative. The level of analysis for each resource depends on the degree of impact expected. The interdisciplinary team determined no measurable impacts would occur to topography, air quality or climate and they are not discussed further in this chapter.

BASIC ASSUMPTIONS

The impact analysis was based on the following assumptions.

1. Funding and personnel will be available to fully implement any alternative.

2. Those resources now receiving special protection will continue to receive that protection.

3. The definition of long-term is five years or more. All impacts are long-term unless otherwise noted.

4. Native American religious practices shall receive due consideration under the provisions of the American Indian Religious Freedom Act (P.L. 95-341).

5. BLM will write Environmental Assessments before implementing any activity plans or site-specific actions.

6. Ground and surface water will be adequate to maintain the river system (including the riparian and aquatic habitats) and all of the consumptive and nonconsumptive uses described in the alternatives for about 15 years.

7. Cultural resources will continue to deteriorate through natural forces, visitation and vandalism if no corrective or preventive action occurs.

8. Inventories for cultural resources and native American values will occur on areas of proposed land uses. Protection of significant values will occur through avoidance and mitigative actions. Compliance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulations in 36 CFR 800 will occur before starting specific projects resulting from this plan's decisions.

9. All impacts are direct unless otherwise noted.

IMPACTS OF ALTERNATIVES ON RESOURCES

NO ACTION ALTERNATIVE

Recreation

Under this alternative there will be no opportunities for recreation. This will result in significant impacts to that portion of the public desiring to see and recreate on the San Pedro. The closure of the San Pedro EIS area to public recreation use, coupled with the absence of any developments, will benefit most other resources.

Areas of Critical Environmental Concern

Under this alternative ACECs and RNAs are not designated and there are no impacts to other resources. The special resources of the San Pedro, however, will not receive protection from an ACEC or RNA designation.

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Lands

Eliminating any provisions for new ROWs can have economic and social impacts due to the lack of new utilities or the increased costs of routing the utility lines over greater distances.

Water

Benefits will occur to water quality and quantity due to the absence of polluting activities and consumptive uses. The inability to pump water can adversely impact wildlife if surface flow disappears and water is not available.

Wildlife

Implementing the planned wildlife actions of this alternative will not have any impacts. Minor benefits will come from inventory and monitoring work.

Vegetation

The No Action Alternative will allow for natural plant succession on previously used farm and ranch lands. This natural succession will benefit wildlife habitat, soils and watershed.

Soil/Watershed

There will be minor benefits to soil and cultural resources through reduction of erosion caused by the lack of activities and by increases in vegetative cover.

Cultural/Paleontological

There will be no significant impacts from the cultural or paleontological management actions of this alternative.

Minerals

Benefits will occur to water and air quality and to visual resources under this alternative. There will be moderate impacts to the economic component.

Fire

Intense fires and the suppression actions on them will have some significant short-term impacts on cultural, paleontological, visual, soils, vegetation and wildlife resources. Long-term benefits can occur to visual, vegetation and wildlife resources.

Visual

This alternative makes no visual resource management (VRM) classifications. The protection offered by the more restrictive VRM classes will not be available. The area, however, will be managed as if it were a VRM Class III area. No impacts are anticipated from implementing this VRM Class III management.

Administrative Facilities

Continuing the use of the current facilities will have no significant impacts on any other resources.

Conclusion

Implementation of the resource management provisions of the No Action Alternative will not have any significant long-term impacts on the environment. This alternative will have a significant impact on recreational use and a moderate impact on the economic elements of the EIS area.

Certain resources will benefit from the No Action Alternative. These include water, wildlife, cultural, vegetation and soils.

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PRESERVATION ALTERNATIVE

Recreation

The recreation management provisions of the Preservation Alternative are expected to benefit most other resources. Prohibiting ORV use (closed designation) and the discharge of firearms, providing only a few small developments, and restricting use to primitive and non-impairing forms will provide moderate to significant benefits to water quality, wildlife, vegetation, soils, cultural and paleontological resources.

Impacts to off-road vehicle users will occur as this area is unavailable for their use. Recreation related to vehicles and roads is also significantly impacted as no roads are available for public use.

Implementation of this alternative will have both a negative and positive effect on public recreation expectations and may have economic impacts associated with restricted recreation opportunities.

Areas of Critical Environmental Concern

Designating the entire San Pedro EIS area as an ACEC and implementing the management guidelines of the Preservation Alternative provides protection for vegetation, soils, wildlife, water quality, visual, cultural and paleontological resources. Designation of the three RNAs and implementing the additional management constraints provides additional protection for the vegetation communities found in them. The designation of the RNAs will not significantly impact other resources.

Lands

Maintenance of existing ROWs will be subject to stipulations to protect cultural and paleontological resources. Impacts to these resources, therefore, are not expected to be significant.

Designation of ROW corridors at Charleston and Hereford will minimize adverse environmental impacts and the proliferation of separate ROWs. Construction in the corridors is dependent on a case-by-case environmental assessments. Some moderate impacts to visual resources, soils and vegetation are anticipated within these corridors. No impacts to other resources will occur outside the corridors.

Water

Not pumping the irrigation wells will have no significant benefits or impacts on water quality and quantity. The pumping of the non-irrigation wells will result in minor benefits to administrative activities.

Wildlife

Certain provisions of the wildlife management component of the Preservation Alternative will have benefits on resource values. Increasing species diversity will benefit recreation values. Completing habitat improvement projects (replanting farm fields, prescribed fire, developing ponds and marshes, planting trees) will benefit Threatened and Endangered and other wildlife species, vegetation, recreation and visual resources. These actions can cause minor to significant impacts to cultural and paleontological resources, soils, water, vegetation and visual resources.

Vegetation

Replanting abandoned farm fields with native grasses, forbs and/or shrubs will benefit wildlife, recreation and soil/watershed resources. Replanting will result in moderate

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benefits to soils and vegetation as it reduces erosion by increasing vegetative cover.

Prescribed fires can cause minor to significant short-term impacts to cultural, paleontological, soils, vegetation and visual resources. Significant long-term benefits will occur to vegetation. Minor benefits can occur to other resources.

Soil/Watershed

Gabion and dike installation will potentially provide significant benefits to fish and aquatic habitat. Building gabions and dikes on side channels can disturb cultural and paleontological resources through construction and siltation.

Constructing the St. David detention dam will reduce soil loss, deposit soils behind the structure, regrade the channel, and cause an increase in riparian vegetation. Moderate impacts to cultural, paleontological, vegetation, water, soils and visual resources can occur from construction.

Moderate benefits will occur from reestablishment of vegetation after removal of the farm-field dikes and berms. Removal of these dikes and berms will minimally increase soil erosion in the short-term and moderately in long-term as natural drainages reestablish themselves.

Cultural/Paleontological

No significant impacts will result from implementing the cultural/paleontological management actions in this alternative. Major benefits can occur to cultural and paleontological resources and the social element.

Mineral

Benefits will occur to air and water quality and to visual resources under this alternative. There will be moderate impacts to the economic component.

Fire

Full suppression of fires creates a potential for increases in future fire size and intensity, possibly resulting in moderate impacts to all resources.

Visual

Under the Preservation Alternative management of most of the San Pedro's scenic riparian corridor (92%) will be as VRM Class I and II areas. This will protect the scenic quality along the San Pedro River by restricting any changes in the visual character of the area (see Appendix 4). As this alternative proposes only a few small developments (highway pull-outs, signs) there will be little impact to visual resources on the San Pedro.

Administrative Facilities

Expansion of administrative facilities at Fairbank will have minor impacts on cultural, visual and vegetation resources. Continuing the use of other administrative facilities will not significantly impact any other resources.

Research

Development of a small research facility at Fairbank will have minor impacts on cultural, visual and vegetation resources. Moderate to significant benefits will result to those resources being studied.

Conclusion

Implementation of the Preservation Alternative will not have any significant impacts or benefits on the environment. Some

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resources will receive benefits from implementing the Preservation Alternative, including water, wildlife, vegetation, soil/watershed and cultural resources.

Implementing this alternative will cause both positive and negative effects on public expectations for recreation and will have moderate economic impacts resulting from restricted recreation opportunities.

Some moderate impacts can occur to cultural and paleontological resources from actions such as ROW corridor work, dam construction, fire suppression and habitat improvement projects.

UTILIZATION ALTERNATIVE

Recreation

Minor impacts are expected to water quality, wildlife, vegetation, soils, cultural and paleontological resources from the development of recreational facilities and overall recreation use. The ORV designation (limited to designated roads) will have major benefits for water quality, wildlife, vegetation, soils, cultural and paleontological resources.

Impacts to wildlife, vegetation, soils and cultural resources will be low because most of the large developments are in old farm fields and other previously disturbed areas. The total area of disturbance is about 130 acres, with 75% of this acreage in the four large developments. Many of the impacts will be short-term, with long-term benefits upon completion of landscaping around most of the developments.

Impacts to off-road vehicle users will occur as this area will be unavailable for their use.

Recreational use and development will result in moderate benefits to the economic component.

Areas of Critical Environmental Concern

Designating the entire San Pedro area as an ACEC and implementing the management guidelines of the Utilization Alternative will provide protection for vegetation, soils, wildlife, water quality, visual, cultural and paleontological resources. Designating the three RNAs and implementing the additional management constraints will provide additional protection for the vegetation communities found in them. The designation of the RNAs will not significantly impact other resources.

Lands

Work within the ROW corridors can have moderate impacts on cultural resources if not mitigated. These impacts become insignificant outside the corridors. Benefits will result to social and economic components due to presence of additional utilities in the San Pedro Valley.

Water

Limited well pumping will minimally impact surface water flow. Minor water quality impacts will occur from agricultural return flow. Limited pumping of irrigation wells will benefit vegetation in the local area of pumping. Minor soil disturbance will occur due to pumping the irrigation wells.

Wildlife

Minor impacts to cultural, paleontological, soils, water, vegetation and visual resources can result from development of habitat improvement projects, primarily during the short-term. Moderate

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long-term benefits will result to vegetation, wildlife, recreation and visual resources.

Vegetation

There will be short-term impacts to soils due to no replanting and the potential for increased erosion.

Soil/Watershed

The construction of dikes on the side channels will result in minor to moderate short-term impacts to cultural resources, water quality (from sedimentation) and soils (from erosion). The completion of functioning structures will stabilize the side channels and decrease erosion.

Cultural/Paleontological

Providing cultural and paleontological sites for interpretive use will result in benefits to recreation. The same applies to the social component by providing sites for scientific study and analysis.

Minerals

Allowing the existing sand and gravel operation to continue will cause increasing impacts to air quality, visual resources and wildlife. Because these disturbances are on a side drainage, no additional impacts to water quality are expected.

The development of new sand and gravel operations and their needed access can create significant but localized impacts on cultural and visual resources, vegetation, wildlife and air quality.

The local economy will benefit from the development of additional sand and gravel operations.

Fire

Full suppression of fires creates a potential for increases in future fire size and intensity, possibly resulting in moderate impacts to all resources.

Visual

The Utilization Alternative classifies much of the riparian corridor (84%) as VRM Class I and II, thus protecting the scenic quality along the San Pedro River (see Appendix 4). This alternative proposes slightly more development to occur in the larger acreage in the less restrictive VRM Class III and IV areas away from the river. Overall impacts to visual resources are expected to be low as most developments (campgrounds, buildings, signs, roads, pullouts) are in areas previously disturbed.

Administrative Facilities

Construction of a new administrative facility at Highway 90 and a new small facility at Fairbank will have minor impacts on soils, vegetation, wildlife, water, cultural and visual resources. The new facilities will have minor short-term benefits for the economic component.

Continuing the use of other administrative facilities will not significantly impact any other resources.

Research

Development of an adequate facility at either Fairbank or Highway 90 will have minor impacts on cultural, visual and vegetation resources. Moderate to significant benefits will occur to those resources being studied.

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Conclusion

Implementation of the resource management actions of the Utilization Alternative will minor to moderate impacts to all other resources. Many of these impacts are short-term and localized. Expansion of sand and gravel operations can cause significant impacts, especially to wildlife, vegetation, visual, recreation, cultural and paleontological resources. Benefits will occur to the wildlife, water, soils and vegetation resources, plus the economic and social components.

PREFERRED ALTERNATIVE

Recreation

Minor impacts are expected to water quality, wildlife, vegetation, soils, cultural and paleontological resources from the development of recreation facilities and overall recreation use. The ORV designation (limited to designated roads) will have significant benefits for water quality, wildlife, vegetation, soils, cultural and paleontological resources.

Impacts to wildlife, vegetation, soils and cultural resources are low because of the location of most of the large developments in old farm fields and other previously disturbed areas. The total area of disturbance is about 100 acres, with 83% of this acreage in the four large developments. Many of the impacts will be short-term, with long-term benefits upon completion of landscaping around most of the developments.

Impacts to off-road vehicle users will occur as this area will be unavailable.

Minor social benefits are anticipated. The level of recreation use may be less than some publics anticipate. For the most part the level of development and use is in line with the feelings expressed by the public in the social analysis. Recreational use will result in moderate benefits to the economic component.

Areas of Critical Environmental Concern

Designating the entire San Pedro EIS area as an ACEC and implementing the management guidelines of the Preferred Alternative will provide protection for vegetation, soils, wildlife, water quality, visual, cultural and paleontological resources. Designating the three RNAs and implementing the additional management constraints will provide additional protection for the vegetation communities found in them. The designation of the RNAs will not significantly impact other resources.

Lands

Work within the ROW corridors can have moderate impacts on cultural resources if not mitigated. These impacts become insignificant outside the corridors. Benefits will result to social and economic components due to the presence of additional utilities in the San Pedro Valley.

Water

Not pumping the irrigation wells will result in no significant benefits or impacts on water quality and quantity. Pumping one irrigation well in support of a reseeding project will result in moderate benefits to vegetation and wildlife. Minor benefits for the resource and administrative activities can occur from pumping the nonirrigation wells.

Wildlife

Construction of wildlife habitat improvement projects will cause

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minor impacts to cultural, paleontological, soils, water, vegetation and visual resources, primarily during the short-term. Completing these projects will benefit Threatened and Endangered and other wildlife species. Increasing species diversity will benefit recreation values.

The use of prescribed fires will cause short-term minor impacts to vegetation and visual resources. In the long-term, prescribed fires will benefit wildlife, vegetation, soils and visual resources and result in less intense and smaller wildfires.

Vegetation

Replanting and irrigating one farm field will result in minor short-term impacts to soils, vegetation, water and visual resources. Benefits will occur to vegetation, soils, and wildlife habitat by experimental seedings, natural revegetation and prescribed fires.

Soil/Watershed

Removal of the farm-field dikes and berms will minimally increase soil erosion in the short-term and moderately in the long-term. Construction of erosion control structures in side channels can have moderate impacts on cultural and paleontological resources.

Cultural/Paleontological

Providing cultural and paleontological sites for interpretive use will result in benefits to recreation. The same applies to the social component by providing sites for scientific study.

Minerals

The absence of the sand and gravel operations from the area will have benefits on visual, cultural and water resources. Impacts will occur to the economic component from the loss of sand and gravel sources.

Fire

The construction of fire breaks to reduce fire size will have minor to moderate short-term impacts on recreation, visual, soils/watershed, cultural, paleontological and vegetation resources. In the long-term, the reduction in fire size and intensity will significantly benefit all resources.

Visual

Under this alternative management of most of San Pedro's scenic riparian corridor (86%) will be as VRM Class I and II, thereby protecting the scenic quality by restricting any changes in the visual character of the area (see Appendix 4). Overall impacts to visual resources are expected to be low as most developments (campgrounds, buildings, signs, roads, pullouts) are in lands classified as VRM Class III and IV, areas previously disturbed.

Administrative Facilities

Construction of a new administrative facility at Highway 90 and a new small facility at Fairbank will have minor impacts on soils, vegetation, wildlife, water, cultural and visual resources. The new facilities will have minor short-term benefits to the economic component.

Continuing the use of other administrative facilities will not significantly impact any other resources.

Research

Development of an adequate facility at either Fairbank or Highway 90 will have minor impacts

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on cultural, visual, and vegetation resources. Moderate to significant benefits will occur to those resources being studied.

Conclusion

Implementation of the management actions of the Preferred Alternative will cause minor impacts to wildlife, soils, cultural, paleontological, vegetation, water and visual resources and the economic component.

Minor to moderate benefits will occur to the same elements described above, as well as the social component. This generally reflects short-term versus long-term effects of management actions.

MITIGATING MEASURES

The Management Guidance Common to All Alternatives section in Chapter 2 identifies measures that BLM will take to mitigate possible impacts to the resources of the EIS area. Additional measures are in Chapter 4 assumptions.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are those impacts created by the Proposed Action that cannot be mitigated. These impacts are as follows:

- The Proposed Action closes 47,668 acres to mineral entry. No prospecting, exploration or mining is allowed. The impacts will primarily affect the social and economic components.
- The Proposed Action closes 47,668 acres to off-road use by vehicles. Only designated roads will be available for vehicular use. The impacts will primarily affect recreationists using off-road vehicles and the social and economic components.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

This section identifies the irreversible and irretrievable commitments of resources resulting from the Proposed Action.

The Proposed Action proposes few actions not capable of being reversed. Impacts to cultural and paleontological resources are, if not mitigated, irreversible. Changes in cultural and paleontological resources and the loss of data are irretrievable. While there will be irreversible and irretrievable commitments, none are significant due to avoidance/mitigation.

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CHAPTER 5

CHAPTER 5

CONSULTATION AND COORDINATION

INTRODUCTION

The San Pedro Environmental Impact Statement was prepared by resource specialists at the Safford District Office. Assistance was provided by program leaders and specialists in the Arizona State Office. The State Office also reviewed the EIS for compliance with laws and regulations.

PUBLIC INVOLVEMENT AND CONSULTATION

Arizonans responded enthusiastically to BLM's request for comments and advice about the San Pedro riparian area. Since March of 1986 several hundred people have expressed an interest in performing volunteer work and assisting in other management needs on the property. Of the volunteers, many have inquired about and joined the Friends of the San Pedro River support group.

The SPEIS Team has -

1. called or written (to request advice and facts about management of specific San Pedro resources) other government agencies, interested groups and/or professional experts in these fields;

2. sent out three newsletters in 1986 and 1987 to a mailing list of about 280 organizations and individuals to update those involved with San Pedro about the progress of the planning;

3. conducted about 50 tours of the San Pedro management area for local officials and interested persons, BLM management personnel, Congressional visitors and school groups;

4. organized and led four technical committees (for cultural, biological, recreation and soil/water/air resources) to advise BLM on particular resources (For example, the Safford District archaeologist headed a group of seven people from the University of Arizona, Arizona State Museum, Arizona State Historic Preservation Office, a private consulting firm and the Amerind Foundation); and

5. conducted public meetings in Tucson (January 8, 1986), Sierra Vista (January 9, 1986), and Mesa (January 16, 1986).

The SPEIS team members and other district personnel have worked closely with an ad hoc committee formed to advise the BLM about interim management of the San Pedro.

OTHER ORGANIZATIONS AND AGENCIES CONSULTED

The SPEIS team consulted with and/or received comments from the following during the preparation of this document.

Federal

Bureau of Reclamation
Bureau of Indian Affairs
Fish and Wildlife Service
International Boundary and Water Commission
Soil Conservation Service
U.S. Army - Fort Huachuca
U.S. Border Patrol
Western Archaeological and Conservation Center (NPS)

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State

Arizona State Parks
Arizona State University
Arid Lands Research
Arizona Game and Fish Department
Department of Water Resources
State Land Department
University of Arizona

Local

Cochise County Board of Supervisors
Cochise County Planning Board
Cochise County Public Works Department
Sierra Vista City Government

Special Interest Groups and Individuals

Archaeological Conservancy
The Nature Conservancy
Sierra Club
Huachuca Audubon Society
Defenders of Wildlife
Tenneco
Mountain Bell
Sulfur Springs Valley Electric Power Cooperative
Arizona Public Service Company
Arizona Electric Power Cooperative
St. David Irrigation District
Sierra Vista Riding Club
Young Sand and Block Co.
Sierra Vista Ready-Mix
Bruce Huckell
Bernard Fontana
W. Bruce Masse
Jack S. Williams
Sheri Lerner
Anne Woosley
Hollis N. Cook
Sam Spiller
Frank Baucom
Bob Ohmart
Tom McMahon
Chuck Hunter
Troy Corman
Mark Stromberg
Doug Danforth
Bill Mannon
Frank Scruggs
Dale Shatto
Michael Gregory
Jim Herrewig
Harry Woodward
Lt. Col. Richard Wallenberg
Jane Chambers
Lester Mauk
Tom Turner
Sierra Vista Rod and Gun Club
Sierra Vista Lions Club
High Desert Garden Club
Republican Women's Club
Westerner's International Officer's Club
Sierra Vista Kiwanis International
Cochise Conservation Council
Director's Subcommittee on Recreation
Sam Negri
Raptor Task Force
Friends of the San Pedro River
San Pedro Water Resources Assoc.
Society of Army Military Engineers
Sierra Vista Rotary
Arizona Riparian Council
Cochise College
ORV Task Force
Boy Scouts of America
MENSA
Coronado Resource Conservation and Development Area
Arizona Association In and For Learning About the Environment
C. Vance Haynes
Steve Rogers
Jim Officer
Alan Ferg
Norman Whalen
Don Fiero
Mike Jacobs
Sharon Urban
Emil W. Haury
Jan Bell
Janus Associates, Inc.
Meron Architects Group
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Milton Curtis
John Escapule
R. Gwinn Vivian
David F. Myrick
John Irish
Susan Brew
Richard Myers
Beth Walton

DISTRIBUTION

Copies of the EIS will be sent to, and comments encouraged from, the following:

Federal Agencies

Advisory Council on Historic Preservation
Soil Conservation Service
Forest Service
Army Corps of Engineers
U.S. Army, Ft. Huachuca
Department of Commerce
Department of Interior
Bureau of Indian Affairs
Bureau of Mines
Fish and Wildlife Service
Geological Survey
Bureau of Reclamation
National Park Service
Environmental Protection Agency
Council on Environmental Quality
Western Archaeological and Conservation Center

State Agencies

Governor's Office
AZ Game and Fish Department
AZ Clearing House
State Historic Preservation Officer
AZ State Land Department
AZ State Parks
Arizona Commission on the Environment
University of Arizona
Arizona State University
AZ Department of Water Resources
AZ State Land Commission
Arizona Department of Transportation
Department of Library Archives and Public Records
Arizona Agriculture and Horticulture Department

Local Agencies and Groups

Cochise County Supervisors
Cochise County Planning and Zoning
Cochise County Public Works
Sierra Vista City Planning Office
Tombstone City Council
Benson City Council

Special Interest Groups

AZ Cattlegrowers
Cochise County Cattlegrowers
AZ Wildlife Federation
The Nature Conservancy
The Sierra Club
Huachuca Audubon Society
Defenders of Wildlife
Arizona 4-Wheel Drive Association
Safford District Advisory Council
Safford District Grazing Advisory Board

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The Wildlife Society
The Wilderness Society
Public Lands Council
National Council of Public Land Users
League of Women Voters

Elected Representatives

Federal

Senator Dennis DeConcini
Senator John McCain
Representative Jim Kolbe
Representative Morris K. Udall
Representative Bob Stump
Representative Jon Kyle
Representative Jay Rhodes

State

Representative Gus Arzberger
Representative Joe Lane
Senator Carol McDonald
Representative Bart Baker
Representative Bill English

Indian Tribes

Ak-Chin (Maricopa) Papago
Gila River Pima
Salt River Pima
Tohono O'odham (Papago)
San Carlos Apache

PREPARATION AND REVIEW

Arizona State Office Assistance

The following people from the Arizona State Office provided technical assistance and review for this document.

Name	Position
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E. Dahlem	Wildlife Biologist
D. Doyen	Fire Management Officer
D. McGlothlin	Hydrologist
K. Pearson	Planning/Environmental Coordinator
A. Rabinoff	Geologist
G. Ramey	Range Conservationist
G. Stumpf	Archaeologist
C. Gawin	Cartography
B. Talbot	Outdoor Recreation Planner

Safford District Office Assistance

The following people from the Safford District Office provided technical assistance and review for this document.

Ray Brady	District Manager
Lyle Rolston	San Simon Area Manager
John Augsberger	Wildlife Biologist
Erick Campbell	Project Manager, San Pedro

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List of Preparers

Name	Position	EIS Assignment	Education	Experience
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Gay Kinkade	Archaeologist	Archaeology/ Paleontology	B.A., History, Ft. Lewis College, M.A., Eastern New Mexico Univ.	2 yrs. AZ Stat Museum 13 yrs. BLM
Ron Loomis	Mining Engineer	Minerals	B.S., Engineering, U.S. Coast Guard Acad., B.S., Univ. of Arizona	12 yrs. BLM
Del Molitor	Hydrologist	Water Resources	B.S., Hydrology, Utah St. Univ.	7 yrs. For. & Range Exp. S 10 yrs. BLM
Pete Zwaneveld	Outdoor Recreation Planner,	Recreation/ACEC/ Visual/Wilderness	B.S., Outdoor Recreation, Utah St. Univ.	½ yr. NPS 9½ yrs. BLM

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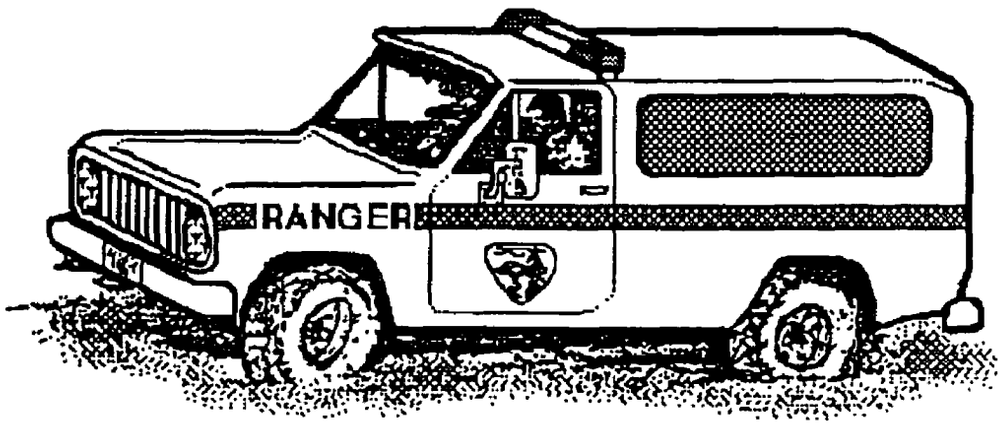
APPENDICES

GLOSSARY

BIBLIOGRAPHY



APPENDIX 1

CULTURAL RESOURCE MANAGEMENT OBJECTIVES

All cultural resource properties, both known and projected to be present, will be managed under each alternative according to the management objectives established for the property. The management objectives are determined by the type of values, e.g., scientific, public use, held by the property. A site may have more than one management objective assigned and the objectives do not have to be fully compatible. The management objectives established for a given site may be changed as new data is acquired or management goals change. The following management objectives were established for the EIS area.

1. Manage for Information Potential. Cultural resources included under this objective are capable of contributing useful scientific, historic, or management information. This information potential is to be protected to the extent needed, by physical or administrative means, until the potential has been realized through appropriate study.

2. Manage for Public Values. Cultural resources included under this objective possess identified socio-cultural, educational, recreational, or other public values. Their locations are to be managed in a manner that gives adequate consideration to these values.

3. Manage for Conservation. Cultural resources included under this objective have overriding scientific or historic importance. They are to be managed to maintain them in their present condition and to protect them from potential conflicting land or resource uses.

4. Manage on Interim Basis. Cultural resources included under this objective may possess a variety of values. Properties would be managed under this objective only under the No Action alternative. The goal would be to comply with legal requirements. Intensive management would not be implemented. Management would be strictly reactive and not proactive. Sites would be managed on a case-by-case basis to protect them from potentially conflicting uses as required by laws and regulations.

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APPENDIX 2

CULTURAL RESOURCE USE CATEGORIES

Use will be allocated within the framework of the site's historic context. A site should generally be allocated to a single use - the primary intended use - and management prescriptions formed to allow non-conflicting uses. Sites of each historical context should be included in each applicable use category but equal representation of each use contegory in each historical context in not a goal. Use allocation will be deferred to Cultural Resource Management Plans (CRMP) except for sites that have been allocated in this management plan. The Bureau's Cultural Resource Use Categories are as follows.

A. Scientific Use is a category that applies to any cultural property determined to be suitable for consideration as the subject of scientific or historical study utilizing research techniques currently available, including study which would result in its physical alteration, and signifies that it need not be conserved in the face of an appropriate research or data recovery (mitigation) proposal. (Management Objectives: Manage for Information Potential).

B. Management Use is a category that may be applied to any cultural property considered most useful for controlled experimental study which would result in its physical alteration, to be conducted by the BLM or other entities concerned with the management of cultural properties. Expenditure of cultural properties or cultural resource data may be justified for purposes of obtaining specific information which would ultimately aid in the management of other cultural properties. Experimental study may be aimed toward a better understanding of kinds and rates of natural or human-caused deterioration, effectiveness of protection measures, and similar lines of inquiry. (Management Objective: Manage for Information Potential).

C. Public Use is a category that may be applied to any cultural property found to be appropriate for consideration as an interpretive exhibit-in-place, a subject of supervised participation in scientific or historical study, or related educational and recreational uses by members of the general public. (Management Objectives: Manage for Public Values).

D. Socio-cultural use is a category to be applied to any cultural resource that is perceived by a specified social and/or cultural group as having attributes which contribute to maintaining the heritage or existence of that group. This use category signifies that the cultural resource is to be managed in a way that takes those attributes into account, as applicable. (Management Objective: Manage for Public Values).

E. Conservation for future use is a category reserved for any unusual cultural resource which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance or architectural interest, or comparable reasons, is not currently

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appropriate for consideration as the subject of scientific or historical study which would result in its physical alteration. It is considered worthy of segregation from other land or resource uses which would threaten the maintenance of its present condition, and it will remain in this use category until the following provisions are met in the future. (Management Objective: Manage for Conservation).

1. No other property exists that could yield the information required to meet the priority regional (southeast Arizona) research objectives.

2. All properties of this type allocated to public use have been developed to their greatest capacity for public use and no other property exists that could meet a high public need and demand for public use.

3. The change in allocation to another use is determined by the District Manager to be the best use of the property at the time to meet the District's and the Bureau's cultural resource management goals.

4. Another property has been discovered which would be as suitable for allocation to conservation use and it will be so allocated.

5. The property was allocated to conservation use because its research potential surpassed the current state of the art and research methodologies have developed to the point where the property's research values can now be appropriately recovered.

F. Discharged use means either: 1) that a cultural resource that was previously qualified for assignment to any of the categories defined above no longer possesses the qualifying characteristics for that use or for assignment to an alternative use 1/; or 2) that a cultural property's scientific use potential was so slight that it was exhausted at the time the property was recorded, and no alternative use is appropriate 2/. Allocation to discharged use also means that records pertaining to the property represent its only remaining importance, and that its location no longer presents a management constraint for competing land uses.

1/ A small, shallow rockshelter could be fully excavated, thereby realizing its scientific use potential, or it could be completely looted, destroying its potential. Knowledge that it once existed is still important, and it would continue to be represented in the inventory records.

2/ A small lithic scatter could be sufficiently recorded on discovery that no further field study could be needed. Because field inspection and recording of individual cultural properties must precede the recommendation and allocation, classes of unrecorded cultural properties may not be allocated to discharged use in advance of discovery.

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APPENDIX 3
COMBINED PLANT COMMUNITIES

Brown, Lowe and Pase Communities	Combined Plant Communities *											
	1	2	3	4	5	6	7	8	9	10	11	12
143.123 Tobosa Mixed Scrub						X						
.141 Sacaton Association			X									
.142 Sacaton Mesquite Assoc.			X									
.152 Mixed Grass-Mixed Scrub							X					
.155 Mixed Grass-Mixed Scrub					X							
.156 Mixed Grass-Mixed Scrub					X							
.157 Mixed Grass-Whitethorn		X										
.163 Burroweed-Mesquite							X					
.164 Burroweed-Mixed Scrub							X					
153.243 Mesquite-Mixed Scrub				X								
153.261 Catclaw-Mixed Scrub								X				
.215 Mixed Chihuahuan Scrub								X				
.221 Whitethorn Association								X				
.272 Mixed Chihuahuan Saltbush								X				
154.213 Creosote-tarbush	X											
223.231 Mesquite Association										X		
.232 Mesquite Short-tree Assoc.										X		
.211 Cottonwood-willow Riparian									X			
233.210 Riparian Scrub								X				
.221 Salt Cedar Bosque											X	
243.321 Bullrush-Sedge Association												X

Source: District Files

*

1	Creosote-tarbush	7	Disclimax Grassland
2	Mixed Grassland-Whitethorn	8	Chihuahuan Desert Scrub
3	Sacaton-Grassland Mixed Scrub	9	Cottonwood-willow Riparian
4	Mesquite-Mixed Scrub Association	10	Mesquite Bosque
5	Upland Scrub Grassland	11	Salt Cedar Bosque
6	Bottomland Scrub Grassland	12	Cienega

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APPENDIX 4

VISUAL RESOURCE MANAGEMENT

The Bureau of Land Management's Visual Resource Management (VRM) system provides a method for analyzing and managing visual resources on public lands.

The basis of the VRM system is an inventory of visual resources. The components of the inventory are determinations of scenic quality, numbers of viewers, public attitudes regarding maintenance or modification of the scenery, the distance from which areas are viewed, and the existence of special considerations such as natural area or wilderness designations. All of these components are incorporated into a formula used to determine VRM objectives.

The management objectives for each VRM class are:

Class I: Preserve the existing character of the landscape. This class provides for natural ecological change; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II: Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Class III: Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV: Provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. Every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The VRM objectives are accomplished through the application of visual contrast ratings. These ratings are completed for all proposed modifications of the landscape. They compare the before and after scenarios and determine whether a proposed modification meets the objectives for a particular location. The rating also determines the mitigation that may be needed to lessen or eliminate impacts to visual resources.

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APPENDIX 5

WATER RESOURCES

1. Surface Water

The major source of surface water for the acquired lands is the San Pedro River. The river enters the Palominas lands from Mexico, in the NE¼NW¼, Sec. 19, T. 24 S., R. 22 E., and flows in a northeasterly direction until the river leaves the Palominas lands in NW¼NE¼, Sec. 4, T. 24 S., R. 22 E. The river then enters the lower end of land grants in the SW¼SW¼, Sec. 22, T. 23 S., R. 22 E., flowing in a north-northeasterly direction, and exits from the upper land grant in the NE¼, Sec. 32, T. 18 E., R. 21 E. In the three miles of land between the two land grants, the river flows in and out of the administrative boundaries, mostly outside of the boundaries. The river channel briefly re-enters the northern lands in the NE¼SE¼, Sec. 29, T. 18 E., R. 21 E., and leaves the lands in the SE¼NE¼ of the same section.

The San Pedro River originates in desert grasslands of northern Sonora, Mexico, and flows about 140 miles north to enter the Gila River near Winkelman Arizona. Its watershed of over 4000 sq. mi. includes most major vegetational life zones of North America, ranging from coniferous forests on mountains higher than 7400 ft. above mean sea level to Sonoran desert scrub at 1800 ft. elevation near the river's mouth. Much of the mainstream flows through structural basins over valley fill approaching or exceeding 1000 ft. thick. Its floodplain is usually a half mile or more wide, except where bedrock outcrops approach the stream near the Charleston area. Bedrock near the surface also promotes emergence of subterranean water, insuring sections of perennial flow. Zones of strong artesian pressure occur in the vicinity of Palominas and Hereford, and St. David and Benson.

The total watershed area of the San Pedro River is 4,483 square miles, 696 square miles of which is in Mexico. Total watershed area at Palominas--just south of the BLM property--is 741 square miles. The watershed is 2,500 square miles at Benson, which is 10 miles north of the property.

The inner valley of the modern San Pedro River is part of an alluvial river system; that is, it is a river which is formed in fluvial sediments transported, deposited, and reworked by the river, itself. The river and its riparian zone are thus dynamic systems undergoing constant adjustments in response to changes in runoff, sedimentation rates, and channel and floodplain conditions.

The San Pedro River is an important and unique perennial desert stream. However, by most accounts the river system is degraded both in terms of historic hydrologic condition and habitat diversity. That degradation is associated closely with the episode of river entrenchment that occurred between about 1880-1920 and resulted in the loss of cienega reaches and further incised already-existing entrenched reaches. Entrenchment set into motion a number of important

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adjustment processes—geomorphic, hydrologic, and biologic. Most of those adjustments are continuing today and if permitted to proceed more or less naturally may have profound influence on resource conditions along the San Pedro River.

Most of the San Pedro River mainstream today is incised. Downcutting is greater than 9 to 13 ft. where floodplains are narrow, but erosion progressed laterally in wider places to create a broad channel occupied by a relatively small wetted area during drought, and filled during floods by a turbid, erosive river. Discharge at Charleston has averaged 59 cfs over 65 years. Flow patterns are distinct, with flooding in winter and summer separated by spring and autumn droughts. A large percentage of total water yield occurs during infrequent flooding events, as characteristic of most lower elevation Southwestern streams.

Incision has resulted in declines in local water tables and drying of former floodplain features like ox bow lakes and marshes not fed by springs. Areas classed as dense riparian vegetation, marshland, river channel, and streambed all have been substantially reduced in the past five decades and were even more extensive a century ago. Yet, some parts of the river remain relatively unincised, and riparian vegetation grows as a dense and viable corridor where not cleared for agriculture. Only a few cienegas, floodplain lakes, and spring-fed marshlands persist (see map for location).

Following the rapid sequence of entrenchment, which occurred between 1880 and 1925, the San Pedro River has, and is continuing, to undergo an evolution to a new dynamic equilibrium condition which reflects current hydrologic and land use conditions. That evolution consists primarily of widening, bar development and the creation of floodplains. Widening is the primary prerequisite for reestablishment of stable floodplains vegetation communities, which then (in turn), contribute to sediment deposition and the development of properly functioning floodplains.

Characteristics of the low flow channel are generally similar along the length of the reach. The channel is extremely shallow, wide, and sand bedded throughout most of its length. Sand continues to be transported as bedload even during low flood periods. As a result, the channel is devoid of any significant pools, and banks are often either poorly developed or partially inundated by sand. There are several reaches (specifically at Charleston and near the Tombstone gage) where bedrock influences channel characteristics and some structural features, including small pools and developed banks, exist.

Surface flows in the San Pedro River occur as both rainfall runoff and groundwater discharge. The highest annual flows occur in the July-September period in response to short-duration, high-intensity thunderstorms. These flows are "flashy" and are characterized by extremely rapid rises, high peak flow rates, and rapid

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declines back to base flow conditions. A secondary period of rainfall runoff in the winter is less flashy than summer events and generally produce much lower peak flow rates. Annual low flow periods commonly occur in May to June and November. Baseflows represent discharge from the floodplain aquifer, which in turn is recharged both by the regional aquifer system and by rainfallinduced high flows. The river is perennial from the Hereford area to just below the Charleston Hills due to the discharge of ground water to the stream. However, base flows in perennial reaches are highly variable depending upon distance downstream. During the hot, dry season, flow in segments of the channel north of the Fairbank area will disappear into the streambed and may reappear for short durations further downstream.

Discharge rates are not only influenced by the amount and timing of runoff and groundwater discharges but also by channel and floodplain characteristics, and losses due to evaporation, phreatophyte transpirations, groundwater recharge, and man-made diversions and withdrawals. At present, the only surface diversion is just upstream from the northern boundary of the BLM property and owned by the St. David Irrigation District.

The St. David Irrigation District diverts the river flow into their irrigation ditch by means of a dam across the main channel, in the NE¼SW¼, Sec. 4, T. 19 S., R. 21 E. The earthen dam is often breached during a flood and is quickly rebuilt by the Irrigation District, usually within a week. The dam diverts up to 99 percent of the surface flow, but side channels (called siphons) are constructed at various points along the main ditch to return excess flow back to the river channel.

All of the tributaries of the river confined within the acquired lands have ephemeral flow, except the Babocomari River. The segment of the Babocomari River that lies within the lands is considered to have intermittent flow, but the segment is usually perennial during wet years. This stream flows into the San Pedro River near the Fairbank site. Green Brush Draw is another of the important tributaries, with its confluence to the San Pedro River located just inside the southern boundary of the lands. The headwaters for Green Brush Draw originate south of Bisbee and east of Naco, Arizona and Naco, Mexico. The flow is essentially ephemeral (short duration), flow occurs only after intense or long-duration storms.

The other surface water sources consist of eight permanent springs, one stock pond and several holding ponds in the vicinity of the two active gravel operations. These latter ponds were created as holding ponds for fines from the gravel crushing and washing operation, and as a source of water for gravel crushing. The springs are all undeveloped.

Discharge Data

The U.S. Geological Survey has operated three stream gages in or adjacent to the study reach at Palominas, Charleston,

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and near Tombstone. Streamgage information and Period-of-Record for each gage is described in Table 1.

Two of the streamgaging stations are located within the lands, and are maintained by the U.S. Geological Survey. The two stations are Charleston, located at the Charleston Bridge, and Tombstone, two miles northeast of the Fairbank Administrative Site.

The Charleston gaging station has measured continuous flow since 1912. For the 75 years of streamflow record, the least amount of flow measured to date has been 0.3 CFS in July, 1982. The Tombstone site has been operational since April 1967. The U.S. Geological Survey ceased operation of this station at the end of the 1986 Water Year. There are usually a number of days (30 or more) each year when no flow is measured at this station. The period of no flow is dependent upon the duration of the short-term droughts and the amount of precipitation falling on the watershed upstream.

The other gaging station on the San Pedro River is located near the town of Palominas, two miles south of the acquired lands. The station measures intermittent flow because irrigation in the area would tend to dry up the stream. This station had 39 years of records under the guidance of the U.S. Geological Survey. Since October, 1981, the station has been maintained by the International Boundary and Water Commission, El Paso, Texas.

Mean annual discharge in the San Pedro River at Charleston averages about 60 cfs over the 72-year period of record. Since 1932, the mean annual discharge at Palominas averaged 33 cfs. The mean annual discharge at Tombstone (1967-1984) averaged 54 cfs. Annual flows at Charleston are 79 percent higher than at Palominas. This is due in part to the larger contributing watershed and the correspondingly larger peak flows at Charleston, and in part to the substantial groundwater contribution to the stream between Palominas and Charleston.

Thorough analysis of annual discharge is provided in Putman, et al, (1987). A summary of annual discharge, total runoff volume (acre-feet), and annual winter-period and summer period peak flows is provided in Table 2 for the river at Charleston. Statistical summaries of mean annual discharge and total runoff volume are provided in Table 3. Median annual flows are discussed below.

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Table 1

U.S. Geological Survey Stream Gages
on or Near the BLM San Pedro River Properties
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Gage	Location	Period of Record	Drainage Acres
094705.00 (at Palominas)	T23S, R22E, Sec. 33	1932-1981	741 (649 in Mexico)
094710.00 (at Charleston)	T21S, R21E, Sec. 11	1902-1986+	1219 (696 in Mexico)
094715.50 (near Tombstone)	T19S., R21E, Sec. 28	1968-1986	1740 (696 in Mexico)

Source: U.S. Geological Survey

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Table 2
Charleston, Annual Flow Data
Bureau of Land Management
Safford District, Arizona

Water Year	Mean Discharge cfs	Total Runoff Ac - ft.	Peak Winter (Nov.-Mar.) Flow, cfs	Peak Summer (July-Sept.) Flow, cfs
1905	62	44,880	669	287
1913	32.8	23,710	211	846
1914	106	76,540	1120	3000
1915	206	149,300	3000	1090
1916	47.2	34,280	400	1760
1917	125	90,181	105	5180
1918	28	20,290	20	920
1919	128	93,010	56	6050
1920	57.2	41,760	590	860
1921	140	101,500	19	6700
1922	50.4	36,500	23	1900
1923	58.3	42,230	33	3080
1924	34.8	25,260	562	524
1925	50.8	36,790	14	2400
1926	170	122,700	38	28,800
1927	71.4	51,660	60	2050
1928	27.7	20,070	27	350
1929	74.7	54,070	64	3650
1930	73.9	53,500	65	3590
1931	89.7	64,960	476	4090
1932	63.3	45,940	717	1720
1933	38.9	28,140	102	1430
1934				
1935				2000
1936	61.6	44,700	630	3400
1937	77.3	55,980	38	3880
1938	47.8	34,610	58	22901
1939	68.8	49,800	625	3080
1940	80.6	58,490	163	9100
1941	56.3	40,730	1720	2530
1942	32.8	23,720	164	852
1943	65.8	47,620	21	2910
1944	33.5	24,300	43	1240
1945	52.2	37,800	31	3190
1946	46.3	33,490	25	3760
1947	44.6	32,290	20	2910
1948	45.7	33,170	24	1530

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Table 2 (cont.)

Water Year	Mean Discharge cfs	Total Runoff Ac - ft.	Peak Winter (Nov.-Mar.) Flow, cfs	Peak Summer (July-Sept.) Flow, cfs
1949	65.2	47,180	263	1880
1950	43.4	31,430	72	1950
1951	27.2	19,660	19	1010
1952	26	26,140	16	1840
1953	39.2	28,400	60	3330
1954	120	86,730	16	5690
1955	120	86,910	23	4050
1956	28.2	20,500	25	1330
1957	31.0	22,430	73	1400
1958	103	74,740	29	3890
1959	60.9	44,070	30	3960
1960	33.5	24,300	1250	479
1961	30.9	22,390	21	1010
1962	18.3	13,280	156	457
1963	46.4	33,630	14	2130
1964	75.6	54,910	45	5510
1965	22.3	16,130	23	929
1966	50.5	36,590	508	1230
1967	32.6	23,720	16	1622
1968	35.6	25,850	2400	402
1969	24.0	17,360	15	861
1970	36.3	26,280	20	1780
1971	70.4	50,980	19	2200
1972	34.1	24,780	26	2060
1973	28.4	20,550	482	572
1974	53.2	38,530	26	3410
1975	30.7	22,230	18	1550
1976	35.2	25,530	67	1400
1977	35.0	25,330	25	841
1978	119	86,090	263	86,090
1979	113	81,630	7750	482
1980	13.2	9,590	23	287
1981	25.6	18,530	11	656
1982	23.1	16,740	12	1830
1983	41.3	29,870	585	665
1984	122	88,870	524	2930
1985	70.5	51,050	6090	1950

Source: U.S. Geological Survey

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Table 3
Charleston Annual Flow Summaries
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Discharge	Dates	No. of Samples	Mean	S.D.
Mean Annual Discharge, cfs.	1905-1930	19	81.29	50.83
Mean Annual Discharge, cfs.	1931-1985	53	52.83	28.66
Mean Annual Discharge, cfs.	1905-1985	72	60.34	37.63
Mean Total Runoff, Ac - ft.	1905-1985	72	43,707.22	27,242.57
Mean Total Runoff, Ac - ft.	1931-1985	53	38,277.17	20,765.38
Median Mean Annual Discharge, cfs.	1905-1985		49.1	
Median Mean Annual Discharge, cfs.	1931-1985		44.6	
Mean Winter Peak Flow	1905-1930	19	373.42	706.23
Mean Summer Peak Flow	1905-1930	19	3,866.05	6,334.84
Mean Winter Peak Flow	1905-1985	72	461.79	1,227.70
Mean Summer Peak Flow	1905-1985	73	3,781.85	10,384.58
Mean Winter Peak Flow	1931-1985	53	493.47	1,371.65
Mean Summer Peak Flow	1931-1985	54	3,759.96	11,526.84

Source: U.S. Geological Survey

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Flow Data Computations

Mean monthly flows at the three streamgages are summarized in Table 4. Mean monthly flows provide a good index of average monthly runoff volumes. As indicated by the range and standard deviation statistics, mean monthly flows are highly variable from year to year.

Median monthly flows for all three streamgages are given in Table 4. Average median monthly flow is a good indication of daily flows likely to be encountered in any given month. Because of the skewed nature of daily flow distributions, median monthly flows are considerably lower than the corresponding mean monthly flow. Median monthly flows are also highly variable from year to year, but are somewhat less variable than mean monthly flow.

Flow Data

Annual mean daily flow-duration curves were developed for the San Pedro River at Palominas, Charleston, and Tombstone stream gates, (see Attachment 1). The curves show discharge plotted against the average percent of the time (in terms of days in a year) that discharge was equaled or exceeded. Thus, the curves indicate the average duration of both high and low flows and the 50 percent discharge is equivalent to the median daily discharge over a one-year period.

Median daily flows averaged 2 cfs at Palominas, 14 cfs at Charleston, and 12 cfs at Tombstone. At Palominas, discharge is less than 1 cfs about 37 percent of the time, and greater than 100 cfs less than 5 percent of the time. At Charleston, discharge is less than 10 cfs about 30 percent of the time, and greater than 100 cfs less than 10 percent of the time. At Tombstone, discharge is less than 1 cfs over 10 percent of the time, and greater than 100 cfs about 7 percent of the time.

Low Flow Analysis

Annual 1-day, 7-day, 30-day, and 90-day low flows were analyzed for means, standard deviations, and trends over time at the Charleston and Palominas gages. The period of record at Tombstone gage was deemed to be too short for a meaningful low-flow analysis. In addition, mean monthly flows for May and November (the normal low flow months) were analyzed.

Mean annual low flows at Charleston for the 1931-1984 period ranged from 2.36 cfs for the 1-day low flow to 7.78 cfs for the 90-day low flow. For the entire 1914-1984 period of record mean annual low flows at Charleston ranged from 2.27-7.63 cfs, respectively, for the 1-day and 90-day low flow period. Low flows have declined over time at Charleston for both periods of record and for all low flow periods (1-day to 90-day). That decline is highly significant ($p = 0.99$) for all low-flow periods during the 1931-1984 period of record, and is also significant for the 1914-1984 period of record (see Attachment 2).

Mean annual low flows at Palominas for the 1932-1981 period ranged from 0.18 cfs for the 1-day low-flow period to 1.67

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cfs for the 90-day low-flow period. As at Charleston, low flows are declining over time ($p = 0.99$) for all low flow periods. Since 1950 it is common to have zero flow for both the 1-day and 7-day periods, and not uncommon to have zero flow for the 30-day period.

May and November flows at Charleston average 8.96 cfs and 17.44 cfs respectively and also show significant declines over time. May flows at Palominas average 1.32 cfs and also show significant declines over time. Conversely, November flows at Palominas average 5.10 cfs and do not show a significant decline over the period of records.

It is only possible to speculate as to the causes of declining base flows in the river. However, since base flows are keyed to the discharge of groundwater to the stream from the floodplain aquifer, it is clear that less groundwater is finding its way to the stream channel. Reductions in groundwater inflow could be caused by: (1) reduced recharge of the floodplain aquifer by the regional aquifer; (2) reduced recharge of the floodplain aquifer by surface runoff (high flows); (3) increased use of the floodplain aquifer through pumping; (4) increased use of the floodplain aquifer by phreatophytes; or (5) increased loss of floodplain aquifer water to the regional aquifer.

It does not appear that declines in base flows can be attributed to declines in overall runoff in the basin. Also, it is unlikely that changes in phreatophyte use or losses to the regional aquifer have significantly affected base flows. Thus, it can be deduced that either groundwater pumping in the floodplain aquifer, reduced recharge from the regional aquifer, or a combination of both have contributed to the lower base flows recorded at both gages.

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Table 4
San Pedro River Average Mean Monthly Discharge in cfs (1931-1983)
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

	Palominas			Charleston			Tombstone		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Month	DISCHARGE								
Oct.	25.5	121	0-770	36.4	150	3.4-1087	99	262	0-998
Nov.	5.1	7.7	0-43	14.9	9	5.6-62	14.6	14	2.8-61
Dec.	22.2	70	.1-414	31.2	62	8.6-429	50.0	99	6.4-373
Jan.	22.9	73	.04-452	33.5	72	9.7-507	52.5	109	9.7-432
Feb.	11.5	16	.07-73	25.3	22	9-112	41.2	54	9.1-224
Mar.	8.4	14	.22-76	21.4	19	9-110	36.4	44	9.1-179
Apr.	2.9	3	0-15	12.4	5	6-31	13.3	7	4.2-29
May	1.3	2	0-7	8.3	3	3.9-15	7.3	3.8	1.6-17
June	4.1	6	0-23	10.5	14	1.3-89	3.9	6	0-22
July	89.8	71	3-280	122.4	93	6-359	113	105	1.8-369
Aug.	151	162	3-591	230	226	10-968	158	192	14.7-82
Sept.	35.7	51	.3-275	64	69	4.1-350	56.4	56.8	.09-177

Source: U.S. Geological Survey

Table 4
San Pedro River Average Median Monthly Discharge in cfs (1931-1983)
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

	Palominas			Charleston			Tombstone		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Month	DISCHARGE								
Oct.	3.7	5.9	0-30	12.2	11.9	3-80	13	19	0-55
Nov.	3.6	3.8	0-14	13.6	5.5	5.8-25	12.2	7.6	2.3-29
Dec.	5.5	5.5	0-16	17.1	6.4	8.5-37	20.2	19.2	7.3-88
Jan.	10.9	26.7	0-1682	23.5	31.1	9.5-230	35.8	52.5	10-229
Feb.	8.6	--	.19-70	20.3	12.3	9.5-80	32.1	28.7	9.1-108
Mar.	6.3	9.7	.01-51	18.9	12.4	9.5-76	29.1	23.1	9.1-179
Apr.	2.5	3.0	0-12	12.2	5.0	6.1-24	15.7	11.1	4.2-29
May	1.2	1.6	0-8	7.9	2.4	3.6-15	1.4	4.4	1.6-17
June	0.6	0.8	0-3.2	4.2	2.1	1.5-12	30.0	2.9	0-22
July	15.7	23	0-102	29.1	29.8	0.8-137	67.2	39.2	1.8-369
Aug.	51.9	77	.5-443	91.6	105.7	4.2-586	18.4	109.6	3.4-464
Sept.	10.7	18	0-91	24.2	24.6	3.8-140	18.4	15.2	.56-46

Source: U.S. Geological Survey

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Gain-Loss Analysis

The analysis of the stream-gage data at Palominas, Charleston and Tombstone suggests that the San Pedro River baseflows increase greatly between Hereford and Charleston, and then decreases somewhat by Tombstone. For example, the annual median flow at Palominas is 17,808 ac-ft; is 30,400 ac-ft at Charleston; and is 34,300 ac-ft at Tombstone (Putman, et al., 1987). Similarly, 1-day 7-day, 30-day, and 90-day low flows as well as mean May and November flows were shown above to increase greatly between Palominas and Hereford. Putman, et al. (1987) found the average monthly gain in the San Pedro River between Palominas and Charleston for December-March of the 1967-1981 period to be 635 acre-feet per month.

Putman, et al. (1987) suggest two reasons for the large gains in base flows between Palominas and Charleston. First, this is an area of recharge to the floodplain aquifer from the regional aquifer. In fact, several wells in the region which tap into the regional aquifer are under artesian conditions. Secondly, bedrock at the Charleston Hills immediately downstream of the Charleston gage is believed to serve as a barrier to shallow groundwater flow, thus forcing shallow groundwater to the surface.

The gain-loss analysis clearly indicates the close interdependency between surface water flows and the groundwater system.

To further quantify baseflow gains and losses within the study reach, seven locations were selected for regular stream gaging. The results, as of May 1986, of that gaging record suggest that the streamflows increase an average of 27 percent between Hereford and the bridge at Lewis Springs, and 49 percent between Lewis Springs and Charleston. From Charleston to a location just downstream of the Charleston Hills flows tended to decrease an average of 5.4 percent. Between Charleston Hills and the bridge at Fairbank flows tended to increase slightly by about 5.3 percent. Average discharge then increased by 9 percent between Fairbank and Tombstone gage, and decreased by 16.6 percent between the Tombstone gate and a point upstream of the St. David Diversion.

Quantification Study

In order to achieve a better understanding of the unique surface groundwater relationship occurring within the lands, and with an urgent need to quantify and evaluate water-related management strategies, the District Office (via the BLM State Office) submitted a request in mid-1986 to the BLM's Denver Service Center (DSC) to prepare a plan for a proposed water resources assessment project for the San Pedro lands. The plan was written and accepted by October. The purpose of the project was to assist district planning by providing water resource information for land use planning, and to quantify the relationship between surface and groundwater resources, while developing a strategy for the acquisition of an instream flow water right.

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An interdisciplinary team was formed representing key water resource conditions, values, and issues. The objective was to develop expert analyses to various components of the water resources management issue, and to facilitate interaction between specialists in evaluating alternative management objectives and strategies. Disciplines represented on the project team included surface water hydrology/geomorphology, groundwater hydrology, fisheries, riparian vegetation, recreation, and water rights. Literature reviews and interviews with various professional contacts were conducted during November and December 1986. In December, the team of specialists from DSC toured the lands. The team, consisting of a Surface Groundwater Hydrologist, Hydrologist, Fisheries Biologist, Water Rights Specialist, and a Recreation Planner, was accompanied by Arizona State Office and District personnel. The team members walked the length of the study area to subjectively evaluate conditions, processes, issues and interactions. Aerial photography of the entire study reach was acquired and used to help evaluate, stratify, and select field survey locations.

A detailed field survey was conducted in January 1987. A number of riparian area cross sections were surveyed, a series of riparian area watertable observation wells were installed, riparian vegetation was described and measured along cross sections, and bi-weekly stream gaging was initiated at various locations. Field sampling locations are located in Table 5. Throughout the study, information was collected on water rights affected by the San Pedro River.

The interdisciplinary team prepared a preliminary report of their findings which was issued in early June 1987. The report was entitled "Assessment of Water Conditions and Management Opportunities in Support of Riparian Values: San Pedro River". Data is being continuously collected and analyzed, with a final report to be issued during 1988.

2. Groundwater

Hydrogeologic Setting

The Upper San Pedro Basin contains several hundred feet of consolidated and unconsolidated sedimentary deposits most of which are capable of transmitting ground water. These deposits may be more than a thousand feet thick in the southern part of the Upper San Pedro drainage basin, where Basin and Range type faulting has produced a deep graben structure allowing extremely thick deposits of sedimentary deposits to accumulate. The hydrostratigraphic units of importance in the study area are the lower and upper units of the basin fill, and the overlying floodplain deposits. These units form the regional and local aquifers, respectively.

The lower unit of the basin fill consists of interbedded sandstone and gravel that ranges in thickness from 250-500 ft. Gravels within this unit locally contain much silt and other fine-grained sediments; thus decreasing permeability in some

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Table 5
Field Sampling and Survey Locations
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Well Name	Legal Description		Distance From River
Hereford 1	T.23S., R.22E., Sec. 10	NESENE	128'
Hereford 2	T.23S., R.22E., Sec. 9	SWSESE	360'
Cottonwood 1	T.22S., R.22E., Sec. 17	SWSWNE	58'
Lewis Spring	T.21S., R.21E., Sec. 31	SESESE	242'
Boquillas 3	T.20S., R.22E., Sec. 22	SENENW	129'
Boquillas 2	T.20S., R.22E., Sec. 22	SENENW	178'
Boquillas 1	T.20S., R.22E., Sec. 15	SENWSE	139'
Contention	T.19S., R.21E., Sec. 21	NENESW	131'
Summers	T.19S., R.21E., Sec. 8	SWNESE	156'
Diversion Dam	T.19S., R.21E., Sec. 4	SESWSW	305'

Source: Safford District

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zones. The upper basin fill overlies the lower basin fill, and consists of reddishbrown clayey and silty gravel beds near the mountains, changing laterally basin-ward into a more silty and sandy facies. The upper and lower basin fill behave as one hydrogeologic unit. Vertical and horizontal facies changes within these units result in a very heterogeneous system. This diminishes any hydrologic differences that might exist between the two units.

The floodplain alluvium consists of unconsolidated gravel, sand and silt derived from erosion of the surrounding pediment gravels and mountains and hills on either side of the San Pedro River. These alluvial deposits are about ¼ to 1½ miles wide, and are exposed along the San Pedro River and its major tributaries, such as the Babocomari River. The floodplain aquifer supplies shallow ground water to wells, and provides water to the San Pedro River. The flood plain aquifer is a thin unit; as thin as 10 ft. in some areas, and reaching a maximum thickness of perhaps 150 ft. Because of the unconsolidated character of this unit, its permeability is high, and water withdrawal by wells is rapidly replaced by recharge from infiltration of streamflow during periods of runoff. Most of the irrigation wells in the valley obtain water from this unit.

Artesian aquifers occur at both the north and south ends of the study area; in the Palominas-Hereford area (south of the study area), artesian conditions exist in zone about 1 mile wide and 10 miles long. In this area, beds of older alluvium contain at least seven sand and gravel members which are all overlain by confining clay beds which produce the artesian conditions. Further north, in the St. David area, artesian conditions exist over a larger area. In this area, there are actually two artesian zones. One zone is about 250 feet deep, and the other about 500 to 1,400 feet deep. The study area is primarily under unconfined (water table) conditions, and water freely moves into, or out of the San Pedro River, depending on the water level within the flood plain aquifer.

Perched aquifers are found locally within the basin fill aquifer. The ground water gradient along this section is 311 ft/mile, which is much too steep to be consistent with the regional ground water gradient, which is more on the order of 16 ft/mile. Perched aquifers are sufficient to provide water wells with limited yields, several ranches in the San Pedro Basin are supplied with water from these sources. Perched aquifers may be more common in this area than once surmised. Certainly the interbedded clay deposits which are common in this hydrogeologic setting, provides the framework for the existence of perched aquifers.

Ground Water/Streamflow Relationships

The saturated basin fill is an integral part of the ground water/streamflow regime in the Upper San Pedro Basin. Ground water contributes flow to the San Pedro River from two sources: (1) by contributions of

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flow from the basin fill, and (2) contribution from underflow within the floodplain aquifer which originates in the watershed in Mexico.

Groundwater recharge to the basin fill occurs in two ways: (1) percolation into the sediments along the mountain fronts, and (2) infiltration of precipitation into the flood plain aquifer from gullies and washes that have incised into the porous sediments of the floodplain aquifer. Ground water moves downgradient from the mountain fronts toward the San Pedro River which is the discharge point for most of the ground water system. Here the ground water flows into the San Pedro river channel and maintains its flow. Where artesian conditions exist, water is discharged to the San Pedro River from the basin fill via vertical leakage upward through overlying confining beds of clay and silty clay. This contribution to the flow of the San Pedro River is very minimal, because the hydraulic characteristics of the bedded sedimentary deposits such as those that are found here. The hydraulic conductivity of these deposits in the vertical plane is generally much lower than that horizontally, where water can easily flow laterally through very permeable gravel lenses. Movement of ground water vertically is severely limited by the intervening clay layers; flow across these layers is a function of how discontinuous or fractured they are.

Ground Water in the Riparian Zone

The riparian zone is part of the flood plain aquifer. The sediments of the floodplain aquifer are generally very porous, and water is easily transmitted through the gravel and sand of this unit. Permeability is considered to be much higher in the floodplain sediments than in the basin fill deposits.

At the outset of the DSC study, it was not known at what depth the ground water existed within the floodplain aquifer on the San Pedro River. Very little research is available in the literature on specific studies of riparian ground water relationships. The ground water regime of the riparian zone and its relationship to the basin ground water system must be evaluated. The impact of nearby pumping for irrigation and for domestic and municipal water supplies are also of interest.

In order to evaluate and document the existence of ground water within the riparian zone, a total of 11 well points were installed along the river within the floodplain sediments between Hereford and St. David. Well points are an easy and inexpensive way to evaluate shallow ground water. Locations were selected which would provide ground water information to complement streamflow measurements and the geomorphic crosssections of the river bed. Well points were installed at locations close to the river as well as at a considerable distance away, at the edge of the riparian zone. The well point locations ranged from 58 to 1060 ft. from the river. Some well points were driven by hand into the floodplain aquifer, and some were installed into auger holes drilled for this purpose.

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The well points were constructed of low carbon steel, having continuous slot, wire wound design, with a slot opening of .010 in. This design allows the unimpeded flow of water from the floodplain sediments into the well, and is an excellent method where sediments are soft. Because of the efficient design and large open area per foot of screen, they are useful in areas where the permeability may be low.

Ground water was found at each installed well point. Only one well point location was unsuccessful; this was because the well point encountered shallow bedrock which prevented penetration into the water table.

Ground water is flowing throughout the riparian zone, as demonstrated by the existence of ground water in each of the well points. Water was encountered at or near the river level in all cases, due to the water table being almost flat within the riparian zone. The depth to water in the well points ranged from 5.13 to 15.50 ft. below land surface. The floodplain sediments are saturated throughout their extent, providing water to riparian vegetation even at the most distant locations from the river, where very mature cottonwoods are established.

The existence of ground water throughout sediments in the riparian zone is consistent with the hydrogeologic framework of the flow system. Ground water flow in the basin-fill aquifer is toward the San Pedro River, and riparian zone, driven by the hydraulic gradient which has the river as its low-point. Evaluation of water levels in wells in the basin fill on both the west and east sides of the San Pedro River shows that ground water exists within the upper basin fill, at an elevation which is higher than the river. Thus, the ground water gradient is driving water laterally within the upper basin fill toward the river, draining into the floodplain aquifer, through direct hydraulic connection. Construction of a flow net based on water level contours of the basin fill aquifer, show the movement of ground water from the basin fill aquifer to the San Pedro River. Because of the high hydraulic conductivity of the floodplain sediments, water flows easily into these sediments from the basin fill aquifer.

Water levels in the floodplain aquifer respond rapidly to changes in stage of the San Pedro River. During periods of high flow, the stream recharges the floodplain aquifer, and during periods of high flow, the floodplain aquifer contributes water to the river, maintaining the base flow of the river. However, because of the very high permeability of the floodplain sediments, the flood flows rapidly dissipate, and the river returns to base flow within a few days. The floodplain aquifer does not store large amounts of water which is then available to sustain a higher base flow for any length of time. The thickness of deposits is not sufficient to store large amounts of ground water. The river base flow is quickly returned to the pre-flooding level. Most of the water from floods travels downstream either

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in the watercourse, or as underflow within the sediments of the floodplain aquifer.

Analysis of Floodplain Well Data

Floodplain well data were analyzed to determine: 1) the depth to groundwater within the riparian zone; 2) seasonal variations in riparian zone groundwater elevations; and 3) correlations (if any) between riparian one groundwater elevations and streamflow. In addition, data from selected wells in the floodplain aquifer were analyzed to determine if any trends existed over time in groundwater elevations and if changes in groundwater elevation might correspond to changes in either mean monthly flow or to be base flows (defined as the 90-day annual low flow).

The analysis of well data is hindered by the short period of record available for the BLM-riparian zone observation wells, and by both the short periods of record and the erratic frequency of records (especially when compared to surface flow records) available for deeper wells in the floodplain aquifer. The short period of record makes trend analyses difficult. The erratic and intermittent frequency of data makes correlations with streamflow difficult to detect. In addition, the storage capacity of the floodplain aquifer makes it effective in buffering abrupt changes in streamflows, another factor which confounds relationships between stream discharges and water table elevations.

BLM Riparian Monitoring Wells

Since the installation, the monitoring wells and stream flow have been measured on a regular time schedule - twice a month for the flow and three times a month for the wells. The data has been submitted to DSC for analysis. The measurements of the groundwater and streamflow will continue for at least several years on a similar schedule, as discussed above.

As described above, all of the monitoring wells encountered the water table at approximately the same elevation as the stream water surface. During the February dormant vegetation season, small groundwater gradients toward the stream existed. These gradients support the notion that lateral inflows from the regional aquifer play an important, and measurable, role in maintaining base flows. As vegetation began to utilize water in March and April, riparian water tables began to decline and continued to decline until the late summer rains. These declines corresponded to general declines in streamflow. With the first storms, the water table quickly recovered. The depth to groundwater between wells varied, of course, depending upon the geomorphic position of the wells. Continued monitoring of well water elevations will be required to develop annual patterns of groundwater elevation change. The current data are too sparse to show any long-term trend, but the mechanisms of water use in the riparian zone is emerging.

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Water Sources Inventory

To date, 28 wells have been located, inventoried, and mapped within the originally acquired lands. Two of the wells are unusable and two were installed by the Bureau of Reclamation for groundwater monitoring purposes. Eight wells are currently in use and the rest could be put into operation with the installation of pumping equipment or a power source and some maintenance. Ten of the wells supply water for irrigation; one is used for an industrial operation; four furnish water for domestic use and the rest have been or are being used for livestock watering. Most of the irrigation equipment is still in place. Where depth-to-water can be measured, the depth ranged between 12 to 35 feet. These measurements include several of the irrigation wells.

The eight springs and three ponds have also been inventoried and mapped. Those sources were described earlier in this section.

Since the acquisition of the original San Pedro lands, additional lands have been acquired and included within the boundaries since late 1987. Any existing water sources on the additional lands have not been inventoried to date. The inventory phase will continue until all sources are located and mapped. There are a number of wells and several stockponds known to exist on the recently acquired lands.

3. Water Quality

The quality of the surface water is generally considered good. Over the years, water quality of flow in the river has been measured by a number of entities (U.S. Geological Survey, Arizona Department of Health Services, Arizona Game and Fish Department, Arizona Governments Organization, U.S. Fish and Wildlife Service, and Gray Action Triangle Group), usually in response to the many pollution spills that have occurred in the upper watershed. Spills usually occur when intense rainstorms cause the holding ponds, for sewage or mining wastes, to overflow or breach. On occasion, the sewage and/or mining wastes may have been intentionally, or accidentally released, usually to create more storage capacity.

In December of 1978, an intense storm caused breaching of the holding ponds at the Cananea mining complex. The spill released highly acidic mining waste that extensively poisoned the entire length of the San Pedro River, to the confluence with the Gila River at Winkelman. The river was declared void of most, if not all, living organisms. One year after the disastrous spill, Southeastern Arizona Governments Organization (SEAGO), in cooperation with the Arizona Department of Health Services (ADHS), initiated water quality measurement of the river flow and of a number of selected wells located adjacent to the river. The area of measurement included the section of the river from Palominas to Winkelman. The measurements were taken monthly over a period of one year. A number of chemical and biological parameters, including heavy metals, were analyzed. A report was prepared in 1981. Although a number of

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smaller mining-related spills have been detected over the intervening years, the river system has fully recovered, and is considered relatively healthy.

Recovery from the 1979 event was surprisingly rapid. Invertebrates, fish (longfin dace), and acceptable water quality all were recorded four months after the mine spill subsided. According to Eberhardt (1981) problems associated with the event were corrected at the Cananea Mine.

Another water quality problem is the high suspended sediment load carried by the river during and after high intensity or long duration storms. This sediment load is largely derived from the on-going erosion of the surrounding desert lands. Some sediments are introduced into the river from returned irrigation waters and from industrial operations working on or adjacent to the river. The mean annual sediment discharge range between 0.5 to 1.0 acre-feet per square mile/per year.

On occasion, large amounts of organic materials have been observed floating down the main river, usually after high-intensity storms. Green Brush Draw is usually the suspected source of sewage-polluted water. This pollution may come from overloaded or breached sewage holding ponds in the vicinity of the headwaters.

During Fiscal Year 1987, Geological Survey re-established a water quality monitoring station at the Charleston stream gaging site. They will periodically collect samples for analysis of a number of biological and chemical parameters. This monitoring is expected to continue for several years, if funding is available. The Bureau will participate in this effort by providing partial funding each year.

Personnel from the ADHS continue to collect water quality data along the segment of the river between Palominas and St. David. They collect the data on a bi-monthly schedule. Their data is entered into the Environmental Protection Agency's Computerized Management System which establishes a water quality data base. Their data is also entered into the Arizona Department of Environmental Quality agency's water data base.

During mid-1986, the District initiated a water quality program for the area. Water quality was measured for streamflow, and several wells and springs. The District contracted with a State-approved laboratory to analyze water samples for 23 biological and chemical parameters. In July, samples were collected from the two wells at the Fairbank Administrative Site and submitted to the laboratory. The analysis was undertaken to ensure the suitability of the water for human consumption when the administrative site became operational. In August, samples were collected from four sites on the main channel and from one on the Babocomari River. In September, samples were taken from two sites on the main river. The results of the above analyses are given in the appendix. For the samples collected on the river in August, only copper, lead, iron, and manganese exceeded established standards, by wide margins. The

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September samples were well within established limits. The samples from the wells were within the accepted standards.

During Fiscal Year 1987 the District collected additional data at most of the springs and from selected sites on the river at intermittent intervals. See the Attachment 3 for information on the District's data collection.

4. Water Rights

The Huachuca Audubon Society submitted an "Application for Permit to Appropriate Surface Water" to the Arizona Department of Water Resources in August of 1985 to acquire an instream flow water right. The water right was requested for the segment of the San Pedro River from Hereford to Benson. After the Bureau took ownership of the lands, the instream flow water right was reassigned to the Bureau. Because the river system is extremely important to the management of the lands, the Bureau will exert every effort to perfect an appropriate water right.

The San Pedro Watershed is currently undergoing an adjudication proceedings under the direction of the courts and with guidance from the Department of Water Resources. These proceedings will consider all submitted water claims and determine the apportionment of the existing water resources.

The Denver Service Center's report for the San Pedro acquired lands recommended specific quantities of flow for each month. Those quantities were based on a percentage of the median daily flows for each month of the year. Flows were recommended from the Palominas and Charleston/Tombstone gaging stations. See Table 6 for the recommended instream flows. Please refer to the DSC report for the explanation of the recommended quantities of flow.

The St. David Irrigation District's water right for the diversion dam dates back to the 1890's. The diversion of water which is located on the northern end of the lands, has averaged 500 acre-feet per month during the irrigation season. There is no other appropriation of surface water on the segment of the river south of St. David, other than this diversion.

Of the 28 water-supply wells inventoried to date, the ownership of 21 wells has been reassigned to the Safford District. The District is waiting for the remaining assignment forms from the previous owners. The Certificate of Water Rights for each of the eight springs have been reassigned by the former owners.

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TABLE 6

Recommended Instream Flows for the BLM San Pedro River Properties

BUREAU OF LAND MANAGEMENT

Safford District, Arizona

Period	Month	Flow Recommendation, cfs	
		Palominas	Charleston/ Tombstone
Fall	Oct.	3.7	11.0
	Nov.	3.6	12.2
Winter	Dec.	5.5**	17.1**
	Jan.	7.2**	19.5**
	Feb.	8.6**	20.3**
	Mar.	6.3**	18.9**
Spring	April	2.5	12.2
	May	1.2	7.9
	June	0.6	4.2
Summer	July	7.0*	19.0*
	August	7.0*	19.0*
	Sept.	7.0*	19.0*

Source: BLM, Denver Service Center

* This value or 60% of the instantaneous flow, whichever is greater.

** This value or 80% of the instantaneous flow, whichever is greater.

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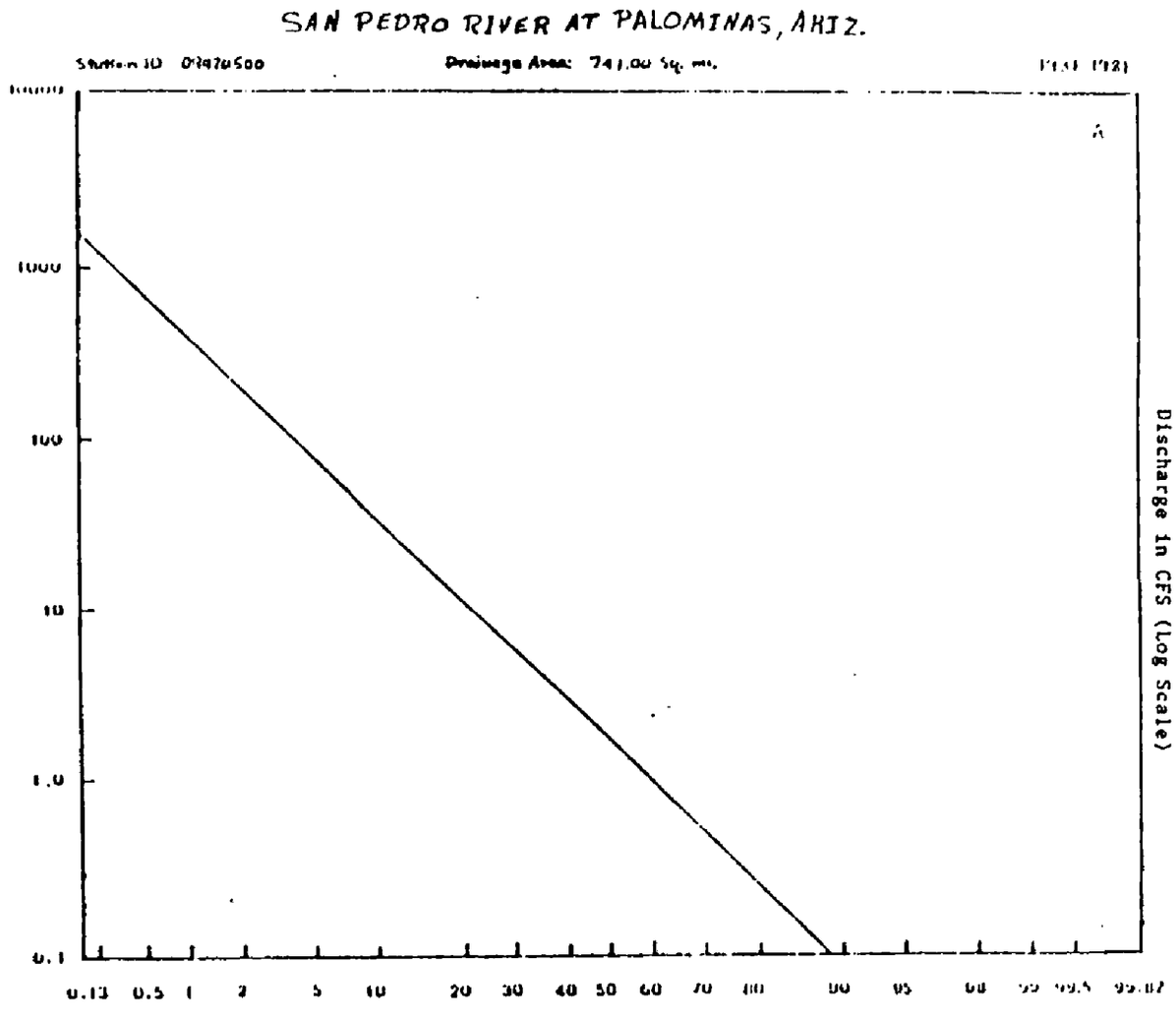

ATTACHMENT 1

Figure 22. Annual mean daily flow-duration curves for the San Pedro River at (a) Palominas, (b) Charleston, and (c) Tombstone.

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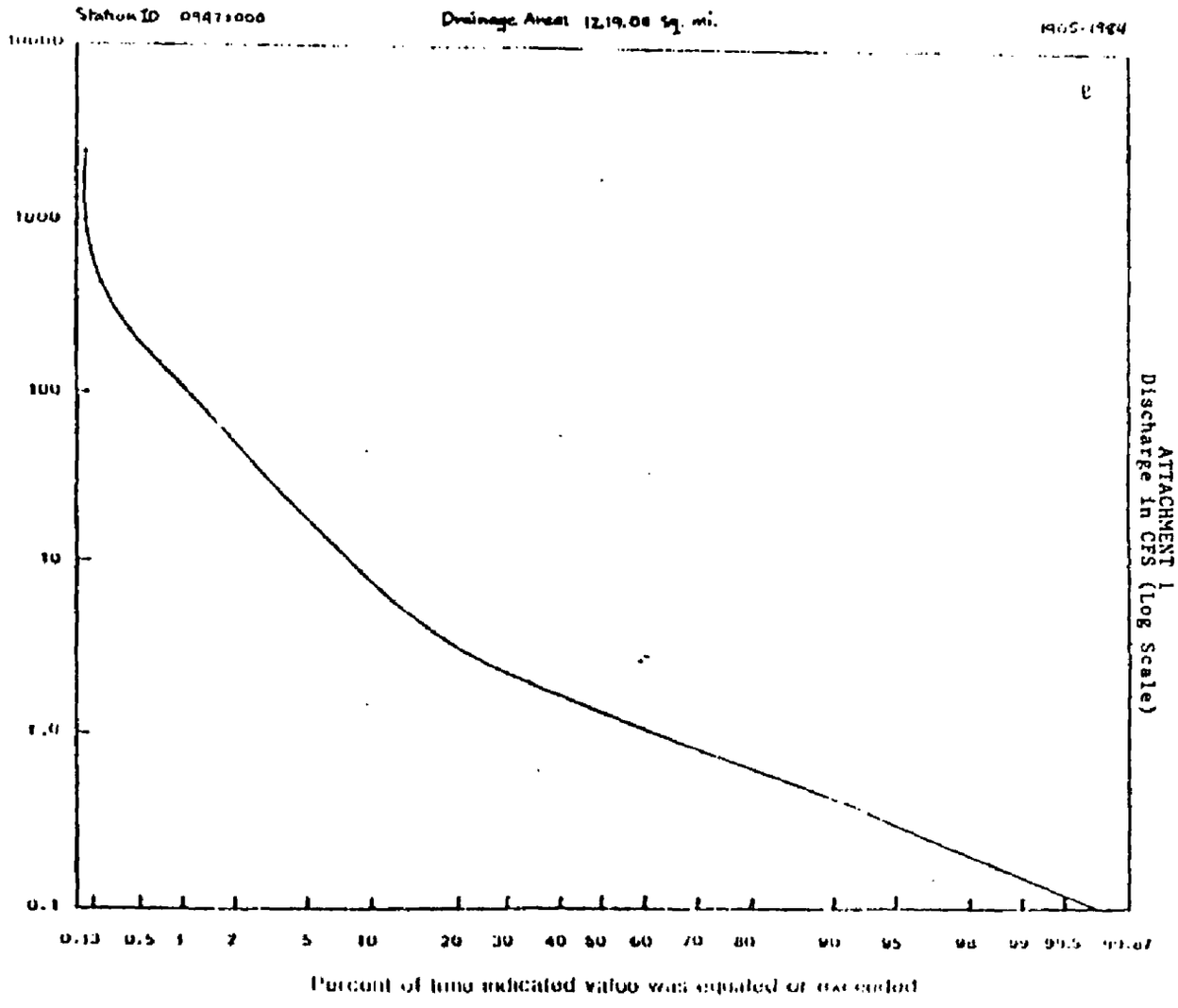
SAN PEDRO RIVER AT CHARLESTON, ARIZ.



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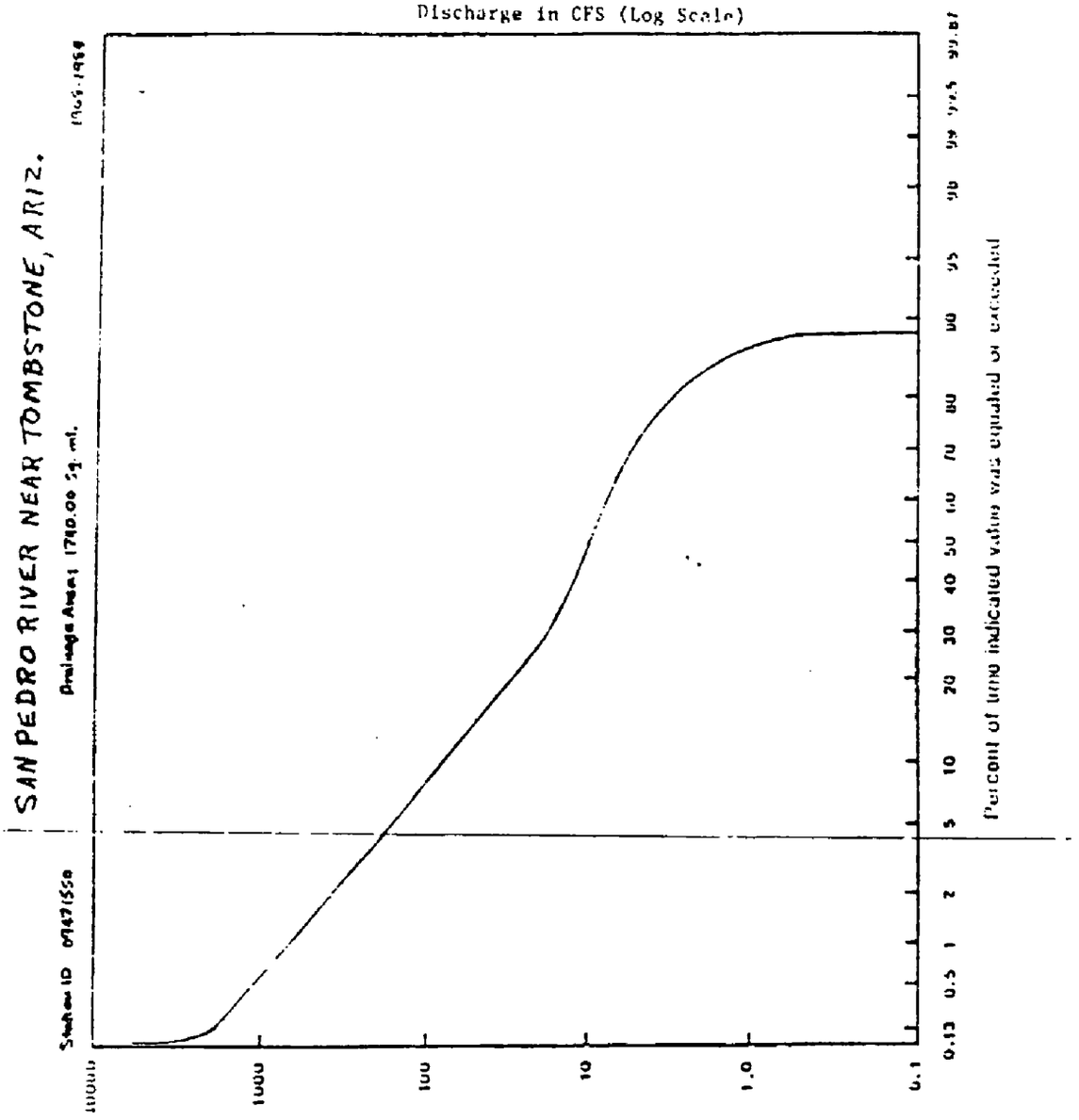
ATTACHMENT 1



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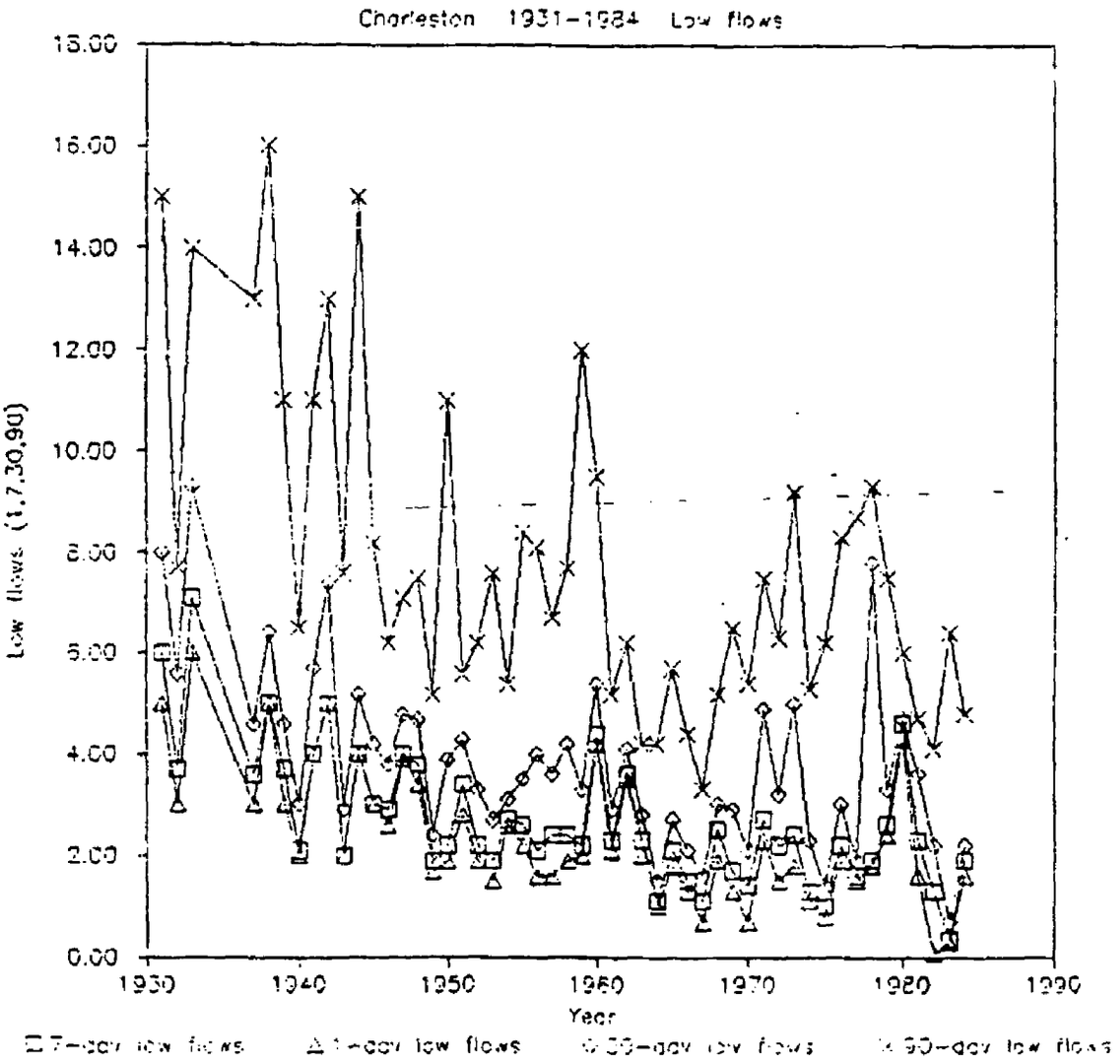
ATTACHMENT 2

Figure 26. 1-day, 7-day, 30-day, and 90-day low flows for the San Pedro River at Charleston, 1931-1984.



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ATTACHMENT 2

flow = 128.28 - 0.06 * year
r^2 = 0.30
significance of slope = 0.99
mean = 3.84 cfs
standard deviation = 1.77 cfs

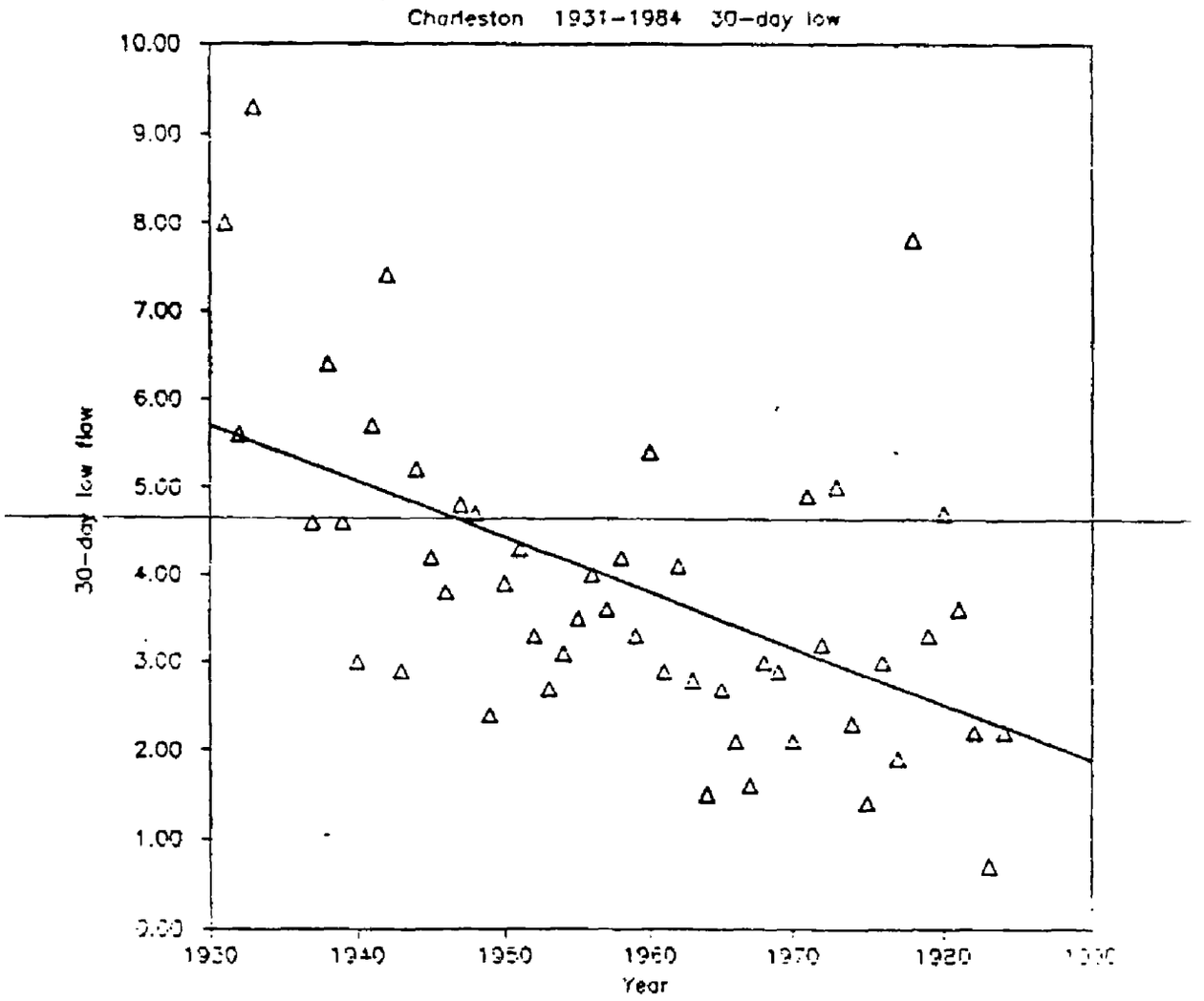

Figure 27. Trend in 30-day low flow for the San Pedro River at Charleston, 1931-1984.

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ATTACHMENT 2

flow = 63.47 - 0.03 * year
r^2 = 0.48
significance of slope = 0.99
mean = 0.35 cfs
standard deviation = 0.65 cfs

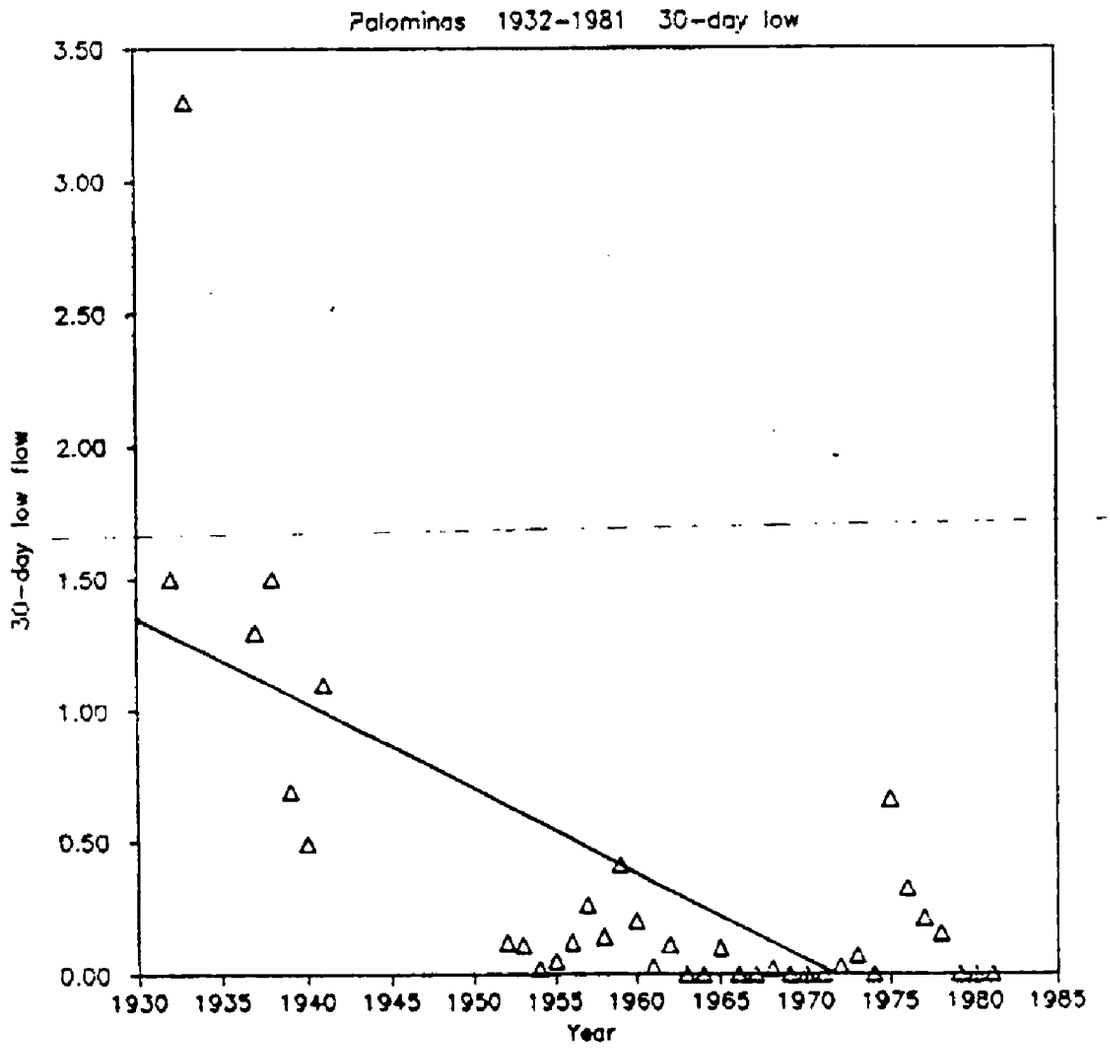

Figure 28. Trend in 30-day low flow for the San Pedro River at Palominas, 1932-1981.

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Attachment 3

San Pedro River Water Quality Analysis, 1986
Safford District, Arizona

Dates	08/20					09/23		11/19	
Sample Types	Above Green Brush Draw	Hgwy. 90	Charleston Bridge	Babocomari River	Fairbank Bridge	Above Green Brush Draw	Summers Well	Above Green Brush Draw	Standard
Flow CFS	35 est.	38 est.	55 est.	2.5 est.	75 est.	3.8	4.3	7.8	---
pH Field	---	---	---	---	---	8.3	8.1	8.1	
Lab	7.6	7.9	8.0	8.0	8.0	8.1	7.9	---	9.0 Max.
Total Susp. Solids	272	256	292	30	410	6	1	---	---
Hardness	181.0	173.0	154.6	145.5	149.7	215.0	184.6	---	---
Total Dissol. Solids	152	165	165	268	165	388	344	---	500.0 mg/L
Sulfate	100.5	128	85.5	29.9	120	102.9	85.5	---	250.0 mg/L
Copper	0.262	0.26	0.09	0.06	ND	0.03	0.02	---	0.05 mg/L
Manganese	0.084	ND	ND	ND	0.25	0.01	0.02	---	0.05 mg/L
Arsenic	0.006	0.008	0.006	ND	0.008	ND	ND	---	0.05 mg/L
Cadium	0.032	ND	ND	ND	ND	ND	ND	---	0.01 mg/L
Chromium	0.019	0.024	0.018	0.04	0.003	0.03	0.03	---	0.05 mg/L
Lead	0.040	0.141	0.15	0.174	ND	ND	ND	---	0.05 mg/L
Selenium	ND	ND	ND	ND	ND	ND	ND	---	0.01 mg/L
Silver	ND	ND	ND	ND	ND	ND	ND	---	0.05 mg/L
Zinc	1.88	ND	ND	ND	0.11	0.006	ND	---	5.0 mg/L
Iron	4.10	0.301	0.60	.70	13.0	ND	0.008	---	0.3 mg/L
Mercury	ND	ND	ND	ND	ND	0.004	ND	---	.002 mg/L
Chloride	4.2	3.0	2.3	6.7	2.6	8.1	7.4	---	250 mg/L
Phosphates	15	5	15	2	16	180	10.5	---	---
Nitrates	1.5	1.0	1.3	0.22	1.5	0.52	ND	---	10 mg/L
									Potable 0/100 ml
Fecal Coliform	540	220	350	140	540	180	22	---	FBC 1000/100 m
Conductivity									
Field	460	410	390	390	350	490	490	345	---
Lab	381	351	323	327	300	346	366	---	---
Chlorin Herbicide	ND	ND	---	ND	ND	ND	Trace Silvex	---	---
Chlorin Pesticide	ND	ND	---	ND	ND	ND	ND	---	---
Organophosphates	ND	ND	---	ND	ND	ND	ND	---	---

ND - Not Detected *MPN/100 ml

Lab Analysis performed by American Analytical Laboratories, Tucson, Arizona. All measurements taken on San Pedro River except Babocomari and springs.

FCSPRNCA1002

ATTACHMENT 3 (contd.)
San Pedro River Water Quality Analysis, 1986-87
Safford District

Dates	11/19	01/06	01/06	01/06	01/08	01/08	01/14	01/14
Sample type	Above Green Brush Draw	Here-ford Bridge	Hgwy. 90	Charleston Hills	Tombstone Gage	Charleston Bridge	Summers Well	Diversion Dam
Flow, CFS	7.8	13.6	17.7	21.0	12.4	19.4	---	---
pH Field	8.1	8.6	8.6	8.6	8.8	8.8	8.1	8.7
pH Lab	---	---	---	---	---	---	---	---
Conductivity Field	540	500	500	410	490	510	320	500
Alkalinity (Hach Kit)	---	240	220	200	200	200	160	180
Dissolved Oxygen (Hach Kit)	---	12	12	11	10	12	---	9

All measurements taken on San Pedro River except Babocomari and springs.

FCSPRNCA1003

ATTACHMENT 3 (contd.)
San Pedro River Water Quality Analysis, 1987
Safford District

Dates / Sample type	01/15 Diversion Dam	01/15 Little Joe Spring	10/15 Summer Well	10/14 Fairbank Bridge	10/14 Charleston Bridge	10/14 Hgwy. 90	10/14 Hereford Bridge	10/14 Hgwy. 92	Standard
Flow, CFS	---	---	1.2	4.6	7.4	3.3	2.4	0.1	---
pH Field	8.7	7.7	8.0	8.5	8.5	8.4	8.0	8.0	---
Turbidity Hardness (Hach Kit)	180	260	---	---	---	---	---	---	---
Conductivity Field	500	920	500	450	420	510	560	590	---
Alkalinity (Hach Kit)	180	140	---	---	---	---	---	---	---
Dissolved Oxygen (Hach Kit)	9	---	---	---	---	---	---	---	---

ND - Not Detected
*MPN/100 ml

Lab Analysis performed by American Analytical Laboratories, Tucson, Arizona. All measurements taken on San Pedro River except Babocomari and springs.

FCSPRNCA1004

ATTACHMENT 3 (contd.)
San Pedro River Water Quality Analysis, 1987
Safford District

Dates	10/14	11/02	11/02	11/13	11/13/
Sites	Babocomari	Lewis	Lewis	2 Cienega	Little
Sample Type	River	Spring (S)	Spring (N)	Spring	Joe Spring
Flow, CFS	0.1	0.1	0.6	0.1	0.1
pH Field	8.7	7.6	5.3	8.0	7.4
Conductivity Field	450	630	600	910	1000

FCSPRNCA1005

ATTACHMENT 3 (contd.)
San Pedro Water Quality Analysis, March 1987
by Gray Triangle Action Group

	Hereford Road	Highway 90	Private Well*	Standard (MCL)
Arsenic	0.02	0.02	0.02	0.05
Barium	0.11	0.11	0.1	1.0
Cadmium	0.005	0.005	0.005	0.01
Chromium	0.02	0.02	0.02	0.02
Fluoride	0.4	0.3	0.2	1.4-2.0
Lead	0.02	0.02	0.02	0.05
Mercury	0.001	0.001	0.001	0.002
Nitrates	0.8	0.4	0.2	10.0
Selinium	0.01	0.01	0.01	0.01
Silver	0.02	0.02	0.02	0.05
Alkalinity	188	180	145	---
Calcium	75	72	45	---
Chloride	9	8	2	---
Copper	0.05	0.05	0.05	---
Hardness	223	221	129	---
Iron	0.2	0.3	0.1	---
Magnesium	11	10	4	---
Manganese	0.05	0.05	0.05	---
pH	8.2	8.1	8.2	---
Sodium	41	40	10	---
Sulfate	81	84	5	---
TDS	324	330	154	---
Zinc	0.05	0.05	0.05	---
Cyanide	0.05	0.05	0.05	---

*North of Ramsey Road and E of Moson Road. Approx. 1 mi. from river.
Source: Safford District

FCSPRNCA1006

APPENDIX 6
Species List - Birds
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Terrestrial Wildlife Species	Vegetation Communities* 1	2	3	4	5	6	7	8	9	10	11	12	Other
Least Grebe													X
Pied-billed Grebe									X				
Eared Grebe													X
Double-crested Comorant													X
Olivaceous Comorant													X
American Bittern									X				
Least Bittern									X				
Great Blue Heron									X				X
Great Egret													X
Snowy Egret													X
Little Blue Heron													X
Cattle Egret													X
Green-backed Heron									X				
Black-crowned Night Heron									X				
White-faced Ibis													X
Black-bellied Whistling Duck									X				X
Greater White-fronted Goose													X
Snow Goose													X
Ross' Goose													X
Canada Goose													X
Wood Duck									X				
Green-winged Teal									X				
Mallard									X				
Northern Pintail									X				
Blue-winged Teal													X

Source: District Files

*
1 Creosote-tarbush
2 Mixed Grassland-Whitethorn
3 Sacaton-Grassland Mixed Shrub
4 Mesquite-Mixed Shrub Association
5 Upland Scrub Grassland
6 Bottomland Scrub Grassland
7 Disclimax Grassland
8 Chihuahuan Desert Scrub
9 Cottonwood-willow Riparian
10 Mesquite Bosque
11 Salt Cedar Bosque
12 Cienega

FCSPRNCA1007

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Cinnamon Teal									X				
Northern Shoveler									X				
Gadwall									X				X
American Wigeon									X				X
Canvasback													
Redhead													X
Ring-necked Duck													X
Lesser Scaup													X
Common Goldeneye													
Bufflehead													X
Common Merganser									X				X
Red-breasted Merganser									X				X
Ruddy Duck													X
Turkey Vulture	X	X	X	X	X	X	X	X	X	X	X		
Black-shouldered Kite						X						X	
Mississippi Kite													
Sharp-shinned Hawk									X	X			
Cooper's Hawk									X	X			
Red-tailed Hawk	X	X	X	X	X	X	X	X	X	X	X	X	X
Swainson's Hawk		X	X		X	X			X				
Zone-tailed hawk									X				
Rough-legged Hawk						X	X						
Ferruginous Hawk						X	X						
Gray Hawk									X				
Harris' Hawk									X				
Black Hawk									X				
Great Black Hawk									X				
Bald Eagle													X
Golden Eagle	X				X			X					
Northern Harrier	X	X	X	X	X	X	X	X		X			X
Osprey													
Crested Caracara						X			X				X
Peregrine Falcon				X					X				X
Prairie Falcon	X	X	X	X	X			X					
Aplomado Falcon			X										
Merlin	X								X	X			
American Kestrel				X	X	X			X				
Broad-winged Hawk									X				

FCSPRNCA1008

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Scaled Quail		X	X					8					
Gambel's Quail			X	X			X		X				
Montezuma Quail									X				
Wild Turkey													
Sandhill Crane						X							
Virginia Rail												X	
Sora												X	
Purple Gallinule													X
Common Moorhen									X				X
American Coot									X				
Semipalmated Plover													X
Killdeer									X				X
Greater Yellowlegs									X				X
Lesser Yellowlegs									X				X
Solitary Sandpiper													X
Willet													X
Spotted Sandpiper									X				X
Long-billed Curlew						X							X
Marbled Godwit													X
Semipalmated Sandpiper													X
Western Sandpiper									X				X
Least Sandpiper									X				X
Baird's Sandpiper													X
Pectoral Sandpiper													X
Stilt Sandpiper													X
Short-billed Dowitcher													X
Long-billed Dowitcher													X
Common Snipe									X				X
Black-necked Stilt													X
American Avocet													xX
Wilson's Phalarope													X
Red-necked Phalarope													X
Ring-billed Gull													X
Franklin's Gull													X
Forster's Tern													X
Black Tern													X
Bonaparte's Gull													X
Rock Dove													X
White-winged Dove									X	X	X		
Mourning Dove	X	X	X	X	X	X	X	X	X	X	X		
Inca Dove													X
Common Ground Dove									X				

FCSPRNCA1009

Terrestrial Wildlife Species	Vegetation Communities* 1	2	3	4	5	6	7	8	9	10	11	12	Other
Yellow-billed Cuckoo									X				
Greater Roadrunner	X	X	X		X			X		X			
Common Barn Owl									X				
Flammulated Owl													X
Western Screech Owl									X	X			
Great Horned Owl									X	X			
Elf Owl										X			
Burrowing Owl													X
Long-eared Owl									X				
Short-eared Owl													X
Lesser Nighthawk	X	X	X	X	X	X	X		X				
Common Nighthawk	X							X					
Common Poorwill	X				X			X					
Whip-poor-will									X				
Vaux's Swift	X							X					X
White-throated Swift													X
Broad-billed Hummingbird										X			X
Plain-capped Starthroat									X				
Black-chinned Hummingbird				X					X	X	X		X
Anna's Hummingbird									X				X
Costa's Hummingbird													X
Calliope Hummingbird									X				X
Broad-tailed Hummingbird									X				X
Rufous Hummingbird									X				X
Allen's Hummingbird									X				X
Elegant Trogon									X				
Belted Kingfisher									X				
Green Kingfisher									X				
Acorn Woodpecker									X				
Gila Woodpecker				X					X	X			
Yellow-bellied Sapsucker									X				
Rad-naped Woodpecker									X				
Ladder-backed Woodpecker				X					X	X			
Hairy Woodpecker									X				
Northern Flicker									X	X	X		
Olive-sided Flycatcher									X				
Greater Peewee									X				
Western Wood-Peewee									X				
Willow Flycatcher									X				
Least Flycatcher									X				
Hammond's Flycatcher									X				

FCSPRNCA1010

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Dusky Flycatcher									X				
Grey Flycatcher				X					X	X			
Wastern Flycatcher									X				
Black Phoebe									X				
Eastern Phoebe									X				
Say's Phoebe	X	X	X	X	X	X	X	X	X	X	X		
Vermilion Flycatcher									X				X
Dusky-capped Flycatcher									X				
Ash-throated Flycatcher				X					X	X			
Brown-crested Flycatcher									X				
Northern Beardless Tyrannulet									X				
Thick-billed Kingbird									X				
Tropical Kingbird									X				
Cassin's Kingbird									X	X			
Western Kingbird									X				
Horned Lark								X					
Purple Martin									X				
Tree Swallow									X				
Violet-green Swallow			X						X				
Northern Rough-winged Swallow			X						X				
Bank Swallow									X				X
Cliff Swallow									X				
Barn Swallow													X
Steller's Jay									X				
Scrub Jay	X								X	X			
Pinyon Jay													X
Chihuahuan Raven	X	X	X	X	X	X	X	X	X	X	X	X	
Common Raven	X	X	X	X	X	X	X	X		X	X	X	
Bridled Titmouse									X				
Bustit				X					X	X			
Verdin				X									
Red-breasted Nuthatch									X				
White-breasted Nutchatch									X				
Brown Creeper									X				
Cactus Wren				X					X	X			
Rock Wren	X			X				X					
Canyon Wren									X				X
Bewick's Wren	X	X	X	X	X	X	X	X	X	X	X		
House Wren									X	X			
Winter Wren									X				
Marsh Wren		X											X

FCSPRNCA1011

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Northern Mockingbird			X	X					X	X			
Sage Thrasher				X						X			
Brown Thrasher									X				
Bendire's Thrasher				X									
Curve-billed Thrasher				X	X	X	X		X	X			
Crissal Thrasher			X	X					X	X			
Gray Catbird									X				
Western Bluebird									X				X
Mountain Bluebird									X				X
Townsend's Solitaire									X				
Swainson's Thrush									X				
Hermit Thrush									X				
American Robin									X				
Eastern Bluebird									X				X
Blue-grey Gnatcatcher	X	X		X				X	X				
Golden-crowned Kinglet									X				
Ruby-crowned Kinglet									X				
Black-tailed Gnatcatcher	X	X		X				X		X			
Water Pipit									X				
Sprague's Pipit						X							
Cedar Waxwing									X				
Bohemian Waxwing									X				X
Phainopepla				X						X			
Loggerhead Shrike	X	X	X	X	X	X	X	X				X	X
European Starling									X				
Bell's Vireo									X	X			
Solitary Vireo									X				
Hutton's Vireo									X				
Warbling Vireo									X				
Philadephia Vireo									X				
Gray Vireo									X				
Hermit Warbler									X				
Tennessee Warbler									X				
Orange-crowned Warbler									X				
Nashville Warbler									X				
Virginia's Warbler									X				
Lucy's Warbler				X					X	X			
Northern Parula									X				
Yellow Warbler									X				
Black-throated Blue Warbler								X					
Townsend's Warbler									X				

FCSPRNCA1012

Terrestrial Wildlife Species	Vegetation Communities* 1	2	3	4	5	6	7	8	9	10	11	12	Other
Pine Warbler									X				
Yellow-rumped Warbler									X				
American Redstart									X				
Worm-eating Warbler									X				
Northern Water Thrush									X				
MacGillivray's Warbler				X					X	X			
Common Yellowthroat			X	X					X				
Wilson's Warbler									X				
Red-faced Warbler									X				
Painted Redstart									X				
Yellow-breasted Chat			X	X					X	X			
Black-throated Green Warbler									X				
Eastern Meadowlark		X	X		X	X						X	
Red-winged Blackbird									X			X	X
Yellow-headed Blackbird												X	X
Rusty Blackbird									X				
Brewer's Blackbird									X				X
Great-tailed Grackle													X
Bronzed Cowbird				X					X	X			
Brown-headed Cowbird		X	X	X	X	X	X	X	X	X	X	X	
Orchard Oriole													X
Hooded Oriole									X				
Northern Oriole			X	X		X				X	X		
Scott's Oriole				X	X	X				X			
Western Meadowlark	X	X			X		X	X					
American Crow									X				X
Hepatic Tanager									X				
Summer Tanager									X				
Scarlet Tanager									X				
Western Tanager									X				
Northern Cardinal				X					X	X			
Pyrrhuloxia				X						X			
Rose-breasted Grosbeak									X				
Black-headed Grosbeak									X				
Blue Grosbeak			X	X					X	X	X		
Lazuli Bunting			X	X					X				
Indigo Bunting			X	X					X	X			
Varied Bunting										X			
Painted Bunting									X				
Dickcissel						X							
Green-tailed Towhee		X	X	X	X	X			X	X	X		
Rufous-sided Towhee									X	X	X		
Brown Towhee				X					X	X			
Abert's Towhee									X	X	x		
Baird's Sparrow													X

FCSPRNCA1013

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Botteri's Sparrow			X			X							
Cassin's Sparrow			X			X							
Rufous-winged Sparrow													X
Rufous-crowned Sparrow	X		X			X							X
Chipping Sparrow				X					X	X			
Clay-colored Sparrow	X												X
Brewer's Sparrow		x	x	x	x	x			x	x			
Black-chinned Sparrow													
Vesper Sparrow						X			X				
Lark Sparrow						X							X
Black-throated Sparrow	X	X			X			X					
Sage Sparrow	X				X								
Lark Bunting					X	X							
Savannah Sparrow			X			X							
Grasshopper Sparrow			X			X							
Fox Sparrow			X						X				
Song Sparrow									X				
Lincoln's Sparrow				X					X	X			
Swamp Sparrow	X								X				
White-throated Sparrow									X	X			
Golden-crowned Sparrow													X
White-crowned Sparrow		X	X	X	X	X			X	X	X		
Harris Sparrow				X									X
Dark-eyed Junco									X	X			
McCown's Longspur						X							
Chestnut-collared Longspur						X							
Purple Finch													X
Cassin's Finch													X
House Finch	X	X	X	X	X	X		X	X	X	X		
Red Crossbill									X				
Pine Siskin									X				
Lesser Goldfinch									X	X		X	
Lawrence's Goldfinch						X			X			X	
American Goldfinch									X				X
House Sparrow													
Bobolink													X

Source: Safford District

FCSPRNCA1014

APPENDIX 7
Species List - Mammals
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Vagrant Shrew		X		X							X	X	
Desert Shrew			X						X	X			
Peter's Leaf-chinned Bat	X	X		X	X			X		X			
California Leaf-nosed Bat	X	X		X	X			X		X			
Sanborn's Long-nosed Bat	X	X		X	X			X		X			
Mexican Long-nosed Bat	X	X		X	X			X		X			
Yuma Myotis			X	X	X	X	X		X				
Cave Myotis	X	X		X	X			X	X				
Fringed Myotis	X	X	X	X	X	X		X		X			
Long-leagged Myotis					X				X				
Long-eared Myotis				X								X	
Silver-haired Bat		X	X		X	X			X			X	
Southwestern Myotis		X	X		X	X							
California Myotis	X	X	X	X	X			X		X			
Small-footed Myotis		X	X		X	X							
Western Pipistrelle	X	X	X	X	X	X	X	X	X	X	X		
Big Brown Bat	X	X	X	X	X	X							
Red Bat			X		X				X				
Hoary Bat						X			X	X			
Townsend's Big-eared Bat		X	X		X	X							
Pallid Bat	X	X	X	X	X	X	X	X	X	X			
Allen's Lappet-browed Bat		X	X		X	X							
Southern Yellow Bat	X	X	X	X	X	X	X	X		X			
Brazilian Free-tailed Bat	X	X	X	X	X	X		X	X	X			
Pocketed Free-tailed Bat			X		X		X						

Source: District Files

*
1 Creosote-tarbush
2 Mixed Grassland-Whitethorn
3 Sacaton-Grassland Mixed Shrub
4 Mesquite-Mixed Shrub Association
5 Upland Scrub Grassland
6 Bottomland Scrub Grassland
7 Disclimax Grassland
8 Chihuahuan Desert Scrub
9 Cottonwood-willow Riparian
10 Mesquite Bosque
11 Salt Cedar Bosque
12 Cienega

X = Occurs or expected to occur

FCSPRNCA1015

Terrestrial Wildlife Species	Vegetation Communities* 1	2	3	4	5	6	7	8	9	10	11	12	Other
Western Mastiff Bat									X				
Big Free-tailed Bat			X		X		X						
Spotted Bat									X	X			
Antelope Jackrabbit								X		X			
Black-tailed Jackrabbit	X	X		X	X		X	X					
Desert Cottontail		X	X	X	X	X			X	X			
Spotted Ground Squirrel					X								
Rock Squirrel					X								
Harris' Squirrel	X	X			X		X	X					
Round-tailed Ground Squirrel							X						
Black-tailed Prairie Dog						X							
Gunnison's Prairie Dog													
Botta's Pocket Gopher			X	X									
Silky Pocket Mouse							X						
Hispid Pocket Mouse												X	
Desert Pocket Mouse			X				X	X	X	X	X		
Rock Pocket Mouse					X								
Banner-tailed Kangeroo Rat					X								
Merriam's Kangeroo Rat	X												
Bailey's Pocket Mouse					X			X		X			
Ord's Kangaroo Rat			X		X		X	X					
Great Basin Pocket Mouse			X		X								
Beaver									X				
Northern Grasshopper Mouse			X				X	X					
Southern Grasshopper Mouse			X		X		X	X		X	X		
Plains Harvest Mouse			X				X					X	
Western Harvest Mouse			X		X	X		X	X	X	X	X	
Fulvous Harvest Mouse					X		X	X	X		X	X	
Northern Pigmy Mouse						X							
Cactus Mouse					X		X	X	X	X	X		
Deer Mouse	X		X	X	X	X	X	X	X	X	X	X	
White-footed Mouse			X			X	X	X	X	X	X	X	
Brush Mouse									X				
Fulvous Cotton Rat			X			X				X		X	
White-throated Woodrat	X		X		X		X	X	X	X	X	X	
Arizona Cotton Rat			X			X				X		X	
Porcupine						X			X	X			
House Mouse	X	X	X			X	X	X	X	X	X		

FCSPRNCA1016

Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Hispid Cotton Rat			X			X			X	X			
Yellow-nosed Cotton Rat					X							X	
Muskrat									X				
Coyote	X	X	X	X	X	X	X	X	X	X	X	X	
Kit Fox							X						
Gray Fox	X			X		X			X	X		X	
Ringtail Cat													
Raccoon										X	X	X	
Coati										X			
Long-tailed Weasel			X			X		X					
Badger	X	X	X	X	X	X	X	X	X	X	X		
Spotted Skunk			X		X	X			X	X			
Striped Skunk			X		X	X			X	X			
Hooded Skunk			X		X	X			X	X			
Hog-nosed Skunk									X				
Black Bear									X				
Mountain Lion					X				X				
Bobcat					X				X	X			
Collared Peccary			X	X		X			X	X			
Mule Deer		X	X	X	X	X			X				
White-tailed Deer						X			X				

FCSPRNCA1017

APPENDIX 8
Species List - Herptiles
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Terrestrial Wildlife Species	Vegetation Communities* 1	2	3	4	5	6	7	8	9	10	11	12	Other
Southern Spadefoot Toad	X	X	X	X	X		X	X		X			
Couch's Spadefoot Toad	X	X	X	X	X		X	X	X	X			
Southwestern Woodhouse's Toad	X	X	X	X	X	X	X	X	X	X			
Great Plains Toad		X			X		X						
Sonoran Desert Toad			X	X						X			
Red-spotted Toad				X					X	X			
Bullfrog		X										X	
Desert Box Turtle	X	X	X	X	X	X	X		X	X		X	
Sonoran Mud Turtle		X										X	
Texas Spiny Softshell		X											
Clark's Spiny Lizard									X				
Tucson Banded Gecko	X							X					
Southwestern Earless Lizard	X			X				X		X			
Zebra-tailed Lizard	X		X										
Large Spotted Leopard Lizard	X							X					
Twin-spotted Spiny Lizard	X			X				X		X			
Southern Prairie Lizard		X	X	X	X	X	X		X	X			
Tree Lizard	X			X				X	X	X			
Regal Horned Lizard	X			X				X		X			
Texas Horned Lizard	X			X				X		X			
Arizona Desert Whiptail	X			X				X		X			

Source: District Files

*
1 Creosote-tarbush
2 Mixed Grassland-Whitethorn
3 Sacaton-Grassland Mixed Shrub
4 Mesquite-Mixed Shrub Association
5 Upland Scrub Grassland
6 Bottomland Scrub Grassland
7 Disclimax Grassland
8 Chihuahuan Desert Scrub
9 Cottonwood-willow Riparian
10 Mesquite Bosque
11 Salt Cedar Bosque
12 Cienega

X = Occurs or expected to occur

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Terrestrial Wildlife Species	Vegetation Communities*												
	1	2	3	4	5	6	7	8	9	10	11	12	Other
Desert Grassland Whiptail	X	X	X	X	X	X	X	X	X	X	X	X	
Sonoran Spotted Whiptail									X				
Giant Spotted Whiptail				X						X			
Madrean Alligator Lizard									X				
Reticulate Gila Monster	X			X				X		X			
Regal Ringneck Snake									X				
Coachwhip	X	X	X	X	X	X	X	X	X	X			
Sonoran Mountain Whipsnake	X												
Big Bend Patch-nosed Snake	X	X		X	X		X	X		X			
Sonora Gopher Snake	X	X	X	X	X	X	X	X	X	X	X	X	
Desert Kingsnake	X							X					
Western Long-nosed Snake	X							X					
Checkered Garter Snake				X					X	X			
Northern Mexican Garter Snake									X				
Southwestern Black-headed Snake				X						X			
Night Snake		X		X	X		X			X			
Sonoran Lyre Snake	X							X					
Arizona Coral Snake				X						X			
Western Diamondback Rattlesnake	X	X	X	X	X	X	X	X	X	X			
Mojave Green Rattlesnake	X	X		X	X		X	X		X			

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APPENDIX 9

LAND GRANT OWNERS
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

San Juan de Las Boquillas y Nogales		San Rafael del Valle	
1827	Grant applied for by Capt. Ignacio Elias Gonzalez and Nepomucino Felix - $240.	1827	Grant applied for by Rafael Elias Gonzalez - $240.
1833	Title issued to Gonzalez and Felix.	1832	Title issued to Gonzalez. Grant left to his widow and three sons.
		1862	Mortgaged to Camou brothers.
		1869	Camou brothers acquired deed.
1880	Last of grant purchased by George Hill Howard. Transferred half to wife Janet G. Howard and half to George Hearst.		
1881	Transfer approval recommended.		
1889	George Hearst purchased J. Howard's half.	ca. 1901	Camou grant confirmed by U.S. for 17,474.93 acres.
1899	Phoebe (also Pheba) Hearst (George's widow) and son William Randolph Hearst petition to Court of Private Land Claims.	1905	Cornell Greene purchased grant.
		1912	After Greene's death, Greene Cattle Co. sold land to the Boquillas Land and Cattle Co.
1901	Patent issued to Hearsts. 17,355.86 acres.	WWII	U.S. bought 2,000 acres on south end for $11,000.
1901	Sold to Boquillas Land and Cattle Co. of Bakersfield, CA.		
1958	Kern County Land and Cattle Co. acquired Boquillas Land and Cattle Co. and the land grant.	1958	Kearn
1967	Kearn Co., consolidated with Tenneco, Inc.	1967	Tenneco
1971	Tenneco West, Inc.	1971	Tenneco West
1986	H.B. Bell Investments (AZ), Inc.	1986	H.B. Bell Investments (AZ), Inc.
1986	U.S. acquires land	1986	U.S. acquires land
1986-Present	Public land managed by Bureau of Land Management.	1986-Present	Public land managed by Bureau of Land Management.

Source: Early Arizona: Prehistory to Civil War, Jay J. Wagoner. 1975. University of Arizona Press, Tucson, AZ.

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APPENDIX 10

San Pedro Monitoring Plan
BUREAU OF LAND MANAGEMENT
Safford District, Arizona

Items Monitored	Monitoring Method	Monitoring Frequency	Changes Requiring Reevaluation
Vegetation			
Upland Vegetation	Permanent photo points	Yearly for 3 yrs., 5 yr. intervals.	Evaluate every 5 yrs.
Upland Vegetation	Pace frequence	5 yrs.	Evaluate every 5 yrs.
Riparian Vegetation	Permanent photo points	Yearly for 3 yrs., then 5 yr. intervals	Evaluate every 5 yrs. to determine needs.
Riparian Vegetation	Low level aerial photography	Yearly for 3 yrs., then 5 yr. intervals	Evaluate needs for Prescribed burns to maintain vegetation diversity.
Riparian Vegetation	Riparian Inventory	Every 5 yrs.	Evaluate need for riparian tree plantings, including management of areas.
Riparian Vegetation	Photo plot studies	Every 5 yrs.	Determine changes necessary in riparian management.
Wildlife			
Habitat Diversity	Acres per community type	Every 5 yrs.	25% from existing conditions.
Wildlife Species Diversity	Inventory	Annually	10% loss in existing numbers of species.
Riparian Habitat	Inventory	Every 5 yrs.	10% loss in acres/-structure.
Aquatic	Survey	Every 5 yrs.	10% change in water quality over a 3 yr. period.
			25% change in physical changes (changed stability, etc.).

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APPENDIX 11
BIOLOGICAL ASSESSMENT

INTRODUCTION

Under the requirements of Section 7 of the Endangered Species Act (ESA), as amended, BLM requested a list of Threatened and/or Endangered or proposed species from the U.S. Fish and Wildlife Service (FWS).

The FWS requested that BLM consider the peregrine falcon, aplomado falcon, and Mexican wolf. In addition, FWS recommended BLM consider Sanborn's long-nosed bat (Leptonycteris sanborni), a species proposed for listing. There were no Candidate species recommended by FWS.

PEREGRINE FALCON

Overview

The information on peregrine falcons came from the American Peregrine Falcon Recovery Plan (Rocky Mountain/Southwest population), dated December 14, 1984. The U.S. Fish and Wildlife Service prepared this plan in cooperation with American Peregrine Falcon Recovery Team.

Mearns collected a peregrine falcon (Falco peregrinus anatum) near Tucson in 1885. He speculated that it was nesting in the Santa Catalina Mountains at that time. The first reports of actual peregrine falcon nesting in Arizona was by Mearns in 1890 at Fort Verde. Later reports of peregrine nesting came from Brant who reported peregrine nesting in the Chiricahua Mountains during the summers of 1947 and 1948. Phillips et al, reported that peregrines nested throughout the state in 1964, but gave no locations.

In 1975, there were three pairs of peregrines nesting in Arizona. As of 1981, there were 54 known territories in Arizona.

Peregrine Falcon Recovery Plan

The overall emphasis of the Recovery Plan for the southwest populations of the peregrine falcon is "...monitoring and protection...".

The American Peregrine Falcon Recovery Plan (Rocky Mountain-Southwest Populations) emphasizes three major items in the protection and recovery of the peregrine falcon:

1. direct protection of the peregrines and their habitat,

2. action to increase natural productivity (restrict use of pesticides, etc.), and

3. a captive breeding and release program.

In addition, there are five major recovery actions to consider.

1. Identify and maintain existing and potential hunting and nesting habitat and evaluate previously unsurveyed habitats,

2. Monitor population trends, site occupancy and productivity of wild pairs,

3. Monitor pesticide contamination in breeding peregrines,

4. Continue management actions to maintain normally producing wild pairs and increase those wild populations with documented reproductive difficulties, and

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5. Continue release efforts to establish wild breeding pairs in Colorado, Idaho, Montana, Utah and Wyoming.

The Bureau has direct responsibilities in the three major protection and recovery items mentioned above. Additionally, the first recovery action pertains to BLM's responsibilities under Section 7 of the ESA.

Critical/Essential Habitats for the Peregrine Falcon

The Recovery Plan made no recommendations to the Secretary of the Interior regarding critical habitat. The San Pedro EIS area is not essential to the recovery of the peregrine falcon.

Peregrine Falcon Habitat

The San Pedro EIS area does not contain any suitable nesting sites (eyries) for the peregrine falcon. It may, however, be suitable hunting habitat. The most likely peregrine use of the EIS area would be as a migration corridor.

Potential nesting habitat probably exists outside the EIS area in the Huachuca Mountains to the west, the Mule Mountains to the east, or to the south in Mexico.

Peregrine Falcon Sightings

Bureau personnel have reported three sightings of peregrines within the San Pedro EIS area (one in 1987 and two in 1988). All of the sightings were thought to be of a migratory nature.

Determination of Effect

Proposed management activities will not have an effect on peregrine falcons or their habitat. The following factors were used to make this determination:

- The EIS area may be used as a foraging area by resident and non-resident peregrines. It is most likely, however, that peregrines use the area as a migration corridor. None of the proposed actions will significantly impact the use of this area as a migration corridor.

  None of the alternatives considered in detail will result in a significant change in the vegetation or animal communities. Thus, there will be no effect on the potential hunting use of the area by peregrines.

  As mentioned before, the San Pedro EIS area does not contain suitable nesting habitat for the peregrine falcon.

  These factors contribute to the accomplishment of major item number 1 and recovery action number 1.

  Major items 2 and 3 as well as recovery actions 2 through 5 are beyond the scope of this planning process.

- Federal law requires BLM to comply with Section 7 of the ESA. BLM will begin consultation with FWS in the event of any changes in peregrine activities or Bureau actions not included in the San Pedro Management Plan/EIS.

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APLOMADO FALCON

Overview

The northern aplomado falcon (Falco femoralis septentrionalis) was federally listed as an endangered species in 1986. This was the result of published evidence of population declines in eastern Mexico and the apparent extirpation of the falcon from the United States.

The description of the northern aplomado falcon is based on specimens collected by Bendire in 1892 (published in 1916 by Todd). Bendire collected specimens at Fort Huachuca, about 12 air miles from the San Pedro EIS area.

Only two authenticated reports of the falcon exist since 1910. The last known sighting was at St. David, AZ in 1940. St. David is near the northern boundary of the EIS area. According to personnel in the Arizona Game and Fish Department (AGFD), the aplomado falcon is extinct in Arizona and extirpated in the United States.

Aplomado Falcon Recovery Plan

The Bureau recently reviewed the Technical/Agency Review Draft Northern Aplomado Falcon Recovery Plan (Hector et al 1988). This document identified several areas in the Safford District for consideration as possible reintroduction sites for the falcon. The identified areas in southeastern Arizona are: Fort Huachuca Military Reservation, the Research Ranch (near Elgin, AZ), the San Simon Valley and the San Pedro EIS area.

Three major problems are thought to influence the aplomado falcon population:

- o habitat loss,
- o pesticide contamination, and
- o human disturbance.

The Bureau's responsibilities include activities that influence all three of these problems.

Critical/Essential Habitat for the Aplomado Falcon

The Draft Recovery Plan did not make any recommendations regarding critical/essential habitat. The Draft Recovery Plan, however, did recommend consideration of the EIS area as a potential reintroduction site.

Aplomado Falcon Habitat

The Draft Recovery Plan identified the EIS area as habitat suitable for a reintroduction site. The Draft also states:

> "Northern portions of this refuge are bound by creosote flats and mesquite encroached floodplains. Some potential release sites, however, might be located to the south, near the Mexican border. Much of this land is publicly owned and would be available for release activities. In addition, continued acquisition of grassland to the north should steadily improve the quality of this site. Although aplomado falcons apparently did nest along gallery woodlands (Grayson in Lawrence 1874, and Henshaw 1875), initial releases should be accomplished in grassland sites."

The San Pedro EIS area does contain desert grasslands that may be suitable hunting habitat for the aplomado falcon. Nesting habitat, requiring nests constructed in trees or shrubs by other species of birds, may be lacking. The riparian areas along the San Pedro River may, however, provide some nesting habitat.

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Aplomado Falcon Sightings

Avian inventories, ongoing since 1986, have not reported any sightings in the EIS area. In addition, local birdwatchers and the Huachuca Audubon Society have not made any sightings.

Determination of Effect

Proposed management activities will not have an effect on aplomado falcons or their habitat. The following factors were used to make this determination:

- Management actions will not significantly change the amount, condition, or quality of the existing vegetation communities. Therefore, habitat losses to the aplomado falcon will be minimal.
- Pesticide use on the public lands in the San Pedro EIS area is prohibited. Therefore, pesticide use in the area will not be a factor where BLM has jurisdiction.
- Policies from the planning process, legal mandates and BLM policies can control human disturbance. The following objectives and planned actions (by EIS alternative) relate these controls.

Management Practices Common to All Alternatives

Establish mitigation procedures to reduce impacts to wildlife and wildlife habitat.

No Action Alternative

Close the EIS area to all public use, including birdwatching and hunting, and limit administrative uses.

Preservation Alternative

Close all roads to public use but allow continued BLM administrative use of roads. The ORV designation is "closed".

Close the EIS area to the discharge of firearms.

Utilization Alternative

Protection of the wildlife resources, cultural and paleontological resources, vegetation and water quality/quantity is a major component of this alternative.

Allow public vehicular use on designated roads only. The ORV designation is "Limited to Designated Roads".

Close the EIS area to the discharge of firearms except those associated with regulated hunting.

Allow hunting but limit the season to the period of September 1 through March 31.

Preferred Alternative

Allow public vehicular use on designated roads only. The ORV designation is "Limited to Designated Roads".

Allow hunting but limit the season to the period of September 1 through March 31.

Close the EIS area to the discharge of firearms except those associated with regulated hunting.

Allow overnight use by permit only.

Protect important raptor areas and heron rookeries identified through the planning

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process. Identify special management in the Habitat Management Plan.

Minimize public and administrative activities around important wildlife areas, such as active nest sites, during the breeding/fledging season.

MEXICAN WOLF

Overview

The information on the Mexican Wolf came from the Mexican Wolf Recovery Plan, U.S. Fish and Wildlife Service (1982).

One subspecies of the gray wolf, Canis lupus baileyi, occupied most of the extreme southeast corner of Arizona and extreme southwestern New Mexico. Another subspecies (C. l. mogollonensis) occupied the areas of the White and San Francisco Mountains in Arizona and was found in west central New Mexico. A third subspecies, C. l. monstrabilis occupied southeastern New Mexico and most of western Texas. Recent studies on the gray wolf in the southwestern United States and northern Mexico, have recommended reclassifying all three southwestern subspecies of the gray wolf as one subspecies, C. l. baileyi.

Brown (1983) believed the wolf to be extirpated from the southwestern United States and Mexico by 1970 and 1982 respectively. The Mexican Wolf Recovery Plan (1982), however, lists at least three different reports of wolves in Arizona in the early 1970's through 1973, (even later reports are on record for New Mexico).

Mexican Wolf Recovery Plan

The prime objective for the Mexican Wolf Recovery Plan is:

> "To conserve and ensure the survival of Canis lupus baileyi by maintaining a captive breeding program and re-establishing a viable self-sustaining population of at least 100 Mexican wolves in the middle to high elevations of a 5,000 square mile area within the Mexican wolf's historic range."

The Recovery Team developed a "step-down plan" in order to attain the prime objective of the Mexican Wolf Recovery Plan. Portions of this step-down plan apply to federal agencies and their responsibilities under Section 7 of the Endangered Species Act of 1973, as amended.

Most of the items listed in the step-down plan apply to state, regional or national efforts. These steps will be addressed at higher levels of management by the various agencies. Several items may be addressed at local levels, as follows:

- Ensure legal protection of wild wolves in Mexico, Arizona, New Mexico and Texas.

  Seek vigorous enforcement of laws protecting Mexican wolves and imposition of maximum legal penalties for intentional violations of these laws.

- Increase population of wild prey species important to wolves.

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Continue to improve and protect habitat and its associated prey base.

Attempt to foster favorable attitudes toward wolves among the public.

Critical/Essential Habitats for the Mexican Wolf

The Mexican Wolf Recovery Plan did not specifically identify an area to establish as Critical Habitat. The Plan stated areas in Mexico would be first priority. The San Pedro EIS area has not been identified as essential habitat

Mexican Wolf Habitat

Habitats the Mexican wolf prefers are pine-clad mountains, oak woodlands, pinyon-juniper forests and grasslands above 4,500 feet in elevation. Wolves are reportedly absent from the desert scrub and semi-desert grasslands of the Chihuahuan and Sonoran deserts.

Habitat in the San Pedro EIS area is, at best, marginal for the wolf. The only preferred wolf habitat that may be in the area are the high elevation grasslands.

Wolves used mountain ranges to travel from Mexico to the southwestern United States. These travel routes are referred to as runways. One major runway occurs to the east of the San Pedro EIS area. It includes the Mule Mountains, Dragoon Mountains, the east side of the Winchester and Galiuro Mountains, and then north into Aravaipa Canyon (Brown 1983). The Huachuca Mountains to the west may also have good potential as a wolf runway.

Mexican Wolf Sightings/Reports

Historically, there have been many wolf reports in the Chiricahua, Mule, and Dragoon Mountains to the east, the Winchester and Galiuro Mountains to the north, and the Pinaleno (Graham) Mountains to the northeast of the San Pedro EIS area.

Wolf Reports

1898 east slope of Galiuro Mountains, specimen collected

1917 Ft. Huachuca, specimen collected

1924 Parker Canyon, specimen collected

1937 Chiricahua Mountains, two wolves trapped

1937 Peloncillo Mountains in Cochise county, wolf trapped

1940-1950's Huachuca Mountains

1947 Graham (Pinaleno) Mountains, two wolves trapped

1951,1953 Graham (Pinaleno) Mountains, wolf sightings

1961 Red Rock Canyon (Santa Cruz County), specimen killed & collected

1970 Aravaipa Canyon, specimen killed and collected

1972 Galiuro Mountains (Pinal-Graham county line), depredation report

1973 Elgin, AZ, sighting report

1973 Santa Rita Experimental Range (Pima County), wolf sighting

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? east of Douglas, AZ, sighting

? Ft. Huachuca, AZ, one male wolf and pups killed, female escaped (may be the same report as the 1940-1950's report for the Huachuca Mtns.)

This list is not complete but is shows the habitats and range of wolf reports since the late 19th century and through the present.

Determination of Effect

Proposed management activities will not have an effect on the Mexican Wolf or its habitat. The following factors were used to make this determination:

- o There are no known wolf reports from the San Pedro EIS area, indicating a lack of preferred habitat. Although much of the EIS area is above 4,500 feet in elevation, very little is in the preferred wolf habitat of grasslands. Most of the EIS area is Chihuahuan Desert scrub.
- o The area has no suitable topography for use as a wolf runway.
- o Federal law requires BLM to conserve federally listed Threatened and Endangered species. Future wolf sightings in the EIS area will cause BLM to comply with and vigorously enforce the Endangered Species Act. This will fulfill part of the Mexican Wolf Recovery Plan.
- o Management actions identified in the San Pedro Management Plan/EIS will result in more favorable habitat available for the wolf. The recent removal of livestock from the EIS area will improve habitat for the wolf's prey (javelina, mule deer and whitetail deer). This will help meet part of the Recovery Plan.

SANBORN'S LONG-NOSED BAT

Overview

Not much was known about the Sanborn's long-nosed bat (Leptonycteris sanborni) until recently. A literature search of Hall and Kelson (1959) and Burt and Grossenheider (1964) revealed no listing for the species in these publications. Further investigation revealed the species has also been called Leptonycteris yerbabuenae. Barbour and Davis identified the "little long-tongued bat" as Leptonycteris sanborni (Bats of America, 1969).

Apparently, Sanborn's long-nosed bat is confused with its very close relative, the Mexican long-nosed bat (Leptonycteris nivalis). The Fish and Wildlife Service proposed to list both species on July 6, 1987.

Sanborn's long-nosed bat is one of the nectar feeding bats.

Sanborn's Long-nosed Bat Recovery Plan

There has not been a recovery plan prepared for this bat.

Critical/Essential Habitats for the Long-nosed Bat

None identified

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Long-nosed Bat Habitat

The long-nosed bat feeds in the desert scrub communities that have a preponderance of agave's, organ-pipe cactus, yuccas or sahuaro cactus. The bats roost and raise their young in caves or abandoned mine tunnels. They are most likely found at the base of mountains near these plants.

Sanborn's long-nosed bat does not hibernate. Apparently the bat migrates into Mexico in late September and returns in mid-May.

Yellow-stained fecal material on the floors of caves, and tunnels identifies nectar feeding bat roosting/maternity sites.

The San Pedro EIS area does not have the necessary caves or mining tunnels necessary for roosting/-maternity sites. In addition, the area does not provide much, if any, feeding habitat due to the low density of yuccas and agaves (There are no sahuaro or organ-pipe cactus in the area). The area may function as a migration corridor during the spring and fall migrations.

Long-nosed Bat Sightings

Recently, most of the reports in southeastern Arizona have been from the Huachuca, Chiricahua, Pinaleno and Galiuro Mountains. The Huachuca Mountains are closest, just west of the San Pedro EIS area. The Chiricahua Mountains are about 50 miles east, Galiuro Mountains about 50 miles north, and the Pinaleno Mountains about 70 miles to the northeast. There have been no reports or sightings of the bat within the EIS area.

Determination of Effect

Proposed management activities will not have an effect on Sanborn's long-nosed bats or their habitat. The following factors were used to make the determination:

- Use of the EIS area for foraging by resident and nonresident bats may occur. This use is minimal due to the absence of good forage species density.
- Bats may use the EIS area as a migration corridor between Mexico and roosting/maternity sites in Arizona. The EIS area does not contain caves and/or tunnels suitable for the long-nosed bat. Nothing proposed in the Plan will effect the use or adequacy of the area as a migration corridor.
- Long-nosed bat habitat is limited in the EIS area and there are no verified sightings.

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GLOSSARY

The following abbreviations are used in this document.

ACEC	Area of Critical Environmental Concern
AD	Years after Christ
AGFD	Arizona Game and Fish Department
AIRFA	American Indian Religious Freedom Act of 1978
ARPA	Archaeological Resources Protection Act
BC	Years before Christ
BLM	Bureau of Land Management
BP	Years before the present
CFS	Cubic feet per second
CRM	Cultural resource management
CRMP	Cultural Resource Management Plan
EIS	Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
HMP	Habitat Management Plan
LAC	Limits of Acceptable Change
NHPA	National Historic Preservation Act
ORV	Off-road vehicle
RNA	Research Natural Area
ROW	Right-of-way
VRM	Visual resource management
MY	Million years ago

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ACTIVE MANAGEMENT AREA. A watershed or segment of watershed designated as a special management area to provide protection for the ground and surface water resources. The 1980 Groundwater Management Act specifies that the Director of the Arizona Department of Water Resources may create a new Active Management Area if it is determined that any of the following conditions exist: (1) active management practices are necessary to preserve the supply of groundwater for future needs, (2) land subsidence or fissuring is endangering property or potential groundwater storage capacity, or (3) use of groundwater is resulting in actual or threatened water quality degradation.

ACTIVITY PLAN. A more detailed and specific plan or program of actions to implement planning decisions over some specified time period. Examples include allotment management plans, recreation area management plans, habitat management plans, and cultural resource management plans.

ADVERSE EFFECT. Alteration of the characteristics that contribute to the use(s) determined appropriate for a cultural resource or that qualify a cultural property for the National Register to such a degree that the appropriate use(s) are diminished or precluded or the cultural property is disqualified from National Register eligibility. Criteria in the regulations of the Advisory Council guide the determination of adverse effect.

ALLOCATION. The division of limited resource capabilities or supplies among the competitors for use.

ALLUVIAL. Soil or earth material which has been deposited by running water.

ALLUVIAL FAN. The alluvial deposit of a stream where it issues from a gorge upon a plain or of a tributary stream at its junction with the main river.

AMERICAN INDIAN RELIGIOUS FREEDOM ACT OF 1978. Among its provisions, the Act provides for American Indian access to religious sites and the use and possession of sacred objects. The Act requires that (1) the views of Indian leaders be obtained and considered when a proposed land use might conflict with traditional Indian religious beliefs or practices, and that (2) unnecessary interference with Indian religious practices be avoided during project implementation, but specifying that (3) conflict need not necessarily bar federal agencies from adopting proposed land uses that are in the public interest.

AQUATIC. Of or pertaining to water. Living or growing in water.

ARCHAEOLOGICAL RESOURCES PROTECTION ACT OF 1979. The Act provides felony level penalties for the unauthorized excavation, removal, damage, alteration, defacement, sale, purchase, exchange, transportation, receipt, or offering of archaeological resources found on public land or Indian land. Definitions, permit requirements, and criminal and civil penalties are established. The Act overlaps with and partially supercedes the Antiquities Act. It is implemented by uniform regulations at 43 CFR Part 7.

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ARCHAIC TRADITION. A pattern of life generally associated with a pre-ceramic, pre-agricultural stage of prehistory. The Cochise Culture of southeast Arizona followed this tradition. The Archaic Tradition dates from about 8000 B.P. to about A.D. 1.

AREA OF CRITICAL ENVIRONMENTAL CONCERN. An area of public land that requires special management attention in order to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

ARTESIAN FLOW. Groundwater that is confined under pressure beneath impervious earthen material until penetration of the impervious material with a well hole that allows the groundwater to rise to the surface and flow continuously.

AVIAN. Of or pertaining to birds.

AVOIDANCE. A potential adverse effect is prevented from occurring by the partial or complete redesign or relocation of a proposed land use.

BASE FLOW. That portion of streamflow that is sustained from groundwater flowinto the river channel.

CANDIDATE SPECIES. Species not protected under the Endangered Species Act but under consideration by the Fish and Wildlife Service for inclusion on the list of federally threatened or endangered species.

CATCHMENT. A structure built to collect and retain rainwater from an upstream drainage area. It typically consists of a gently sloping impervious surface (apron) onto which rainwater collects before flowing into a storage tank. A slickrock catchment uses a natural slickrock surface as an apron.

CHANNEL STABILITY. A relative term describing erosion or movement of the channel walls or bottom due to overflow.

CLIMAX COMMUNITY. Highest ecological development of a community on a given site determined primarily by climate but also influenced by soil, topographic, vegetative, fire and animal factors.

COCHISE CULTURE. Prehistoric culture of southeast Arizona and southwest New Mexico believed to have begun over 8,000 years ago and to have lasted until 500 B.C. or later. The Cochise culture's economy was based on gathering wild plant foods and hunting small game. Settlements were temporary.

COMMUNITY. A group of plants and animals living together in a common area and having close interactions.

CONSERVATION FOR FUTURE USE. A cultural resource will be separated and protected from noncompatible land uses and preserved in place because (1) that particular site type is scarce or unique, (2) its information potential cannot be realized through available archaeological methods, or (3) it represents an outstanding example of a particular site type.

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CRITICAL WILDLIFE HABITAT. The area of land, water and airspace required for the normal needs and survival of an endangered species. Critical wildlife habitat is designated by the Secretary of the Interior.

CRUCIAL HABITAT. Crucial habitat includes portions of the habitats of officially designated BLM sensitive species or special status species that, if destroyed or adversely modified, could result in their being listed as threatened or endangered pursuant to the Endangered Species Act, or in some category implying endangerment by a state agency or legislature.

CUBIC FOOT PER SECOND. The expression for one cubic foot of water passing a given point in one second. One CFS equals 7.48 gallons per second.

CULTURAL PROPERTY. Any definite location of past human activity, habitation or use identified through a field inventory, historical documentation or oral evidence. This term may include (1) archaeological or historic sites, structures and places and (2) sites or places of traditional cultural or religious importance to a specific group, whether or not represented by physical remains. Cultural properties are managed by the system of inventory, evaluation, protection and use.

CULTURAL RESOURCE. The fragile and nonrenewable remains of human activity, occupation or use, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture and natural features that were of importance in past human events. These resources consist of: (1) physical remains, (2) areas where significant human events occurred, even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

CULTURAL RESOURCE INVENTORY. A descriptive listing and documentation of cultural resources, including photographs and maps; the processes of locating, identifying, and recording sites, structures, buildings, objects and districts through library and archival research; information from persons knowledgeable about cultural resources; and on-the-ground field surveys of varying levels of intensity. (See Cultural Resource Inventory Classes.)

CULTURAL RESOURCE INVENTORY CLASSES. Class I - library, archival, and literature research with consultation to identify known cultural resources. Class II - a sampling field inventory of an area, systematically designed to provide a predictive model of the nature and distribution of the cultural resources in an area. Class III - an intensive field search of all surface-evident cultural resources in an entire area.

CULTURAL RESOURCE MANAGEMENT PLAN. A relatively brief activity plan in whichdeterminations (management objectives) made in resource management plans are more fully developed. Use allocations and related protection priorities are established in the CRMP and scientific research objectives are identified by historic context. These plans may be prepared for individual sites, for a group of sites, for each historic context, or for a geographic area.

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CULTURAL RESOURCE SITE. A physical location of past human activities or events. Sites vary in size, ranging from the location of a single cultural resource object to a cluster of cultural resource structures with associated objects and features.

DEGRADATION. The removal of channel bed materials during floods through downcutting of the natural stream channels.

DISCHARGE. The quantity of streamflow, usually stated in cubic feet per second as a unit of measurement.

DIVERSITY. A measure of the number of different terrestrial or aquatic communities, vegetational structures and physical parameters within these communities that lead to many different wildlife habitats.

ECOLOGICAL SUCCESSION. See Succession, Plant.

ECOSYSTEM. A complex self-sustaining natural system which includes living and nonliving components of the environment and the interactions that bind them together. Its functioning involves the circulation of matter and energy between organisms and their environment.

EFFECT. Any change in the characteristics that contribute to the use(s) determined appropriate for a cultural resource or to the qualities that qualify a cultural property for the National Register. Determination of effect is guided by criteria in the regulations of the Advisory Council.

ENDANGERED SPECIES. An animal or plant whose prospects of survival and reproduction are in immediate danger of extinction throughout all or part of its range. Defined by the Endangered Species Act, as amended. Endangered species are designated by the Secretary of the Interior.

ENTRENCHMENT. Downcutting of a stream channel during flooding.

ENVIRONMENT. The surrounding conditions, influences or forces that affect or modify an organism or an ecological community and ultimately determine its forms and survival.

ENVIRONMENTAL IMPACT STATEMENT. An analytical document developed for use by decisionmakers to weigh the environmental consequences of a potential decision. An EIS should accurately portray potential impacts on the human environment of a particular course of action and its possible alternatives.

EPHEMERAL FLOW. Flow occurring in a channel in response to an intense or long duration storm, usually ceasing one to two days after the end of the storm.

EROSION. The wearing away of the soil and surface by running water, wind, ice or other geological agents.

EVALUATION. The analysis of cultural resource inventory records, the application of professional judgement to identify characteristics that contribute to possible uses for recorded cultural resources, and the recommendation of appropriate use(s) for each resource or group of resources. National

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Register eligibility criteria are interpreted through or with reference to Bureau evaluation criteria.

EXCHANGE. Acquisition and disposal of lands and interests therein for the benefit of the public through land exchange with the state or private sector.

EXOTIC. Not native to the place where found; pertains to plants and animals.

EXTIRPATED. Refers to species that once occupied an area but have since been eliminated from that portion of their range.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976. The Act gives BLM the legal authority to establish public land policy; to establish guidelines for administering such policy; and to provide for the management, protection, inventory, development and enhancement of the public lands.

FIREARMS. A gun or rifle, etc., from which a projectile is fired.

FLOODPLAIN. The nearly level lowland (alluvial plain) that borders a stream or river and is subject to inundation during high water periods; the relatively flat area or lowlands adjoining a body of standing or flowing water which has been or might be covered by floodwaters.

FLOODPLAIN AQUIFER. A body of groundwater existing within the floodplain area. The quantity of water in storage is influenced by the fluctuation of surface flow.

FOSSIL. Any remains, trace or imprint of an ancient plant or animal that has been preserved by natural processes.

GRABEN. A depressed segment of the earth's crust bounded on at least two sidesby faults.

GRADED ROAD. A regularly maintained (bladed) dirt road with drainages and generally available to passenger vehicles.

GRAVELED ROAD. A regularly maintained (bladed) road with a gravel surface and drainages, available for use by passenger vehicles.

HABITAT. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover and living space.

HABITAT MANAGEMENT PLAN. A written and officially approved plan for a specific geographic area that identifies wildlife habitat and related objectives, establishes the sequence of actions for achieving objectives and outlines procedures for evaluating accomplishments.

HERON ROOKERY. A breeding and/or nesting area for a colony of herons.

HERPETILE. An amphibian or reptile.

HISTORIC RESOURCES. Cultural resources that date after the arrival of Europeans in the Southwest (about A.D. 1700 to the present).

HOHOKAM CULTURE. A prehistoric culture in southern Arizona dating from about 300 B.C. to about A.D. 1450. It is not known whether they were indigenous to the area or originated in Mexico. They are known for their extensive irrigation farming.

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INDIGENOUS. Being native to an area.

INTERMITTENT FLOW. Flow that occurs for longer than several weeks after a major storm but ceases flowing during an extended dry season. Any flow lasting less than 11 months in any year.

LAND GRANT. Parcels of land granted by the Spanish and Mexican governments to individuals.

LIMITS OF ACCEPTABLE CHANGE. A process for establishing acceptable and appropriate changes in recreation settings.

MAMMAL. A class of vertebrates that possess fur (hair) and suckle young on their mothers milk.

MITIGATION. The lessening of a potential adverse effect by applying appropriate protection measures, the recovery of data or other measures.

MITIGATION MEASURES. Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

MOGOLLON CULTURE. A prehistoric culture in west-central and southwest New Mexico and east-central and southeast Arizona that was largely contemporaneous with the Anasazi and Hohokam (300 B.C. - A.D. 1200) and shared some traits with both cultures, particularly the Anasazi. The Mogollon economy was to a great extent based on agriculture and the gathering of wild plant foods.

NATIONAL HISTORIC PRESERVATION ACT. The Act expands the National Register of Historic Places, and establishes the Advisory Council on Historic Preservation, State Historic Preservation Officers, and a preservation grants-in-aid program. Section 106 directs all federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for the National Register of Historic Places. Section 110 sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties. Section 106 of the Act is implemented by regulations of the Advisory Council on Historic Preservation.

NATIONAL REGISTER OF HISTORIC PLACES. The Register is authorized by the Historic Sites Act and the National Historic Preservation Act and is expanded and maintained by the Secretary of the Interior. The Register lists cultural properties found to qualify for inclusion because of their local, state or national significance. Eligibility criteria and nomination procedures are in 36 CFR Part 60. Administrative responsibility for the Register is delegated to the National Park Service.

NATIONAL REGISTER QUALITY SITE. A cultural resource site determined to be eligible for nomination to the National Register of Historic Places by virtue of its local, state or national significance.

NATIVE AMERICAN VALUES. Native Americans hold specific and traditional values for sites or areas that may not contain cultural artifact or feature remains. Such sites or areas include but are not limited to places where hunting or gathering has occurred, or special

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areas considered sacred in their religious beliefs.

NATURALNESS. Quality of generally appearing to have been affected primarily by the forces of nature, with human influence largely unnoticeable.

NONGAME. Wildlife and fish species that are not hunted, fished or utilized for human consumption.

OFF-ROAD VEHICLE. Any motorized, tracked or wheeled vehicle designed for cross-country travel over any type of natural terrain.

OFF-ROAD VEHICLE DESIGNATIONS: The land use planning process identifies thefollowing categories:

Open - Designated areas and trails where ORVs may be operated (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343).

Limited - Designated areas and trails where the use of ORVs is subject to restrictions, such as limiting the number or types of vehicles allowed, dates and times of use (seasonal restrictions); limiting use to existing roads and trails or limiting use to designated roads and trails. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year.

Closed - Designated areas and trails where the use of ORVs is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

PALEO INDIAN. The term applied to the first people who occupied the Americas. Present evidence shows they entered North America from the north at least 11,000 years ago. They hunted large mammals that are now extinct, such as mammoth, mastodon, and bison. The earliest known Paleo Indians were the Clovis people.

PALEONTOLOGY. The science that deals with the life of past geologic ages. It is based on the study of the fossil remains of organisms and in a restricted sense is the study of fossils.

PALEONTOLOGICAL RESOURCES. Fossils; the remains of animals and plants that provide information about life in past geologic ages.

PERENNIAL STREAM. A stream that flows throughout the year.

PHREATOPHYTE. A deep-rooted plant obtaining water from an aquifer (water table).

PLANNING UNIT. A geographical subdivision of a resource area.

PLIOCENE. The geologic epoch at the end of the Tertiary period, which lasted from 12 million to one million years ago.

PREHISTORIC RESOURCES. Cultural resources that predate the arrival of Europeans in the Southwest (about A.D. 1700).

PRIMITIVE AND UNCONFINED RECREATION. Nonmotorized, nondeveloped types of outdoor recreation, that can be dispersed and do not require facilities. Some examples are hiking, backpacking, fishing, hunting, spelunking, horseback riding, rock climbing, river running, cross-country skiing, snowshoeing, canoeing, photography and nature study.

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PRIORITY USE AREA. An area where a particular resource, such as wildlife habitat, would receive management emphasis or priority. The areas are either unique, significant or best suited for the development, management, use or protection of a resource. The principles of multiple use and sustained yield would be maintained in each priority use area. Many different uses would be allowed in these areas but the priority use would have the most emphasis. Other land uses would have limits placed on them to prevent conflicts with the priority resource. In some instances, a use totally incompatible with the priority resource would be excluded.

PROPOSED LAND USE. Any use of lands or resources that requires an authorized officer's formal approval, whether proposed by the Bureau or by an outside applicant.

PUBLIC LAND. Federal lands administered by the Bureau of Land Management.

RANGE CONDITION. The present state of vegetation of a range site in relation to the climax plant community (natural potential) of that site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community.

RANGE CONDITION TREND. Direction of change, whether stable, toward (upward), or away (downward) from the site's potential.

RAPTOR. A bird of prey with sharp talons and strongly curved beaks, e.g., hawks, owls, vultures, eagles.

RECREATION AND PUBLIC PURPOSES ACT. An act authorizing the Secretary of the Interior to lease or convey public lands for recreational and public purposes under specified conditions to states or their political subdivisions and to non-profit corporations and associations.

REGIONAL AQUIFER. A body of groundwater underlying an entire watershed, excluding the floodplain aquifer. The regional aquifer is usually recharged along the base of mountains, with the excess groundwater in storage discharged into a natural stream channel.

RESEARCH NATURAL AREA. A natural area established and maintained for research and education, that may include: (1) typical or unusual plant or animal types, or associations or other biotic phenomena or (2) characteristic or outstanding geologic, soil, or aquatic features or processes. The public may be excluded or restricted from such areas to protect studies.

RESOURCE AREA. The smallest administrative subdivision of a BLM district.

RIGHT-OF-WAY CORRIDOR. A parcel of land either linear or areal in character that has been identified by law or Secretarial Order, through the land use planning process or by other management decision, as being a preferred location for existing and future right-of-way grants and suitable to accommodate more

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than one type of right-of-way or one or more rights-of-way which are similar, identical or compatible.

RIPARIAN AREA. An area where the vegetation shows the effects of open water or water very close to the surface of the ground. This includes the shores of lakes and reservoirs, intermittent or perennial streams, desert washes, springs, and rivers.

ROADLESS. The absence of roads that have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road.

RUNOFF. The water that flows on the land surface from an area in response to rainfall or snowmelt. As used here, runoff from an area becomes streamflow when it reaches a channel.

SALADO CULTURE. A prehistoric culture that probably originated in the Tonto Basin of Arizona and spread throughout southeast Arizona from about 1200 to 1450 A.D. The Salado economy was based on agriculture.

SCOPING. An early and open process for determining the scope of issues to be addressed in an EIS and for identifying the significant issues related to a proposed action. Scoping may involve public meetings, field interviews with representatives of agencies and interest groups, discussions with resource specialists and managers, and written comments in response to news releases, direct mailings and articles about the proposed action and scoping meetings.

SECTION. A 1-square mile area forming one of the 36 subdivisions of a township.

SECTION 106. Section 106 of the National Historic Preservation Act of 1966, as amended.

SENSITIVE SPECIES. A designation that is (1) applied to species not yet officially listed but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior or the Secretary of Commerce or in accordance with comparable state documents published by state officials; (2) applied to species whose populations are consistently small and widely dispersed or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat availability, or habitat condition might lead toward extinction; or (3) applied to species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure.

SHERD. A fragment of a pottery vessel.

SKEWED. A curve is skewed when populations do not follow a normal "Bell Curve" distribution but have a preponderance of measurements on one side of the mean as compared to the other.

SOBAIPURI CULTURE. A protohistoric culture living in the San Pedro Valley from about A.D. 1450 to about 1770. They spoke a Piman language, subsisted primarily on farming, and were eventually forced out of the valley by the Apache.

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SOCIO-CULTURAL VALUE. The importance attributed to an object (including flora and fauna), structure, place, living thing, lifestyle, or belief by a group based on the group's perception of the object's role in maintaining their heritage or their existence as a group. Usually expressed in qualitative rather than quantitative terms.

SOIL HORIZON. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

SOLITUDE. The state of being alone or remote from habitations; isolation.

SPECIAL RECREATION MANAGEMENT AREA. An area requiring explicit recreation management to achieve the Bureau's recreation objectives and to provide specific recreation opportunities. Special recreation management areas are identified in management plans, which also define the management objectives for the area. BLM's recreation investments are concentrated in these areas.

SPECIAL STATUS SPECIES. Animals that are not federally listed but are on state lists as needing protection.

SPECIES COMPOSITION. Proportions of various plant species in relation to the total on a given area; may be expressed in percentages based on weight, crown cover or basal intercept.

STABILIZATION. Protective techniques applied to historic structures and ruins to maintain their existing condition and prevent further deterioration, for example, capping adobe brick walls with adobe mortar.

STATE HISTORIC PRESERVATION OFFICER. The official who is appointed by the Governor to be responsible for administering the State Historic Preservation Program pursuant to the National Historic Preservation Act.

SUCCESSION, PLANT. The process of one plant community being replaced by another until a climax community is reached.

THREATENED SPECIES. Any plant or animal species likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range. Defined by the Endangered Species Act, as amended. Threatened species are designated by the Secretary of the Interior.

TOPOGRAPHY. The exact physical features and configuration of a place or region; the detailed and accurate description of the landforms of a place or region.

UNAUTHORIZED USE. Intentional or unintentional use of public lands without proper authority.

UPLAND HABITAT. Plant communities not usually associated with riparian or floodplain habitats. Found in higher elevations.

VEGETATION TYPE. A plant community with distinguishable characteristics described by the dominant vegetation present.

VEHICLE WAY. A vehicle route established and maintained solely by the passage of motor vehicles.

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VISUAL RESOURCES. The visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features).

VISUAL RESOURCE MANAGEMENT. The planning, designating and implementing of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT CLASSES. Classification containing specific objectives for maintaining or enhancing visual resources, including the kinds of structures and modifications acceptable to meet established visual goals.

Class I areas (preservation) provide for natural ecological changes only. This class includes wilderness areas, some natural areas, some wild and scenic rivers and other similar sites where landscape modification activities should be restricted.

Class II (retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color or texture) caused by management activity should not be evident in the characteristic landscape.

Class III (partial retention of the landscape character) includes areas where changes in the basic elements (form, line, color or texture) caused by management activity may be evident in the characteristic landscape. The changes, however, should remain subordinate to the visual strength of the existing character.

Class IV (modification of the landscape character) includes areas where changes may subordinate the original composition and character; they should, however, reflect what could be a natural occurrence within the characteristic landscape.

WATER QUALITY. The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

WATERSHED. The region draining into a river, river system, or body of water.

WILDERNESS. An area formally designated by Congress as a part of the National Wilderness Preservation System.

WILDERNESS CHARACTERISTICS. Identified by Congress in Section 2(c) of the Wilderness Act of 1964, "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation;

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(3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

WILDLIFE. Animals living in the wild that have not been domesticated by man.

WILDLIFE WATERS. Artificial sources of water for wildlife, including a variety of projects such as catchments, masonry dams with storage tanks and drinkers and spring developments. Water for wildlife may even be piped off existing livestock storage tanks.

WITHDRAWAL. An action that restricts the use of public land and segregates the lands from the operation of all or some of the public land or mineral laws.

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II

99TH CONGRESS
2D SESSION

S. 2442

To establish the San Pedro Riparian National Conservation Area in Cochise County, Arizona, in order to assure the protection of the riparian, wildlife, archaeological, paleontological, scientific, cultural, educational, and recreational resources of the conservation area, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MAY 13 (legislative day, MAY 12), 1986

Mr. DECONCINI (for himself and Mr. GOLDWATER) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To establish the San Pedro Riparian National Conservation Area in Cochise County, Arizona, in order to assure the protection of the riparian, wildlife, archaeological, paleontological, scientific, cultural, educational, and recreational resources of the conservation area, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. ESTABLISHMENT OF CONSERVATION AREA.

(a) ESTABLISHMENT.—(1) There is hereby established the San Pedro Riparian National Conservation Area (in this Act referred to as the "conservation area").

(2) The conservation area shall—

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(A) consist of Federal lands acquired by exchange or purchase; and

(B) be managed by the Secretary of the Interior, acting through the Bureau of Land Management, (in this Act referred to as the "Secretary") in accordance with the provisions of this Act.

(3) The conservation area shall not cover more than 60,000 acres.

(b) BOUNDARIES.—Lands to be included in the conservation area are generally depicted on a map entitled "Boundary Map, San Pedro Riparian National Conservation Area", and 51 Fed. Reg. 8715, which together with a legal description, ref. A21410, shall be on file and available for public inspection in the offices of the Secretary of the Interior, Washington, D.C., and in appropriate State and local offices of the Bureau of Land Management in the State of Arizona. The Secretary shall finalize the boundaries of the conservation area no later than 5 years after the date of enactment of this Act.

SEC. 2. MANAGEMENT OF CONSERVATION AREA.

(a) MANAGEMENT.—The Secretary shall manage the conservation area—

(1) in accordance with the provisions of this Act, and where not inconsistent with the provisions of this Act, the principles of the Federal Land Policy and

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Management Act of 1976 (43 U.S.C., 1701 et. seq.); and

(2) in a manner that conserves, protects, and enhances the riparian, wildlife, archaeological, paleontological, scientific, cultural, educational, and recreation resources of the conservation area.

(b) OTHER USES.—The Secretary may allow uses other than those specified in subsection (a) if he can show that such uses will have no significant adverse effects on the primary purposes for which the conservation area is established.

(c) NO DISPOSITION OF LANDS WITHIN CONSERVATION AREA.—Notwithstanding any other provision of law, lands within the conservation area shall not be available for disposition, except through exchange to improve boundaries.

SEC. 3. MANAGEMENT PLAN.

(a) DEVELOPMENT OF PLAN.—No later than two years after the date of enactment of this Act, the Secretary shall develop a plan for the comprehensive and long-term management, development, and protection of the conservation area. The plan shall be developed with full opportunity for public participation and comment, and shall contain provisions designed to assure protection of the riparian, wildlife, archaeological, paleontological, scientific, cultural, and recreation resources and values of the conservation area.

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(b) USE OF CONSERVATION AREA.—The plan developed pursuant to subsection (a) shall generally provide for visitor use of the conservation area. Notwithstanding the preceding sentence, the Secretary may limit visitor use, close portions of the conservation area to public use, or allow use of the conservation area by permit only (to be issued by him with appropriate conditions) in order to insure protection of the conservation area's resources and values as provided in this Act.

(c) RESEARCH IN CONSERVATION AREA.—In order to assist in the development of appropriate management strategies for the conservation area, the Secretary may authorize research on matters including the environmental, biological, hydrological, and cultural resources in the conservation area.

(d) PRIVATE MANAGEMENT.—The Secretary may enter into cooperative agreements with appropriate State and local agencies or private organizations for the management of any portion of the conservation area in accordance with land use plans for the conservation area developed pursuant to the provisions of this Act.

SEC. 4. MULTIPLE USE ADVISORY COUNCIL.

The Secretary of the Interior shall establish a Multiple Use Advisory Council which shall advise and recommend to the Secretary appropriate management practices to implement the provisions of the land use plan and the purposes of

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this Act. The members of the council shall be appointed by the Secretary and shall include representatives from Cochise County.

SEC. 5. GENERAL PROVISIONS.

(a) WITHDRAW FROM MINING.—Subject to valid existing rights, the lands described in section 1 are hereby withdrawn from all forms of appropriation under the public land laws, including mining and mineral leasing laws and the Geothermal Leasing Act.

(b) REGULATIONS.—The Secretary is authorized to issue regulations necessary to implement the provisions of this Act.

(c) VIOLATIONS OF ACT.—Any person who violates any provision of this Act or other regulations issued by the Secretary to implement this Act shall be subject to a fine of up to $10,000, or to imprisonment for up to one year, or both.

(d) COOPERATIVE AGREEMENTS.—The Secretary may enter into cooperative agreements with appropriate State and local agencies for enforcement of the provisions of this Act and regulations issued pursuant to it.

(e) ENDANGERED SPECIES ACT.—Nothing in this Act shall supersede or otherwise affect the Endangered Species Act of 1973 (16 U.S.C. 1530 et seq.).

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(f) ACQUISITION OF LANDS.—Nothing in this Act shall affect State or private inholdings within the boundaries of the conservation area as described by the Secretary except as they may be acquired by exchange or purchase but not by condemnation.

SEC. 6. REPORT TO CONGRESS.

No later than 5 years after the date of enactment of this Act and every 10 years thereafter, the Secretary shall furnish to the appropriate committees of the House of Representatives and the Senate, a report on the implementation of this Act. Such report shall include a detailed statement on the condition of the resources within the conservation area and the Bureau of Land Management's ability to achieve the management goals specified under this Act.

SEC. 7. AUTHORIZATION.

There are hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act.

O

FCSPRNCA1052

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
P.O. Box 16563
3707 N. 7th Street
Phoenix, Arizona 85011

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

7250 (932)

December 3, 1987

Mr. Lawrence A. Ramsey, Section Manager
Surface Water/Adjudication Section
Arizona Department of Water Resources
99 East Virginia Avenue
Phoenix, Arizona 85004

Dear Mr. Ramsey:

The Bureau of Land Management (BLM) wishes to amend Application for Permit to Appropriate Water No. 33-90103 for the uses and amounts specified in items 3 and 4 of the application that are needed to protect the natural values of the proposed San Pedro Riparian National Conservation Area.

The beneficial uses being applied for under item 3 are as follows:

-- wildlife and fisheries including wildlife and riparian habitat protection

-- recreation, including aesthetics

The amounts of water being applied for on Page "A" (attachment to Permit Application of Huachuca Audubon Society, et al) are amended by the amounts in the enclosed table (see enclosure). The flows represented in the table under Palominas coincide with the "Hereford to Charleston (Segment 1)" river segment in Page "A." Charleston/Tombstone flows in the table coincide with the "Charleston to a point 8 miles south of Benson (Segment 2)" river segment on Page "A."

We also wish to have the following explanatory information concerning the beneficial uses and amounts of water included in the application:

"The requested amounts of water are needed to maintain sufficient water supplies to sustain the natural values of the San Pedro River. The natural values of the San Pedro River are inextricably linked to available water. Riparian vegetation, wildlife, aquatic values and recreation attributes are all dependent upon instream flows (including floods and related groundwater conditions). Through an intensive,

FCSPRNCA1053

interdisciplinary analysis of the critical factors that affect water-dependent values, the BLM has determined these amounts to be necessary to protect the proposed San Pedro Riparian National Conservation Area."

Please note these changes for the record. If you have any questions, contact Dan McGlothlin of my staff at 241-5512.

Sincerely,

D. Dean Bibles
State Director

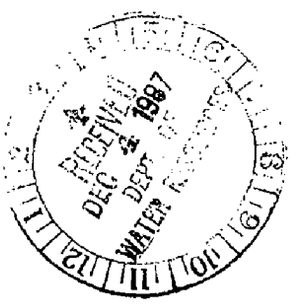
Enclosure

FCSPRNCA1054

Requested Instream Flows for the BLM San Pedro River Properties

Instream flows are expressed as a percentage of median daily flows for each month in the year. Median flows are believed to be more representative of daily flow conditions than mean flows because of the highly skewed nature of daily flow distributions. The annual San Pedro River flow regime is stratified into four distinct seasons. The April-June spring season is the primary low flow period, and the July-September summer season is the primary high (flood) flow period for the River. A secondary low flow period occurs during the fall (October-November), and a secondary high flow period occurs during the winter (December-March). The requested flows reflect consideration for historic base-flow declines.

Period	Month	Requested Flows, cfs	
		Palominas	Charleston/Tombstone
	Oct.	3.7	12.2
Fall	Nov.	3.6	13.6
	Dec.	5.5**	17.1**
	Jan.	7.9**	19.5**
Winter	Feb.	8.6**	20.3**
	Mar.	6.3**	18.9**
	April	2.5	12.2
Spring	May	1.2*	7.9*
	June	0.6*	4.2*
	July	7.0*	19.0*
Summer	Aug.	7.0*	19.0*
	Sept.	7.0*	19.0*



* This value or 60% of the water reaching the San Pedro River or its tributary water coarses including impoundments thereon, at any point in time.

** This value or 80% of the water reaching the San Pedro River or its tributary water coarses including impoundments thereon, at any point in time.

Enclosure

FCSPRNCA1055

ASSIGNMENT

One Assignment and $5.00 Fee to be Filed for Each Document

For valuable consideration, the undersigned hereby assigns and transfers subject to the conditions set out on the attached page,

XX Application to Appropriate Public Waters No. 33-90103
____ Permit to Appropriate No. _____
____ Certificate of Water Right No. _____
____ Water Rights Registration No. _____
____ Registration of Stockpond No. _____

together with all rights evidenced therein to Bureau of Land Management,
Assignee
Arizona State Office, 3707 N. 7th Street, Phoenix, Arizona 85014
Address

DATED this 22nd day of May, 1986.

Lori Potter
Assignor

1600 Broadway Street, Suite 1600
Denver, Colorado 80202
Address

Huachuca Audubon Society, c/o Lori Potter

STATE OF COLORADO)
County of Denver) ss.

The foregoing assignment was acknowledged and signed before me this 22nd day of May, 1986, by Lori Potter.

My commission expires:
January 29, 1990

Elizabeth Smith
Notary Public

ACCEPTANCE

The undersigned hereby accepts the assignment of the document described herein and agrees to be bound by the terms and conditions thereof.

DATED this 27th day of May, 1986.

D. Dean Bibles
Assignee

3707 N. 7th St., Phoenix, AZ 85014
Address

Bureau of Land Management, Arizona State Office

STATE OF ARIZONA)
County of MARICOPA) ss.

The foregoing instrument was acknowledged and signed before me this 27th day of May, 1986, by D. Dean Bibles.

My commission expires:
My Commission Expires Aug. 19, 1988

Barbara Jones
Notary Public

APPROVAL

Approved by and filed with the Arizona Department of Water Resources this date May 28, 1986.

Lawrence A. Ramsey
For: Director

FCSPRNCA1056

This Assignment is conditioned upon the following terms:

(1) Assignors Huachuca Audubon Society, Sierra Club, and Defenders of Wildlife shall remain parties to this proceeding with intervenor status, and shall be served with copies of all filings, pleadings, notices, and decisions;

(2) As intervenors in the proceeding, Assignors shall retain a joint interest in the Application until such time as DWR issues BLM a decreed water right. At such time, Assignee BLM shall be the sole owner of said water right;

(3) Should Assignee Bureau of Land Management move to dismiss this application, this application shall revert to Assignors;

(4) Assignee Bureau of Land Management shall promptly move to protect this application in the ongoing general adjudication for the Gila River basin, and shall serve Assignors with notice of such legal action; and

(5) Should Assignee abandon the water right which is decreed as a result of this Application, the water right shall revert to Assignors.

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

February 4, 1986

Lori Potter, Esq.
Sierra Club Legal Defense Fund, Inc.
1600 Broadway Street, Suite 1600
Denver, Colorado 80202

RE: Application to Appropriate No. 33-90103

Dear Ms. Potter:

Enclosed is a copy of a letter dated January 21, 1986 from Walter G. Parker, Acting Project Engineer of the San Carlos Irrigation Project, withdrawing their protest of the referenced application.

Very truly yours,

Lawrence A. Ramsey

Lawrence A. (Al) Ramsey
Branch Chief
Surface Water/Adjudication

LAR:bis
Enclosure

cc: Walter G. Parker

FCSPRNCA1058

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
SAN CARLOS IRRIGATION PROJECT
P.O. Box 250
Coolidge, Arizona 85228

RECEIVED
JAN 27 1986
WATER RESOURCES

IN REPLY REFER TO:

January 21, 1986

Mr. George A. Schade, Branch Chief
Surface Water/Adjudications
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85005

Re: Application for Permit to Appropriate Water No. 33-90103

Dear Mr. Schade:

By letter dated November 27, 1985, San Carlos Irrigation Project filed a protest in response to the subject application. San Carlos Irrigation Project hereby withdraws its protest to this application.

Sincerely,

Walter Parker

Act. Project Engineer

cc: Huachuca Audubon Society
Chiracahua Sierra Club
Defenders of Wildlife

FCSPRNCA1059

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

January 8, 1986

Ralph Esquerra, Project Engineer
San Carlos Irrigation Project
P. O. Box 250
Coolidge, Arizona 85228

RE: Application to Appropriate No. 33-90103

Dear Mr. Esquerra:

Enclosed is a copy of the response by Lori Potter, Attorney for Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, to your protest of the referenced application.

Very truly yours,

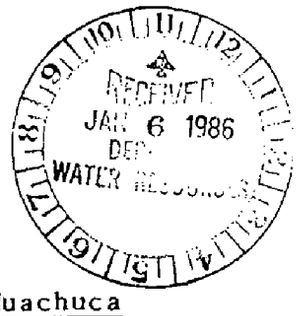
Lawrence A. Ramsey

Lawrence A. (Al) Ramsey
Branch Chief
Surface Water/Adjudication

LAR:bis
Enclosure

cc: Lori Potter, Esq.

FCSPRNCA1060



ARIZONA DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF APPLICATION TO APPROPRIATE PUBLIC WATERS OF THE STATE OF ARIZONA NO. 33-90103	Response of Huachuca Audubon Society et al. to Protest of San Carlos Irrigation Project on Application to Appropriate No. 33-90103
APPLICANTS: Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife	
SOURCE: San Pedro River	

Applicants' instream flow right on the San Pedro will not interfere with the rights of the Project, which are downstream on the Gila river. In an analogous case in which The Nature Conservancy appropriated an instream flow on a tributary upstream from the San Carlos Irrigation Project, DWR held that

> The proposed appropriations will not conflict with existing vested water rights, since there will be neither an actual, physical diversion or storage nor a substantial consumptive use of public waters. A.R.S. § 45-143(A).

In the Matter of the Applications to Appropriate Nos. 33-78419 and 33-78421 (April 29, 1983) at p. 8.

Therefore, DWR should deny the Project's protest.

Respectfully submitted,

LORI POTTER
SIERRA CLUB LEGAL DEFENSE FUND
1600 Broadway Street
Suite 1600
Denver, Colorado 80202
(303) 863-9898

Attorney for Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife

Dated: January 3, 1986

FCSPRNCA1061

Original and cc to:

George A. Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

cc: Ralph Esquerra
P.O. Box 250
Coolidge, Arizona 85228

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

January 6, 1986

John F. Molloy, Esq.
Molloy, Jones, Donahue,
Trachta, Childers & Mallamo, P.C.
P. O. Box 2268
Tucson, Arizona 85702

RE: Application to Appropriate No. 33-90103

Dear Mr. Molloy:

Enclosed is a copy of the response by Lori Potter, Attorney for Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, to your protest of the referenced application.

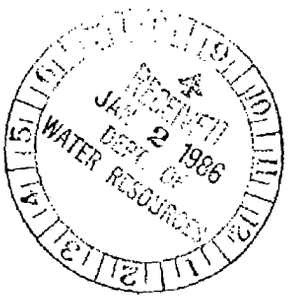
Very truly yours,

Lawrence A. (Al) Ramsey
Branch Chief
Surface Water/Adjudication

LAR:bis
Enclosure

cc: Lori Potter, Esq.

FCSPRNCA1063



ARIZONA DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF APPLICATION TO APPROPRIATE PUBLIC WATERS OF THE STATE OF ARIZONA NO. 33-90103 APPLICANTS: Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife SOURCE: San Pedro River	Response of Huachuca Audubon Society et al. to Protest of Tenneco West on Application to Appropriate No. 33-90103

On December 17, 1985 Applicants requested and received from Mr. George Schade an extension of time until January 2, 1985 to respond to this protest.

Applicants respond as follows:

1. Tenneco West is not a party which may be adversely affected by the approval of the application, as required by Article 13, R12-5-502(7). For many years, Tenneco West has been the riparian landowner along both sides of virtually the entire stretch of stream in which Applicants seek an instream flow right (hereafter, the "San Pedro corridor"). However, Tenneco has agreed to exchange those riparian lands with the United States Bureau of Land Management, which will create a federal refuge or recreation area there. (See Attachment A, BLM News Release describing the exchange.)

Therefore, since Tenneco has conveyed its interests in the land to BLM, Tenneco is not a "person who may be adversely affected by the approval of an application," R12-5-502(7). DWR should dismiss Tenneco's protest.

FCSPRNCA1064

2. The actual status of Tenneco's landholdings (i.e., the exchange of riparian lands from Tenneco to BLM) supports Applicants' request for an instream flow. Applicants have applied for an instream flow right for recreation and wildlife purposes. Members of the Huachuca Audubon Society, Chiracahua group of the Sierra Club, and Defenders of Wildlife use the San Pedro river corridor for wildlife viewing, bird-watching, hiking, picnicking, and related recreational activities. Tenneco's exchange of these lands into public ownership for refuge purposes makes Applicants' water right application even more appropriate and important. See Attachment B.

The river and riparian lands support over 150 species of resident and migrant birds. Arizona Game and Fish Commission. These include the Mississippi Kite, tropical kingbird, northern beardless flycatcher, zone-tailed hawk, gray hawk, Mexican duck, and black-bellied whistling duck, all listed as threatened by the Game and Fish Department. About one-third of the remaining pairs of gray hawks in the United States nest along the San Pedro between Hereford and St. David. See Attachment C. The San Pedro corridor is a portion of the southeast Arizona area which attracts birdwatchers from all over the country. See e.g. A Birder's Guide to Southeastern Arizona (L&P Press 1983).

The San Pedro river corridor also supports numerous small mammals, lizards and snakes, including the following species listed as threatened in Arizona: the Mexican garter snake, desert tortoise, yellow mud turtle, gila monster, Great Plains narrow-mouthed toad, and massasanga.

FCSPRNCA1065

Further, the San Pedro corridor contains habitat for the endangered ocelot, which the Arizona Game and Fish Department has observed in the area. A minimum streamflow through the corridor will enhance the possibility of reestablishing the ocelot population.

Two federal land management agencies (the U.S. Fish and Wildlife Service and BLM) and Arizona Game and Fish have exhaustively studied the San Pedro corridor as a potential park or refuge. See Attachment B.

Applicants, along with the government agencies, wish to preserve the bird and wildlife habitat along the river for recreational and wildlife purposes. Water is vital to maintenance of this habitat, and the river is the source of water for numerous species of birds and animals. Therefore, Tenneco's exchange of its riparian lands to the BLM for a park or refuge supports Applicants' purpose in appropriating a streamflow.

3. Tenneco's protest is not supported by the information required by Departmental regulation and should be dismissed.

In order to constitute a lawful protest to which Applicants can respond, a protest must contain the following information, as set forth on the Department's official Notice of Application to Appropriate Water, including the Application in this case (see attachment D):

> (1) Statement of the injury which would result to protestant from such appropriation and use.
>
> (2) The basis of protestant's water right, and date of initiation of the right.

FCSPRNCA1066

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Tenneco's protest does not contain any of the information required by points (1), (2), (3), (4) or (5) above. Applicants, Huachuca Audubon et al., cannot adequately respond to all aspects of Tenneco's protest without this information. Therefore, Applicants request that DWR dismiss Tenneco's protest for failing to give Applicants adequate notice of the elements of Tenneco's protest.

4. The San Pedro river has unappropriated waters available to appropriate for non-consumptive uses. Current stream gage records of the U.S. Geological Survey show that, as a general matter, there is water in the relevant stretch of the San Pedro river corridor at all times during the year. See Attachment E. The application of Huachuca Audubon Society et al. is based upon the existence of water in the stream to appropriate for non-consumptive uses. In other words, the water at a given point in relevant stretch of the river may be the return flow from one senior right, flowing downstream toward the diversion dam of another senior right, and while that water would clearly not be appropriable for a consumptive use, it is appropriable for a non-consumptive instream right. The non-consumptive right essentially exists to maintain the status quo and thereby protect

FCSPRNCA1067

riparian habitat for wildlife and recreational purposes. And, because the Huachuca Audubon Society's water right will clearly be junior to valid existing rights, there can be no interference with those rights. If granted, the Huachuca Audubon Society's water right will constitute a right to have in the stream segment an amount of water less than or equal to the amount appropriated, after valid senior rights have been satisfied.

5. Recreation and wildlife are beneficial uses of water under Arizona law. A.R.S. § 45-180, Definitions, states that:

> 1. 'Beneficial use' includes but is not limited to, use for domestic, municipal, recreation, wildlife, including fish, agricultural, mining, stock watering and power purposes.

§ 45-131(A) provides that the "waters of all sources, flowing in streams ... or other natural channels ... and of lakes, ponds and springs on the surface ... are subject to appropriation and beneficial use as provided in this chapter."

§ 45-141(A) lists beneficial uses as follows: "any person ... may appropriate unappropriated water for domestic, municipal, irrigation, stock watering, water power, recreation, wildlife, including fish, mining uses, for his personal use or for delivery to consumers." § 45-142(B) further supports the conclusion that recreation and wildlife are among the beneficial uses of water in Arizona. Subsection (B)(6) calls for a description of the location and character of the area to be used when an application seeks water for recreation or wildlife. The statute treats all other recognized beneficial uses (e.g. mining, power) similarly, calling for particular information specific to each different beneficial use See § 45-142(B).

FCSPRNCA1068

Finally, the conclusion that recreation and wildlife are beneficial uses is further underscored by § 45-147, relative value of uses, which ranks "recreation and wildlife" uses relative to others for purposes of resolving conflicts between pending applications.

Further, two cases support the position that recreation and wildlife uses are beneficial uses under Arizona law even if accomplished without a diversion. In McClellan v. Jantzen, 26 Ariz. App. 223, 547 P.2d 494 (1976), the court observed:

> In 1941 when 'wildlife, including fish' and in 1962 when 'recreation' were added to the purposes for appropriation, the concept of in situ appropriation of water was introduced -- it appearing to us that these purposes could be enjoyed without a diversion ...

Further, in the Ramsey Canyon decision (In the Matter of Applications to Appropriate Nos. 33-78419 and 33-78421) DWR granted The Nature Conservancy an instream flow right to "be used in situ for wildlife habitat preservation." Decision at p. 5. The Ramsey Canyon decision concluded as a matter of law that

> ... an actual, physical diversion and capture of public waters is not required to obtain an appropriative permit for recreation and wildlife, including fish, purposes based on continuous minimum instream water flows.

Id. at p. 8.

Like the Ramsey Canyon streamflow, a minimum flow in the San Pedro river will serve the interest and welfare of the public. See A.R.S. § 45-143(A). A minimum streamflow will protect the unique riparian habitat which state anad federal agencies, conservation groups, and private citizens are working to preserve as a refuge or park. See Attachment B.

FCSPRNCA1069

No statute or case requires that Applicants own the riparian lands in order to appropriate a minimum streamflow. Arizona law permits "any person" to appropriate water, § 45-141(A), and clearly permits a non-riparian appropriator to appropriate water from a source that exists on someone else's land and to use that water in situ, on non-riparian land, or even in a different watershed. The right of non-riparians to appropriate is one of the critical factors which distinguishes western water law from eastern, riparian rights water law. See Ariz. Const. art. 17, § 1; Getches, Water Law (1984).

The unappropriated waters of the San Pedro river are "waters of all sources ... [which] belong to the public and are subject to appropriation and beneficial use." § 45-131(A). The touchstone of a valid appropriation under Arizona water law is not land ownership but beneficial use, an element satisfied by an instream appropriation for recreation and wildlife. (See discussion at pp. 5-6 above.) "Beneficial use shall be the basis, measure and limit to the use of water." § 45-131(B).

Neither the Ramsey Canyon decision nor McClellan v. Jantzen relied on the applicant's landownership in order to find that the element of beneficial use had been met. In fact, McClellan implicitly approves the Game and Fish Department's water right on U.S. Forest Service land, thus confirming that land ownership is irrelevant to a valid appropriation in Arizona. 547 P.2d at 496. "... A water right is attached to the land on which it is beneficially used and becomes appurtenant thereto, and that right is not in any individual or owner of land." Salt River Valley Users' Ass'n v. Kovacovich, 3 Ariz. App. 28, 411 P.2d 201 (1966).

FCSPRNCA1070

Applicants will possess the San Pedro instream flow right in trust and for the benefit of parklands, just as the Game and Fish Department would own its water right on Sierra Blanca lake for the benefit of the national forest and its visitors.

Applicants Huachuca Audubon Society, Sierra Club, and Defenders of Wildlife are non-profit, public interest conservation organizations whose members work for the protection of wildlife and wildlife habitat. Applicants use the San Pedro river corridor for birdwatching, wildlife viewing, recreation, and related activities. Applicants have successfully worked to arrange the transfer into federal ownership of the riparian lands adjacent to their streamflow application. See Attachments A and B. As active and concerned members of the public, Applicants are appropriating water for a valid beneficial use which will benefit themselves, other members of the public who visit the federal park, and future generations. § 45-143(A).

Conclusion

Therefore, DWR should deny Tenneco's protest and confirm the instream flow water right of Huachuca Audubon, Sierra Club, and Defenders of Wildlife.

Respectfully submitted,

LORI POTTER
SIERRA CLUB LEGAL DEFENSE FUND
1600 Broadway Street
Suite 1600
Denver, Colorado 80202
(303) 863-9898

Attorney for Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife

FCSPRNCA1071

Original and cc to:

George A. Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

cc: John F. Molloy
Molloy, Jones, Donahue, Trachta,
Childers & Mallamo, P.C.
Arizona Bank Plaza
33 North Stone Avenue, Suite 2200
P.O. Box 2268
Tucson, Arizona 85702

DATED: December 31, 1985

San Pedro trail

ARIZONA DAILY STAR 8/13/85

Proposed land swaps will preserve treasure for the public

Visions of lakefront villas danced in the heads of Tenneco West Inc., bosses in the late 1960s when the conglomerate assembled Cochise County ranches on what was thought to become the shores of Charleston Lake.

Charleston Lake would be created on the San Pedro River by Charleston Dam, a component of the Central Arizona Project. Charleston Lake water would be piped northwest to Tucson, according to the CAP plan of 1968.

But Charleston Dam and Lake never happened. There were international problems to work out. The San Pedro flows north out of Mexico and the proposed lake might cross the international border as well. Preservationists were concerned about the rare vegetation and wildlife and the historic townsite of Charleston that would be inundated by the dam. Tucson negotiated for a share of Colorado River water instead.

And so, Tenneco West was left with a large parcel of land on either side of the San Pedro inhabited to this day only by cows. Cows don't sign lucrative mortgages for private boat docks on nonexistent lakes.

Now Tenneco has a chance to unload its San Pedro land. The Bureau of Land Management is willing to swap urban land it owns near Tucson, Phoenix and other cities for a chance to preserve the banks of the San Pedro.

If the land values work out right, Tenneco could wind up smelling like success. The company still might not be building boat docks, but it could be developing industrial property that will bring it more profit than it can earn in Cochise County.

And the public will benefit, too. The natural treasure that lies along the San Pedro will be preserved indefinitely and opened for them to enjoy. The most intriguing proposal is to develop a hiking trail that stretches all the way from Interstate 10 near Benson to the Mexican border 30 miles away.

The trail would be dotted with picnic and campsites beneath groves of towering cottonwood trees. The route could be accessible from several points, allowing for day hikes or treks that take several days to complete.

The trail would afford the chance for everyone to see what a 1978 U.S. Fish and Wildlife Service report described as "the richest assemblage of land mammal species in the entire United States."

The best part of the whole idea is that the land swaps can be carried out without wading through tons of red tape in Washington. The land can be protected immediately by authority already vested in the BLM. The state has long been interested in developing a park at the historical Quiburi Spanish presidio. The proposed land swap will preserve that opportunity, as well.

BLM pushes swap to transfer control of 'sensitive' land

THE ARIZONA REPUBLIC 8/14/85

38,000 acres on San Pedro River are rich in animal life; state, U.S. jurisdiction sought

By MARK SHAFFER
Arizona Republic Staff

The state director of the Bureau of Land Management and an official from a California corporation toured bureau land near Phoenix on Tuesday in hopes of making a trade to bring 38,000 ecologically sensitive acres along the San Pedro River under federal and state jurisdiction.

A report issued by the U.S. Fish and Wildlife Service in 1978 said the San Pedro has "the richest assemblage of land-mammal species in the entire United States." In addition, the area contains several significant historic and archaeological sites.

The land sought by the BLM is a mile-wide, 30-mile-long strip on both sides of the San Pedro east of Sierra Vista in Cochise County. The Sonoran and Chihuahuan deserts meet in the area of the river, which is also on migratory paths of many rare birds from Mexico to points north.

Dean Bibles, state director of the BLM, said the agency's office in Safford has been directed to research areas along the river for possible designation as to their environmental importance if the land swap is consummated.

He said it will take several months before an exchange proposal can be made by the federal agency to Tenneco West Inc. of Bakersfield, Calif., for the state and federal preserve. Accompanying Bibles on the Tuesday tour was Mel Jans, senior vice president of Tenneco West.

"Until further study and research, we do not know if an exchange can be made," Bibles said.

Jans was unavailable for comment.

The officials looked at about 10 parcels of land around the Valley, Bibles said. He said several of the tracts were in Rainbow Valley near Buckeye and had been considered by the Navajo Tribe after being offered by the BLM as settlement of a Navajo-Hopi land dispute.

Other public lands being considered by Tenneco for trade, Bibles said, are north of Sun City, near the White Tank Mountains west of Phoenix, near Apache Junction, and south of Tucson near the San Xavier Indian reservation. Tenneco will examine the lands outside the Valley at a later date, Bibles said.

Federal land exchanges with private groups are based on equal value by independent appraisal. The estimated value of the land along the San Pedro owned by Tenneco, which had been portions of two Spanish land grants in the early 1800s, is $20 million. Bibles said the BLM list of land is in

— Swap, B4

Swap

Continued from B1

excess of 15,000 acres, some valued at $10,000 to $12,000 an acre.

The state's interest in the area is centered on two proposed state parks, a Spanish presidio site called Quiburi and a ranch site near the community of Hereford where ancient man killed giant animals.

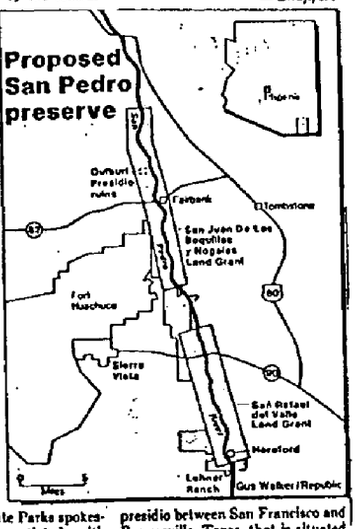
"These two pieces near the San Pedro are very important in the large picture of Arizona history," said Bern Shanks, a State Parks spokesman who has negotiated with Tenneco on behalf of the state.

The importance of acquiring the sites is magnified, Shanks said, by the fact that Arizona's six state parks of historic significance, with the exception of the Tubac Presidio, reflect history of the area only from the middle of the 19th century.

Shanks said Quiburi is the only presidio between San Francisco and Brownsville, Texas, that is situated in its "natural, wild setting."

Before construction of the presidio in the 1710s, the site had been an Indian village occupied by the ancestors of the Pima Tribe, he said.

In an area on the ranch near the San Pedro, archaeologists have found sites where 12 wooly mammoths were killed by hunters.



The Arizona Daily Star
Tucson, Wednesday, August 14, 1985

San Pedro refuge

BLM, property owner shop for land to swap

By Don Dale
The Arizona Daily Star

PHOENIX — A "positive and necessary step" was taken toward formation of a San Pedro River wildlife refuge yesterday, as officials showed off part of their proposed land swap.

Dean Bibles, state director of the U.S. Bureau of Land Management, took Mel Jans of Tenneco West Inc., owner of the San Pedro property, on an inspection flight over some BLM property here. BLM is offering the Phoenix-area land and other parcels for about 38,000 acres along the San Pedro in Cochise County.

"It's a very large proposal, and it will take some time to put (a deal) together," Bibles said after the inspection. He said the meeting was positive and that Jans expressed an interest in seeing other BLM land in Phoenix, Tucson and Cochise County areas before Tenneco would make a decision, which could be several months away.

Jans, who could not be reached for comment after the meeting, has said Tenneco is trying to sell the huge block of San Pedro River property — made up primarily of two 19th century Spanish land grants — and would consider trading for property it could sell.

"It's their first exposure" to several thousand acres of Phoenix-area land BLM is offering, Bibles said. Included was land near the White Tank Mountains west of Litchfield Park, in Rainbow Valley south of Buckeye, north of Sun City and in the Apache Junction area.

He said a "wild guess" of the value of the BLM land ranges from $400 to $12,000 per acre. All is undeveloped, much of it rangeland. Land in the Tucson and Phoenix areas is also being used to make up what BLM spokesman Bob Johns called a "shopping list" of properties from which Tenneco can select.

The BLM has not obtained a valuation of the San Pedro River property, but one conservationist said the prime wildlife habitat and historical sites could be worth as much as $20 million.

The land straddles the San Pedro River in a region scientists call the richest area for mammal diversity in North America. It also contains nesting sites for rare gray hawks, the Quiburi Spanish presidio site, and several potential recreational areas.

ATTACHMENT B

FCSPRNCA1073

FCSPRNCA1074

San Pedro Valley land swap proposed

SIERRA VISTA HERALD PG 2 8-12-85

PHOENIX (AP) — A federal land manager plans to make Tenneco West, Inc., officials an offer he hopes they can't refuse.

The future of an area described as one of America's richest wildlife habitats hinges on the outcome.

When Dean Bibles meets with Tenneco here tomorrow, he plans to offer to swap thousands of acres of public land near Tucson and Phoenix and in developed parts of Cochise County for about 38,000 acres of private land that straddles the San Pedro River.

The aim is preservation of the wildlife, historical and archaeological values of the San Pedro River Valley east of Sierra Vista, an area the U.S. Fish and Wildlife Service once described as offering "the richest assemblage of land mammal species in the entire United States."

It includes two Spanish land grants dating from 1827, the Quiburi Spanish presidio site and an area where ancient Indian spear points and mammoth fossils have been found.

Mel Jans, senior vice president of Tenneco West in Bakersfield, Calif., said his company's land is for sale and that Tenneco might be interested in a swap for land with sale potential. He also said he had no specific proposal from the Bureau of Land Management.

Bibles, the BLM director for Arizona, said he has the authority to make a deal and that he feels he has a good chance to bring it off.

He declined to cite specific acreages but said they might include land northwest of Litchfield Park, a 500-acre tract north of the San Xavier Indian Reservation and parcels near Sierra Vista and Tombstone.

Neither he nor Jans could estimate the value of the Tenneco holdings, but a conservationist put it at about $20 million.

Bibles said an independent appraisal would fix the respective values if an agreement is reached. He also said he already has asked for a list of criticial issues to be addressed along the San Pedro.

bern Shanks, the Arizona State Parks representative who approached Tenneco on behalf of the state at Gov. Bruce Babbitt's urging, said Arizona is interested in making the Quiburi site into a park.

Conversationists say that besides having a running river, the area is home to such fragile wildlife as the rare gray hawks that nest near Lewis Springs. It also is on the migration route for Mexican birds, including the black hawk.

The Sonoran and Chihuahuan deserts come together there, and so do the vegetation and wildlife of the Rocky Mountain and Sierra Madre Mountain ranges.

Shanks called the valley "sort of the biological Grand Canyon of the Southwest," saying it has one of the most ecologically diverse environments per mile of river of almost any place in the United States.

SEE BACK

BIOLOGICALLY SIGNIFICANT PORTIONS
OF THE
SAN PEDRO RIVER

The following are some of the most often discussed sites along the San Pedro River in terms of important plant and animal species and habitat types.

St. David to Hereford

The most important natural values of this portion are the riparian habitat and nesting Gray Hawks. The riparian habitat consists of a cottonwood dominated gallery forest with portion of the terrace along the river covered with mesquite bosques. Cottonwood forests and mesquite bosques of substantial size are becoming increasingly rare in Arizona as a result of a number of detrimental activities (firewood cutting, clearing for agriculture, groundwater pumping). Eleven Gray Hawk nests are scattered along the San Pedro from St. David upstream to a few miles south of Lewis Springs. Tenneco owns most of this stretch.

St. David Spring

This site is located about four miles south of St. David. It consists of a large marshy area fed by two springs. This an an unusual habitat type that was once common in the southeastern portions of the state but has been reduced to only a handful of sites. It along with Babocomari Cienega (located in an upstream tributary) represent the largest examples of this habitat remaining. The area is surrounded by a thick stand of sacaton and mesquite. Birdwatchers have visited the area for a number of years. Tenneco is the landowner.

Redington-Cascabel Mesquite Bosques

There are several excellent mesquite bosques upstream from Redington to a point about ten miles south of Cascabel. Recent flooding may have reduced the size of the stands. There are two Gray Hawk nests in the area. Mississippi Kites are also found here. Several landowners control these sites.

Bingham Swamp

This is a small marsh adjacent to the San Pedro River channel just north of Redington. It is an excellent example of a formerly widespread aquatic feature. Owned by a ranching operation that grazes cattle along the margin of the marsh.

ATTACHMENT C

FCSPRNCA1075

09471550 SAN PEDRO RIVER NEAR TOMBSTONE, AZ

LOCATION.--Lat 31°45'03", long 110°12'02", in SE¼ sec.28, T.19 S., R.21 E. (unsurveyed), Cochise County, Hydrologic Unit 15050202, in Spanish land grant of San Juan de las Boquillas y Nogales, on right bank 0.5 mi (0.8 km) downstream from Willow Wash, 2.6 mi (4.2 km) north of Fairbank, and 8 mi (13 km) northwest of Tombstone.

DRAINAGE AREA.--1,740 mi² (4,510 km²) approximately, of which 696 mi² (1,800 km²) is in Mexico.

PERIOD OF RECORD.--April 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,780 ft (1,152 m), from topographic map.

REMARKS.--Records fair. Diversions above station, mostly by pumping from ground water, for irrigation of 3,200 acres (13.0 km²) in 1978, excluding an unknown amount in Mexico.

AVERAGE DISCHARGE.--14 years, 48.6 ft³/s (1.376 m³/s), 35,210 acre-ft/yr (43.4 hm³/yr); median of yearly mean discharges, 41 ft³/s (1.16 m³/s), 29,700 acre-ft per year (37 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,200 ft³/s (685 m³/s) Oct. 9, 1977, gage height, 11.40 ft (3.475 m), from rating curve extended above 4,900 ft³/s (140 m³/s) on basis of slope-area measurements at gage heights 8.89 ft (2.710 m) and 11.40 ft (3.475 m). No flow at times during most summers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,640 ft³/s (160 m³/s) Aug. 1, 1715 hours, gage height, 6.77 ft (2.063 m), base discharge, 3,000 ft³/s (85 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	3.0	5.5	7.8	9.7	8.8	7.3	5.5	.00	14	1460	150
2	.00	3.0	5.5	7.8	9.7	9.3	7.1	5.5	.00	4.4	673	4.5
3	.00	3.7	5.5	8.3	9.7	13	7.2	5.2	.00	2.3	110	157
4	.00	3.7	5.5	8.4	9.7	10	7.1	3.7	.00	.45	50	375
5	.00	3.7	5.5	8.6	9.6	9.8	6.6	3.6	.00	.00	30	106
6	.00	4.3	5.5	8.5	9.7	10	6.5	3.4	.00	1.4	20	97
7	.00	4.3	5.5	10	9.8	10	6.3	3.4	.00	3.7	15	29
8	.00	4.3	5.3	9.7	9.7	9.6	6.0	3.1	.00	11	10	19
9	.00	4.3	5.3	9.8	9.6	9.3	5.9	3.0	.00	9.2	10	17
10	.00	4.3	5.4	9.6	10	9.2	5.9	2.9	.00	3.8	262	14
11	.00	4.3	5.8	9.7	9.6	9.1	5.8	2.6	.00	431	185	13
12	.00	4.3	5.5	11	9.3	9.1	5.8	2.4	.00	227	412	11
13	.00	4.3	6.2	11	9.1	9.0	5.9	2.3	.00	96	782	9.2
14	.00	4.3	5.9	10	9.0	8.8	5.7	2.0	.00	20	657	7.8
15	.00	4.3	6.0	9.7	9.1	8.6	5.6	1.8	.00	8.5	151	6.7
16	.00	6.2	6.0	11	8.9	8.8	5.8	1.7	.00	8.5	77	103
17	.00	4.9	6.0	11	8.9	8.7	5.9	1.7	.00	832	63	34
18	.00	4.3	6.0	10	8.8	8.4	6.2	1.7	.00	209	54	25
19	.00	4.3	6.2	10	8.3	9.6	5.4	1.5	.00	150	57	12
20	.00	4.9	6.7	10	8.3	10	5.1	.70	.00	104	33	5.0
21	.00	4.9	7.0	9.8	8.3	10	5.0	.00	.00	206	21	3.0
22	.00	4.9	7.2	10	8.2	9.5	5.0	.00	.00	426	14	.60
23	.00	4.9	7.3	10	8.3	9.0	5.1	.00	.00	349	11	.43
24	.00	4.9	7.3	10	8.4	8.8	5.6	.00	.00	433	7.9	1.1
25	.00	4.8	7.5	10	8.3	8.5	5.5	.00	.00	380	6.7	.44
26	.00	5.1	7.9	10	8.5	8.2	5.5	.00	.00	602	5.7	.00
27	.00	5.4	7.9	10	9.0	8.0	5.5	.00	.00	359	4.9	.00
28	.71	5.5	8.0	10	9.2	8.3	4.5	.00	.00	94	3.7	.00
29	2.0	5.5	8.2	10	---	7.9	4.0	.00	.00	303	3.0	1.8
30	2.3	5.5	8.0	9.8	---	7.7	4.0	.00	7.7	767	2.4	4.3
31	2.7	---	7.7	9.8	---	7.5	---	.00	---	1220	2.9	---
TOTAL	7.71	136.1	198.8	301.3	254.7	282.5	172.8	57.70	7.70	7235.25	5194.2	1206.17
MEAN	.25	4.54	6.41	9.72	9.10	9.11	5.76	1.86	.26	233	168	40.2
MAX	2.7	6.2	8.2	11	10	13	7.3	5.5	7.7	1220	1460	375
MIN	.00	3.0	5.3	7.8	8.2	7.5	4.0	.00	.00	.00	2.4	.00
AC-FT	15	270	394	598	505	560	343	114	15	14350	10300	2390

CAL YR 1980	TOTAL	4324.81	MEAN	11.8	MAX	420	MIN	.00	AC-FT	8580
WTR YR 1981	TOTAL	15054.93	MEAN	41.2	MAX	1460	MIN	.00	AC-FT	29860

FCSPRNCA1076

09471000 SAN PEDRO RIVER AT CHARLESTON, AZ

LOCATION.--Lat 31°37'33", long 110°10'26", in NE¼NE¼ sec.11, T.21 S., R.21 E., Cochise County, Hydrologic Unit 15050202, in Spanish land grant of San Juan de las Boquillas y Nogales, at downstream side of pier near center of highway bridge, 0.3 mi (0.5 km) south of Charleston, 1.5 mi (2.4 km) upstream from Charleston damsite, and 9 mi (14 km) upstream from Babocomari River.

DRAINAGE AREA.--1,219 mi² (3,157 km²), of which 696 mi² (1,803 km²) is in Mexico.

PERIOD OF RECORD.--January and February 1904 (gage heights only); March 1904 to August 1906; November 1910 to December 1911 (gage heights only); September 1912 to current year. Monthly discharge only October 1926 to May 1928 and December 1933 to April 1935, published in WSP 1313. Published as "near Lewis Springs" 1910-11, and as "near Fairbank" 1911-26.

REVISED RECORDS.--WSP 1119: 1939(M). WSP 1213: 1914, 1916(M), 1918(M), 1919, 1920(M), 1922-23(M). WSP 1283: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,954.01 ft (1,205.182 m) National Geodetic Vertical Datum of 1929. Prior to Dec. 1, 1942, nonrecording gage or water-stage recorder at various sites within 6.5 mi (10.5 km) downstream at different datums.

REMARKS.--Records fair. Diversions above station, mostly by pumping from ground water, for irrigation of 3,700 acres (13.0 km²) in 1978, excluding an unknown amount in Mexico. Record shows flow available at Charleston damsite.

AVERAGE DISCHARGE.--70 years (water years 1905, 1913-81), 59.7 ft³/s (1.691 m³/s), 43,250 acre-ft/yr (53.3 hm³/yr); median of yearly mean discharges, 50 ft³/s (1.42 m³/s), 36,200 acre-ft/yr (45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 98,000 ft³/s (2,780 m³/s) Sept. 28, 1926, gage height, 21.9 ft (6.68 m), site and datum then in use, by slope-area measurement of peak flow; minimum since 1928, 0.40 ft³/s (0.011 m³/s) June 7, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge (*) and peak discharges above base of 3,000 ft³/s (85 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
July 16	2230	3,080	87.2	5.60	1.707
Sept. 3	1900	*3,210	90.9	5.67	1.728

Minimum, 0.60 ft³/s (0.017 m³/s) June 23, gage height, 1.89 ft (0.576 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	5.2	8.0	9.5	9.5	9.0	8.0	5.8	3.6	18	634	5.3
2	3.4	5.2	8.0	9.0	9.5	9.5	7.5	5.8	3.8	30	440	9.5
3	3.4	5.2	8.5	9.5	9.5	11	7.0	5.5	3.2	5.8	40	191
4	3.4	5.5	9.0	9.5	9.5	10	6.7	5.2	3.0	3.2	30	157
5	3.4	5.8	9.0	9.5	10	10	6.7	5.2	3.0	1.6	20	70
6	3.4	5.8	9.0	9.5	9.5	10	6.4	5.2	2.8	1.4	15	24
7	3.4	5.8	9.0	10	9.0	10	6.1	4.9	2.8	56	15	10
8	3.4	5.8	8.5	11	9.5	10	6.1	4.3	2.2	14	10	10
9	3.6	5.8	8.5	10	9.5	10	6.1	4.3	2.0	4.6	10	9.0
10	3.6	5.8	8.5	9.5	10	9.5	5.8	4.0	1.8	18	10	9.0
11	3.6	6.1	8.5	9.5	9.5	9.5	5.8	4.0	1.8	421	125	8.0
12	3.8	6.1	9.5	11	9.5	9.5	5.8	4.0	1.6	183	330	8.0
13	4.0	6.4	9.0	11	9.5	9.0	5.8	3.8	1.6	127	656	7.0
14	4.0	6.4	9.5	10	9.5	9.0	5.8	3.8	1.6	60	250	7.0
15	4.3	6.4	9.0	9.5	9.5	9.0	6.3	3.4	1.6	35	50	6.0
16	4.6	6.4	9.0	10	8.5	9.0	6.3	3.6	1.2	176	30	6.0
17	4.9	6.4	9.0	10	8.5	9.0	6.3	3.4	1.4	552	20	5.0
18	4.6	6.4	8.5	9.0	8.5	11	6.2	3.4	1.8	110	15	5.0
19	4.6	6.4	8.5	9.0	8.5	11	6.2	3.2	1.6	50	50	4.0
20	4.6	6.4	8.5	9.0	9.0	10	6.2	3.0	1.6	30	24	4.0
21	4.9	6.4	8.5	9.0	8.5	9.5	6.1	3.0	1.4	50	16	3.5
22	4.9	6.4	8.5	9.0	9.0	9.5	6.0	3.0	1.2	70	14	3.0
23	4.6	6.4	8.0	9.0	8.5	9.0	5.8	3.0	.80	25	12	3.0
24	4.6	6.1	8.0	9.5	8.5	8.5	5.8	3.2	1.0	220	9.5	3.0
25	4.6	6.7	8.0	10	8.5	8.0	5.8	3.0	1.4	200	8.0	3.0
26	4.6	6.7	8.5	10	8.5	8.0	5.5	3.0	2.0	180	8.0	3.0
27	4.9	7.0	8.5	9.5	8.5	8.0	5.5	2.8	2.4	50	6.7	2.8
28	4.6	7.5	8.5	9.5	9.0	7.5	5.8	3.0	5.9	123	6.1	3.2
29	4.9	8.0	8.5	9.5	---	8.0	5.5	3.6	3.8	224	5.8	6.8
30	4.9	8.5	9.0	10	---	8.0	5.5	3.8	108	295	5.8	4.0
31	4.9	---	9.0	10	---	8.0	---	3.4	---	642	5.5	---
TOTAL	129.8	189.0	268.0	300.0	255.0	287.0	184.4	120.6	171.90	3975.6	2871.4	590.1
MEAN	4.19	6.30	8.65	9.68	9.11	9.26	6.15	3.89	5.73	128	92.6	19.7
MAX	4.9	8.5	9.5	11	10	11	8.0	5.8	108	642	656	191
MIN	3.4	5.2	8.0	9.0	8.5	7.5	5.5	2.8	.80	1.4	5.5	2.8
AC-FT	257	375	532	595	506	569	366	239	341	7890	5700	1170

CAL YR 1980	TOTAL	4617.60	MEAN 12.6	MAX 287	MIN 1.6	AC-FT	9160	
WTR YR 1981	TOTAL	9342.80	MEAN 25.6	MAX 656	MIN .80	AC-FT	18530	

ATTACHMENT E

FCSPRNCA1077

ARIZONA
BLM
BUREAU OF LAND MANAGEMENT
UNITED STATES DEPARTMENT OF THE INTERIOR

FOR RELEASE IMMEDIATELY DEC 29 1985

CONTACT Erick Campbell, 428-4040

News Release

SAFFORD BLM TO HOLD WORKSHOPS ON MANAGEMENT

OF SAN PEDRO LAND GRANTS

RECEIVED DEC 30 1985

The Bureau of Land Management's Safford District will be holding three public workshops on the future management of the San Pedro land grants. BLM is currently engaged in exchanging public lands west of Phoenix for these privately-owned lands in western Cochise County.

District Manager Lester Rosenkrance encourages interested persons to attend the workshops. The workshops are intended to gather information and concerns on BLM's future management of about 44,000 acres in and adjacent to the land grants on the San Pedro River south of Benson. This area, containing extensive riparian forests, prehistoric and historic ruins, and varied wildlife, also has great potential for a variety of recreational activities. By identifying their concerns, members of the public will be able to help BLM in determining future management strategies. Upon completion of the land exchange, BLM will prepare a formal management plan for this area, incorporating the concerns expressed at the workshops.

All workshops will begin at 7:00 p.m. The dates and locations of the workshops are as follows:

Wednesday, January 8, 1986
Tucson Public Library
Columbus Branch
4350 East 22nd Street
Tucson, Arizona

Thursday, January 9, 1986
Oscar Yrun Community Center
3020 Tacoma Drive
Sierra Vista, Arizona

Thursday, January 16, 1986
BLM Arizona State Office
2nd Floor Conference Room
3707 North 7th Street
Phoenix, Arizona

Written comments from those unable to attend the workshops will also be accepted until February 28, 1986. To comment or request further information, contact Erick Campbell, Planning Team Leader, Bureau of Land Management, 425 East 4th Street, Safford, Arizona 85546 or call (602) 428-4040.

- 30 -

FCSPRNCA1078

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 filed Application No. 33-90103 with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona.

October 8, 19 85

Date of Posting

Arizona Department of
Water Resources

kp

21-73

ATTACHMENT D

FCSPRNCA1079

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

December 20, 1985

Michael D. Goyer, City Manager
City of Sierra Vista
2400 East Tacoma Street
Sierra Vista, Arizona 85635

RE: Application to Appropriate No. 33-90103

Dear Mr. Goyer:

Enclosed is a copy of the response by Lori Potter, Attorney for the Sierra Club Legal Defense Fund, to your protest of the referenced application.

Very truly yours,

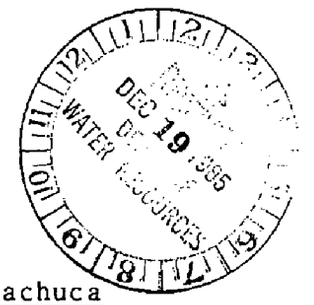
George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

cc: Lori Potter, Esq.

FCSPRNCA1080



ARIZONA DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF APPLICATION TO APPROPRIATE PUBLIC WATERS OF THE STATE OF ARIZONA NO. 33-90103 APPLICANTS: Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife SOURCE: San Pedro River	Response of Huachuca Audubon Society et al. to Protest of Michael Goyer, City Manager of Sierra Vista, on Application to Appropriate No. 33-90103

The Sierra Vista City Manager has filed a response to Applicants' application that does not meet the Department's requirements for a protest. Mr. Goyer's letter states:

> We have on file Application Nos. 33-89137, 33-89138, 33-89139 to appropriate surface water tributary to the San Pedro River, and have filed an application to appropriate ground water of the upper San Pedro River Basin. It does not appear to us that the reference application, whether surface or ground water, would affect or conflict with our filings. If the Department of Water Resources concurs in our presumption, we do not protest. However, if our presumption is incorrect, either from a physical or legal aspect, we do protest and would formally file as requested.

In order to constitute a lawful protest to which Applicants can respond, a protest must contain the following information, as set forth on the Department's official Notice of Application to Appropriate Water, including the Application in this case (see attachment):

> (1) Statement of the injury which would result to protestant from such appropriation and use.
>
> (2) The basis of protestant's water right, and date of initiation of the right.
>
> (3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

FCSPRNCA1081

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

The Sierra Vista City Manager's letter fails to state either the intended place of use or point of diversion for Sierra Vista's filings. The letter also fails to give a statement of the injury which would result to Sierra Vista from Applicant's water right. The letter also fails to give a basis for Sierra Vista's claims or the date of initiation or filing for its claimed rights.

Therefore, Applicants Huachuca Audubon et al. request that the Department dismiss the Sierra Vista City Manager's protest for failing to give Applicants adequate notice of the elements of Sierra Vista's protest. If the Department should deny this request, Applicants respectfully request the Department require Sierra Vista to resubmit a protest complying with the rules, and give Applicants an additional 30 days in which to respond. Applicants further request that the Department supply them with a copy of any correspondence between the Department and Sierra Vista resulting from the City Manager's November 14, 1985 letter and containing the Department's views on the relationship between Sierra Vista's claims and Audubon's Application herein.

Dated: December 17, 1985

FCSPRNCA1082

Respectfully submitted,

LORI POTTER
SIERRA CLUB LEGAL DEFENSE FUND
1600 Broadway Street
Suite 1600
Denver, Colorado 80202
(303) 863-9898

Attorney for Huachuca Audubon
Society, Chiracahua Sierra Club,
and Defenders of Wildlife

Original and cc to:

George A. Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

cc: Michael Goyer
City of Sierra Vista
2400 E. Tacoma Street
Sierra Vista, Arizona 85635

FCSPRNCA1083

Respectfully submitted,

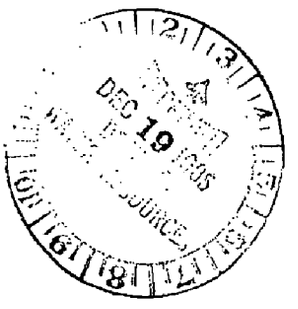
LORI POTTER
SIERRA CLUB LEGAL DEFENSE FUND
1600 Broadway Street
Suite 1600
Denver, Colorado 80202
(303) 863-9898

Attorney for Huachuca Audubon
Society, Chiracahua Sierra Club,
and Defenders of Wildlife

Original and cc to:

George A. Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

cc: Michael Goyer
City of Sierra Vista
2400 E. Tacoma Street
Sierra Vista, Arizona 85635



FCSPRNCA1084

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiricahua Sierra Club, and Defenders of Wildlife, filed (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 Application No. 33-90103, with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona

October 8, 19 85

Arizona Department of
Water Resources

Date of Posting _____

kp

21-73

FCSPRNCA1085

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

December 16, 1985

Wayne Gustafson
St. David Irrigation District Board
P. O. Box 463
St. David, Arizona 85630

RE: Application to Appropriate No. 33-90103

Dear Mr. Gustafson:

Enclosed is a copy of the response by Lori Potter, Attorney for the Sierra Club Legal Defense Fund, to your protest of the referenced application.

Very truly yours,

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

cc: Lori Potter, Esq.

FCSPRNCA1086

ARIZONA DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF APPLICATION TO APPROPRIATE PUBLIC WATERS OF THE STATE OF ARIZONA NO. 33-90103	Response of Huachuca Audubon Society et al. to Protest of St. David Irr. Dist. on Application to Appropriate No. 33-90103
APPLICANTS: Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife	
SOURCE: San Pedro River	

St. David Irrigation District raises the objection that applicants' instream flow application may interfere with its senior irrigation rights. This objection is unfounded, as is discussed more fully below.

1. Current stream gage records of the U.S. Geological Survey show that, as a general matter, there is water in the relevant stretch of the San Pedro River at all times during the year. See Attachment A. Huachuca Audubon Society's application is based upon the existence of water in the stream to appropriate for non-consumptive uses. Because the Huachuca Audubon Society's water right will clearly be junior to St. David's, and moreover will be non-consumptive, there can be no interference with that right. If granted, the Huachuca Audubon Society's water right will constitute a right to have an amount of water, less than or equal to the amount appropriated, in the stream segment after St. David Irrigation District has satisfied its valid senior rights.

2. The pendency of the general adjudication of water rights in the basin and of significant claims for reserved water rights by the Gila River tribe downstream makes it substantially likely

FCSPRNCA1087

that the water right of the Huachuca Audubon Society can be satisfied, due to the call that those downstream rights would put on the San Pedro river. Thus, St. David Irrigation District cannot show that the water right of Huachuca Audubon will not be fulfilled or should not be granted.

Therefore, the Department should grant the application of Huachuca Audubon for an instream flow in the San Pedro river.

Dated: December 11, 1985

Respectfully submitted,

LORI POTTER
SIERRA CLUB LEGAL DEFENSE FUND
1600 Broadway Street
Suite 1600
Denver, Colorado 80202
(303) 863-9898

Attorney for Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife

cc: Wayne Gustafson
St. David Irrigation District
P.O. Box 463
St. David, Arizona 85630

George A. Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

FCSPRNCA1088

1781

09471000 SAN PEDRO RIVER AT CHARLESTON, AZ

LOCATION.--Lat 31°37'33", long 110°10'26", in NE¼NE¼ sec.11, T.21 S., R.21 E., Cochise County, Hydrologic Unit 15050202, in Spanish land grant of San Juan de las Boquillas y Nogales, at downstream side of pier near center of highway bridge, 0.3 mi (0.5 km) south of Charleston, 1.5 mi (2.4 km) upstream from Charleston damsite, and 9 mi (14 km) upstream from Babocomari River.

DRAINAGE AREA.--1,219 mi² (3,157 km²), of which 696 mi² (1,803 km²) is in Mexico.

PERIOD OF RECORD.--January and February 1904 (gage heights only); March 1904 to August 1906; November 1910 to December 1911 (gage heights only); September 1912 to current year. Monthly discharge only October 1926 to May 1928 and December 1933 to April 1935, published in WSP 1313. Published as "near Lewis Springs" 1910-11, and as "near Fairbank" 1911-26.

REVISED RECORDS.--WSP 1119: 1939(M). WSP 1713: 1914, 1916(M), 1918(M), 1919, 1920(M), 1922-23(M). WSP 1283: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,954.01 ft (1,205.182 m) National Geodetic Vertical Datum of 1929. Prior to Dec. 1, 1942, nonrecording gage or water-stage recorder at various sites within 6.5 mi (10.5 km) downstream at different datums.

REMARKS.--Records fair. Diversions above station, mostly by pumping from ground water, for irrigation of 3,200 acres (13.0 km²) in 1978, excluding an unknown amount in Mexico. Record shows flow available at Charleston damsite.

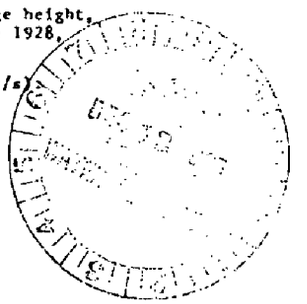
AVERAGE DISCHARGE.--70 years (water years 1905, 1913-81), 59.7 ft³/s (1.691 m³/s), 43,250 acre-ft/yr (53.3 hm³/yr); median of yearly mean discharges, 50 ft³/s (1.42 m³/s), 36,200 acre-ft/yr (45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 98,000 ft³/s (2,780 m³/s) Sept. 28, 1926, gage height, 21.9 ft (6.68 m), site and datum then in use, by slope-area measurement of peak flow; minimum since 1928, 0.40 ft³/s (0.011 m³/s) June 7, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge (*) and peak discharges above base of 3,000 ft³/s (85 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
July 16	2230	3,080	87.2	5.60	1.707
Sept. 3	1900	*3,210	90.9	5.67	1.728

Minimum, 0.60 ft³/s (0.017 m³/s) June 23, gage height, 1.89 ft (0.576 m).



DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	5.2	8.0	9.5	9.5	9.0	8.0	5.8	3.6	18	634	5.3
2	3.4	5.2	8.0	9.0	9.5	9.5	7.5	5.8	3.8	30	440	9.5
3	3.4	5.2	8.5	9.5	9.5	11	7.0	5.5	3.2	5.8	40	191
4	3.4	5.5	9.0	9.5	9.5	10	6.7	5.2	3.0	3.2	30	157
5	3.4	5.8	9.0	9.5	10	10	6.7	5.2	3.0	1.6	20	70
6	3.4	5.8	9.0	9.5	9.5	10	6.4	5.2	2.8	1.4	15	24
7	3.4	5.8	9.0	10	9.0	10	6.1	4.9	2.8	56	15	10
8	3.4	5.8	8.5	11	9.5	10	6.1	4.3	2.2	14	10	10
9	3.6	5.8	8.5	10	9.5	10	6.1	4.3	2.0	4.6	10	9.0
10	3.6	5.8	8.5	9.5	10	9.5	5.8	4.0	1.8	18	10	9.0
11	3.6	6.1	8.5	9.5	9.5	9.5	5.8	4.0	1.8	421	125	8.0
12	3.8	6.1	9.5	11	9.5	9.5	5.8	4.0	1.6	183	330	8.0
13	4.0	6.4	9.0	11	9.5	9.0	5.8	3.8	1.6	127	656	7.0
14	4.0	6.4	9.5	10	9.5	9.0	5.8	3.8	1.6	60	250	7.0
15	4.3	6.4	9.0	9.5	9.5	9.0	6.3	3.4	1.6	35	50	6.0
16	4.6	6.4	9.0	10	8.5	9.0	6.3	3.6	1.2	176	30	6.0
17	4.9	6.4	9.0	10	8.5	9.0	6.3	3.4	1.4	552	20	5.0
18	4.6	6.4	8.5	9.0	8.5	11	6.2	3.4	1.8	110	15	5.0
19	4.6	6.4	8.5	9.0	8.5	11	6.2	3.2	1.6	50	50	4.0
20	4.6	6.4	8.5	9.0	9.0	10	6.2	3.0	1.6	30	24	4.0
21	4.9	6.4	8.5	9.0	8.5	9.5	6.1	3.0	1.4	50	16	3.5
22	4.9	6.4	8.5	9.0	9.0	9.5	6.0	3.0	1.2	70	14	3.0
23	4.6	6.4	8.0	9.0	8.5	9.0	5.8	3.0	.80	25	12	3.0
24	4.6	6.3	8.0	9.5	8.5	8.5	5.8	3.2	1.0	220	9.5	3.0
25	4.6	6.7	8.0	10	8.5	8.0	5.8	3.0	1.4	200	8.0	3.0
26	4.6	6.7	8.5	10	8.5	8.0	5.5	3.0	2.0	180	8.0	3.0
27	4.9	7.0	8.5	9.5	8.5	8.0	5.5	2.8	2.4	50	6.7	2.8
28	4.6	7.5	8.5	9.5	9.0	7.5	5.8	3.0	5.9	123	6.1	3.2
29	4.9	8.0	8.5	9.5	---	8.0	5.5	3.6	3.8	224	5.8	6.8
30	4.9	8.5	9.0	10	---	8.0	5.5	3.8	108	295	5.8	4.0
31	4.9	---	9.0	10	---	8.0	---	3.4	---	642	5.5	---
TOTAL	129.8	189.0	268.0	300.0	255.0	287.0	184.4	120.6	171.90	3975.6	2871.4	590.1
MEAN	4.19	6.30	8.65	9.68	9.11	9.26	6.15	3.89	5.73	128	92.6	19.7
MAX	4.9	8.5	9.5	11	10	11	8.0	5.8	108	642	656	191
MIN	3.4	5.2	8.0	9.0	8.5	7.5	5.5	2.8	.80	1.4	5.5	2.8
AC-FT	257	375	532	595	506	569	366	239	341	7890	5700	1170

CAL YR 1980 TOTAL 4617.60 MEAN 12.6 MAX 287 MIN 1.6 AC-FT 9160
WTR YR 1981 TOTAL 9342.80 MEAN 25.6 MAX 656 MIN .80 AC-FT 18530

FCSPRNCA1089

09471550 SAN PEDRO RIVER NEAR TOMBSTONE, AZ

LOCATION.--Lat 31°45'03", long 110°12'02", in SE¼ sec.28, T.19 S., R.21 E. (unsurveyed), Cochise County, Hydrologic Unit 15050702, in Spanish land grant of San Juan de las Boquillas y Nogales, on right bank 0.5 mi (0.8 km) downstream from Willow Wash, 2.6 mi (4.2 km) north of Fairbank, and 8 mi (13 km) northwest of Tombstone.

DRAINAGE AREA.--1,740 mi² (4,510 km²) approximately, of which 696 mi² (1,800 km²) is in Mexico.

PERIOD OF RECORD.--April 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,780 ft (1,152 m), from topographic map.

REMARKS.--Records fair. Diversions above station, mostly by pumping from ground water, for irrigation of 3,200 acres (13.0 km²) in 1978, excluding an unknown amount in Mexico.

AVERAGE DISCHARGE.--14 years, 48.6 ft³/s (1.376 m³/s), 35,210 acre-ft/yr (43.4 hm³/yr); median of yearly mean discharges, 41 ft³/s (1.16 m³/s), 29,700 acre-ft per year (37 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,200 ft³/s (685 m³/s) Oct. 9, 1977, gage height, 11.40 ft (3.475 m), from rating curve extended above 4,900 ft³/s (140 m³/s) on basis of slope-area measurements at gage heights 8.89 ft (2.710 m) and 11.40 ft (3.475 m). No flow at times during most summers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,640 ft³/s (160 m³/s) Aug. 1, 1715 hours, gage height, 6.77 ft (2.063 m), base discharge, 3,000 ft³/s (85 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	3.0	5.5	7.8	9.7	8.8	7.3	5.5	.00	14	1460	150
2	.00	3.0	5.5	7.8	9.7	9.3	7.1	5.5	.00	4.4	673	4.5
3	.00	3.7	5.5	8.3	9.7	13	7.2	5.2	.00	2.3	110	157
4	.00	3.7	5.5	8.4	9.7	10	7.1	3.7	.00	.45	50	375
5	.00	3.7	5.5	8.6	9.6	9.8	6.6	3.6	.00	.00	30	106
6	.00	4.3	5.5	8.5	9.7	10	6.5	3.4	.00	1.4	20	97
7	.00	4.3	5.5	10	9.8	10	6.3	3.4	.00	3.7	15	29
8	.00	4.3	5.3	9.7	9.7	9.6	6.0	3.1	.00	11	10	19
9	.00	4.3	5.3	9.8	9.6	9.3	5.9	3.0	.00	9.2	10	17
10	.00	4.3	5.4	9.6	10	9.2	5.9	2.9	.00	3.8	262	14
11	.00	4.3	5.8	9.7	9.6	9.1	5.8	2.6	.00	411	185	33
12	.00	4.3	5.5	11	9.3	9.1	5.8	2.4	.00	227	412	11
13	.00	4.3	6.2	11	9.1	9.0	5.9	2.3	.00	96	782	9.2
14	.00	4.3	5.9	10	9.0	8.8	5.7	2.0	.00	20	657	7.8
15	.00	4.3	6.0	9.7	9.1	8.6	5.6	1.8	.00	8.5	151	6.7
16	.00	6.2	6.0	11	8.9	8.8	5.8	1.7	.00	8.5	77	103
17	.00	4.9	6.0	11	8.9	8.7	5.9	1.7	.00	832	63	34
18	.00	4.3	6.0	10	8.8	8.4	6.2	1.7	.00	209	54	25
19	.00	4.3	6.2	10	8.3	9.6	5.4	1.5	.00	150	57	12
20	.00	4.9	6.7	10	8.3	10	5.1	.70	.00	104	33	5.0
21	.00	4.9	7.0	9.8	8.3	10	5.0	.00	.00	206	21	3.0
22	.00	4.9	7.2	10	8.2	9.5	5.0	.00	.00	426	14	.60
23	.00	4.9	7.3	10	8.3	9.0	5.1	.00	.00	349	11	.43
24	.00	4.9	7.3	10	8.4	8.8	5.6	.00	.00	413	7.9	1.1
25	.00	4.8	7.5	10	8.3	8.5	5.5	.00	.00	380	6.7	.44
26	.00	5.1	7.9	10	8.5	8.2	5.5	.00	.00	602	5.7	.00
27	.00	5.4	7.9	10	9.0	8.0	5.5	.00	.00	359	4.9	.00
28	.71	5.5	8.0	10	9.2	8.3	4.5	.00	.00	94	3.7	.00
29	2.0	5.5	8.2	10	---	7.9	4.0	.00	.00	303	3.0	1.1
30	2.3	5.5	8.0	9.8	---	7.7	4.0	.00	7.7	767	2.4	4.3
31	2.7	---	7.7	9.8	---	7.5	---	.00	---	1220	2.9	---
TOTAL	7.71	136.1	198.8	301.3	254.7	282.5	172.8	57.70	7.70	7235.25	5194.2	1206.17
MEAN	.25	4.54	6.41	9.72	9.10	9.11	5.76	1.86	.26	233	168	40.2
MAX	2.7	6.2	8.2	11	10	13	7.3	5.5	7.7	1220	1460	375
MIN	.00	3.0	5.3	7.8	8.2	7.5	4.0	.00	.00	.00	2.4	.00
AC-FT	15	270	394	598	505	560	343	114	15	14350	10300	2390

CAL YR 1980 TOTAL 4324.81 MEAN 11.8 MAX 420 MIN .00 AC-FT 8580
WTR YR 1981 TOTAL 15054.93 MEAN 41.2 MAX 1460 MIN .00 AC-FT 29860

FCSPRNCA1090

United States Department of the Interior

FISH AND WILDLIFE SERVICE
POST OFFICE BOX 1306
ALBUQUERQUE, N.M. 87103

DEC 9 1985

SE

2-21-86-F-8

Memorandum

To: Assistant Regional Director, AWR, Region 2 (RE)

From: Acting Regional Director, Region 2 (AFF)

Subject: Biological Opinion for Acquisition of Wildlife Habitat Along the San Pedro River, Cochise County, Arizona

This responds to your request of October 29, 1985, for formal intra-Service Secton 7 consultation on the acquisition of 35,000 acres of wildlife habitat along the San Pedro River in Cochise County, Arizona.

Your proposal involves the withdrawal of Bureau of Land Management land along the San Pedro River to form a new national wildlife refuge. This proposal may affect the following species:

Ocelot (Felis pardalis)
Jaguarundi (Felis yagouroundi cacomitli)
Peregrine falcon (Falco peregrinus)
Gila topminnow (Poeciliopsis o. occidentalis)
Loach minnow (Tiaroga cobitis) (proposed)
Spikedace (Meda fulgida) (proposed)

The withdrawal is contingent upon the present landowner exchanging the subject lands for BLM lands elsewhere. The establishment of a national wildlife refuge on these lands would preserve them as natural wildlife habitat. Important riparian values would also be protected and a potential reintroduction site for native fish would be provided.

It is my biological opinion that this action is not likely to jeopardize the continued existence of the ocelot, jaguarundi, peregrine falcon, and Gila topminnow, but will promote the conservation of these species. This action will also benefit the proposed loach minnow and spikedace.

Should this action, as now planned, be modified or altered, or should new information become available, please reinitiate consultation.

Jerry X. Stegman

cc: Director, Arizona Game and Fish Department, Phoenix, Arizona
Director, FWS, Washington, D.C. (OES)
Field Supervisor, Ecological Services Field Office, Phoenix, Arizona

FCSPRNCA1091

Literature Cited

Gavin, T.A. 1973. An ecological survey of a mesquite bosque. Unpub. MS Thesis. University of Arizona. Tucson, AZ. 67 pp.

Glinski, R.L. 1977. An introduction to the raptors and habitat of the San Pedro River. Unpub. Report. 6 pp.

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Ohmart, R.D. 1982. Biotic uniqueness of the San Pedro River and area on the San Pedro Ranch. Cochise County, Arizona. Unpub. Report. 9 pp.

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_____1981. Riparian ecosystems: their ecology and status. OBS-81/17. 155 pp.

FCSPRNCA1092

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

December 5, 1985

Lori Potter, Esq.
Sierra Club Legal Defense Fund, Inc.
1600 Broadway Street, Suite 1600
Denver, Colorado 80202

RE: Application to Appropriate No. 33-90103

Dear Ms. Potter:

Enclosed is a copy of the protest submitted by Ralph Esquerra, Project Engineer of the San Carlos Irrigation Project.

You may file a written response within thirty days of the date of this letter. Please send Mr. Esquerra a copy of your response and file the original and one copy of your response with the Department of Water Resources.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

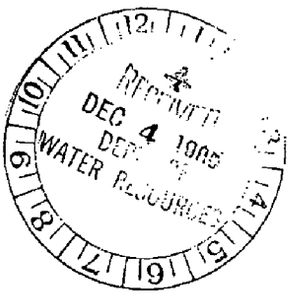
cc: Ralph Esquerra

FCSPRNCA1093

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
SAN CARLOS IRRIGATION PROJECT
P.O. Box 250
Coolidge, Arizona 85228

IN REPLY REFER TO:

November 27, 1985



Richard A. Gessner
Chief, Records Section
Department of Water Resources
99 E. Virginia, Suite 100
Phoenix, Arizona 85004

Dear Mr. Gessner:

Reference is made to Application No. 33-90103 filed by Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, Denver, CO for permit to appropriate public water of the State of Arizona and/or construct a reservoir and store water for beneficial use. The source of the water supply is the San Pedro River. The proposed use and amount applied for is for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses comtemplate the maintenance of a continuous minimum instream flow. The application states that "there will be no diversion; entire appropriation is for use instream."

If this application is approved it would deprive the Indian and non-Indian water users of the San Carlos Irrigation Project, Bureau of Indian Affairs, water that has been used on certain of the Indian lands since time immemorial and on the non-Indian lands since as early as 1868. This is evidenced by the United States District Court in the Decree entered June 29, 1935 known as Globe Equity No. 59 (Gila Decree).

Waters of the Gila River and its tributaries have long been over appropriated and in most water years the irrigation water is in extremely short supply and much of the Project lands must remain idle because of the insufficient water supply.

It is believed that the approval of this application would result in the diminution of water of the Gila River and thus the rights of the San Carlos Irrigation Project water users would be adversely affected.

Waters of the Gila River and its tributaries are delivered directly to Project lands located in Townships 4, 5, 6 and 7 South, and Ranges 4, 5, 6, 7, 8, 9 and 10 East, and to reservation lands lying in Townships 1 and 2 South, Ranges 1 and 2 East. All such waters are delivered to the

FCSPRNCA1094

described lands to the extent of all such water available. All deliveries are for irrigation purposes. The points of diversion are located in the NW¼ of Sec. 8, T4S, R11E (Ashurst-Hayden Dam), near the SW Corner of Section 7, T4S, R7E, (Olberg Dam); in Section 25, T2S, R2E, (Upper Gila Crossing Dam); and in Section 16, T2S, R2E, (Lower Gila Crossing Dam).

Sincerely,

Project Engineer

cc: Huachuca Audubon Society
Chiracahua Sierra Club
Defenders of Wildlife
820 16th Street, Suite 514
Denver, CO 80202

FCSPRNCA1095

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

November 26, 1985

Lori Potter, Esq.
Sierra Club Legal Defense Fund, Inc.
1600 Broadway Street, Suite 1600
Denver, Colorado 80202

RE: Application to Appropriate 33-90103

Dear Ms. Potter:

Enclosed is a copy of the protest submitted by John F. Molloy, Esq., on behalf of Tenneco West, Inc.

You may file a written response within thirty days from the date of this letter. Please send Mr. Molloy a copy of your response and file the original and one copy of your response with the Department of Water Resources.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

cc: John F. Molloy, Esq.

FCSPRNCA1096

SIERRA CLUB

Grand Canyon Chapter · Arizona

Rt 1 Box 254, McNeal Arizona 85617

NOV 1985
DEPARTMENT OF WATER RESOURCES

25 November 1985

Mr George A Schade, Jr.
Department of Water Resources
99 E. Virginia Avenue
Phoenix, Arizona 85004

Re. Application to Appropriate
No. 33-90103

Dear Mr Schade:

Enclosed please find the Affidavit of Posting Notice and one copy of the Notice for the above-referenced application.

Sincerely,

Michael Gregory

cc:

Lori Potter, Esq.

FCSPRNCA1097

AFFIDAVIT OF POSTING NOTICE

IN THE MATTER OF APPLICATION
No. 33-90103 BEFORE THE STATE
DEPARTMENT OF WATER RESOURCES

STATE OF ARIZONA
County of COCHISE } ss.

MICHAEL GREGORY, being first duly sworn, deposes and says that two copies of the notice of Application No. 33-90103 before the Director of the Department of Water Resources for Permit to Appropriate Public Water of the State of Arizona, a true copy of which is hereto attached, were posted either by himself or in his presence on the 15 day of OCTOBER, 19 85.

That one of said notices was posted (Describe how and where posted as accurately as possible)
on bulletin board inside US post office at St. David, Arizona

and the other of said notices was posted (Describe how and where posted as accurately as possible)
on bulletin board inside US post office at Palominas, Arizona

That each of said notices thus posted occupied a conspicuous place in the locality to be affected by the proposed appropriation of water, and remained so posted for thirty (30) consecutive days ending day of 18 November, 19 85.

Michael Gregory

Subscribed and sworn before me this 25th day of November, 19 85.

Laura J. Chavez
Notary Public

OFFICIAL SEAL
LAURA J. CHAVEZ
Notary Public — State of AZ
COCHISE COUNTY
My Comm. Expires May 27, 1989

My commission expires

71-74

FCSPRNCA1098

LAW OFFICES OF

MOLLOY, JONES, DONAHUE,
TRACHTA, CHILDERS
& MALLAMO, P. C.

ARIZONA BANK PLAZA
33 NORTH STONE AVENUE, SUITE 2200
P. O. BOX 2268
TUCSON, ARIZONA 85702
(602) 622-3531

JOHN F. MOLLOY
STANLEY W. TRACHTA
HERBERT MALLAMO
RICHARD T. COOLIDGE
ROBERT E. KAUL
LEO N. SMITH
PAUL D. SLOSSER
ROY W. KYLE
GARY F. HOWARD
DONALD J. OPPENHEIM
SUSAN G. BOSWELL
D. MICHAEL MANDIG
JEANNETTE K. GEISER
TERRY L. TEDESCO
MARY O. AMELN
ARDNER R. CHESHIRE, JR.

RUSSELL E. JONES
JOHN L. DONAHUE, JR.
DONALD S. ROBINSON
MYLES C. STEWART
PETER JOHNSON
MICHAEL J. MEEHAN
PETER VOEVODSKY
SARAH R. SIMMONS
FRED LUYTIES
LARRY D. CLARK
THOMAS W. ROUSE
EARL F. DANIELS, III
MARK S. SIFFERMAN
DAVID A. McEVOY
WILBUR M. ROADHOUSE
KENNETH R. MOELLER

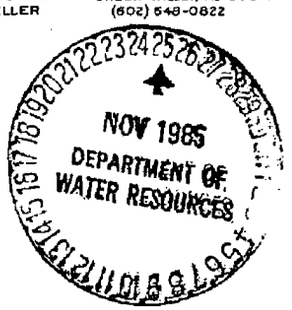
THOMAS H. CHILDERS
VICTOR H. VERITY
OF COUNSEL

DON BENNETT MOON
COUNSEL

PHOENIX OFFICE
4041 NORTH CENTRAL
SUITE 2001
PHOENIX, AZ 85012
(602) 263-7784

GREEN VALLEY OFFICE
1151 SOUTH LA CANADA DRIVE
SUITE 210
GREEN VALLEY, AZ 85614
(602) 648-0822

November 22, 1985



Arizona Department of Water Resources
99 East Virginia, Suite 100
Phoenix, Arizona 85004

Gentlemen:

Enclosed please find a Protest of Tenneco West, Inc. to the Application to Appropriate Water filed by the Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife issued October 8, 1985.

We request that you serve copies of this Protest upon the applicants. In addition, we would like to receive a copy of the Application.

Thank you for your assistance in this matter.

Yours very truly,

MOLLOY, JONES, DONAHUE, TRACHTA,
CHILDERS & MALLAMO, P.C.

John F. Molloy

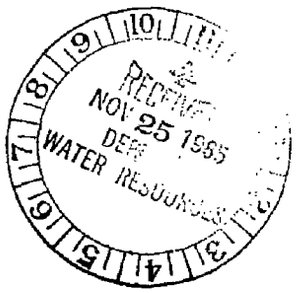
JFM:ckk

Enclosure

cc Mr. David B. Stanton
Tenneco West, Inc.

FCSPRNCA1099

MOLLOY, JONES, DONAHUE, TRACHTA, CHILDERS & MALLAMO, P.C.
ATTORNEYS AT LAW
ARIZONA BANK PLAZA - P.O. BOX 2268
TUCSON, ARIZONA 85702
(602) 622-3531



ARIZONA DEPARTMENT OF WATER RESOURCES

BEFORE THE DIRECTOR

IN THE MATTER OF APPLICATION TO APPROPRIATE PUBLIC WATERS OF THE STATE OF ARIZONA NO. 33-90103 APPLICANTS: Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife SOURCE: San Pedro River PROTESTANTS: Tenneco West, Inc., Tenneco Realty and Development Company and Pueblo del Sol Water Company	PROTEST

COME NOW Tenneco West, Inc., Tenneco Realty and Development Company and Pueblo del Sol Water Company and protest the granting of the Application to Appropriate Water of Huachuca Audubon Society, Chiracahua Sierra Club and Defenders of Wildlife filed with the Department of Water Resources on August 12, 1985. All of the Protestants are owners of land, together with appurtenant water rights.

The grounds for the objection is that there are no unappropriated waters of the San Pedro River available for new appropriation and the purposes for which this diversion is sought is not a beneficial use under the laws of the State of Arizona.

. . .

FCSPRNCA1100

MOLLOY, JONES, DONAHUE, TRACHTA, CHILDERS & MALLAMO, P.C.
ATTORNEYS AT LAW
ARIZONA BANK PLAZA - P.O. BOX 2268
TUCSON, ARIZONA 85702
(602) 622-3531

DATED this 22nd day of November, 1985.

TENNECO WEST, INC.

By _____
John F. Molloy, Esq.
P. O. Box 2268
Tucson, Arizona 85702
(602) 622-3531

TENNECO REALTY AND DEVELOPMENT COMPANY

By _____
John F. Molloy, Esq.
P. O. Box 2268
Tucson, Arizona 85702
(602) 622-3531

PUEBLO DEL SOL WATER COMPANY

By _____
John F. Molloy, Esq.
P. O. Box 2268
Tucson, Arizona 85702
(602) 622-3531

FCSPRNCA1101

Re: Application No. 33-90103

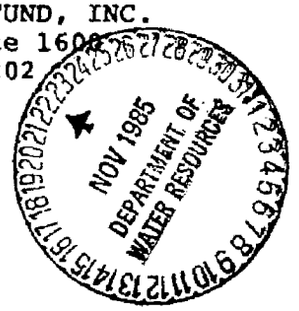
NOTICE OF CHANGE OF ADDRESS & PHONE

Effective November 19, 1985,

Our New Address Will Be:

Lori Potter
SIERRA CLUB LEGAL DEFENSE FUND, INC.
1600 Broadway Street, Suite 1600
Denver, Colorado 80202

(303) 863-9898



FCSPRNCA1102

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

November 21, 1985

Lori Potter, Esq.
Huachuca Audubon Society
Chiracahua Sierra Club and
Defenders of Wildlife
Sierra Club Legal Defense
820 16th Street, Suite 514
Denver, Colorado 80202

RE: Application to Appropriate No. 33-90103

Dear Ms. Potter:

Enclosed is a copy of a letter submitted by Michael D. Goyer, City Manager of the City of Sierra Vista.

You may file a written response within thirty days from the date of this letter. Please send Mr. Goyer a copy of your response and file the original and one copy of your response with the Department of Water Resources.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

cc: Michael D. Goyer

FCSPRNCA1103

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 filed Application No. 33-90103 with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within. The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 16 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona

October 8, 19 85

Arizona Department of
Water Resources

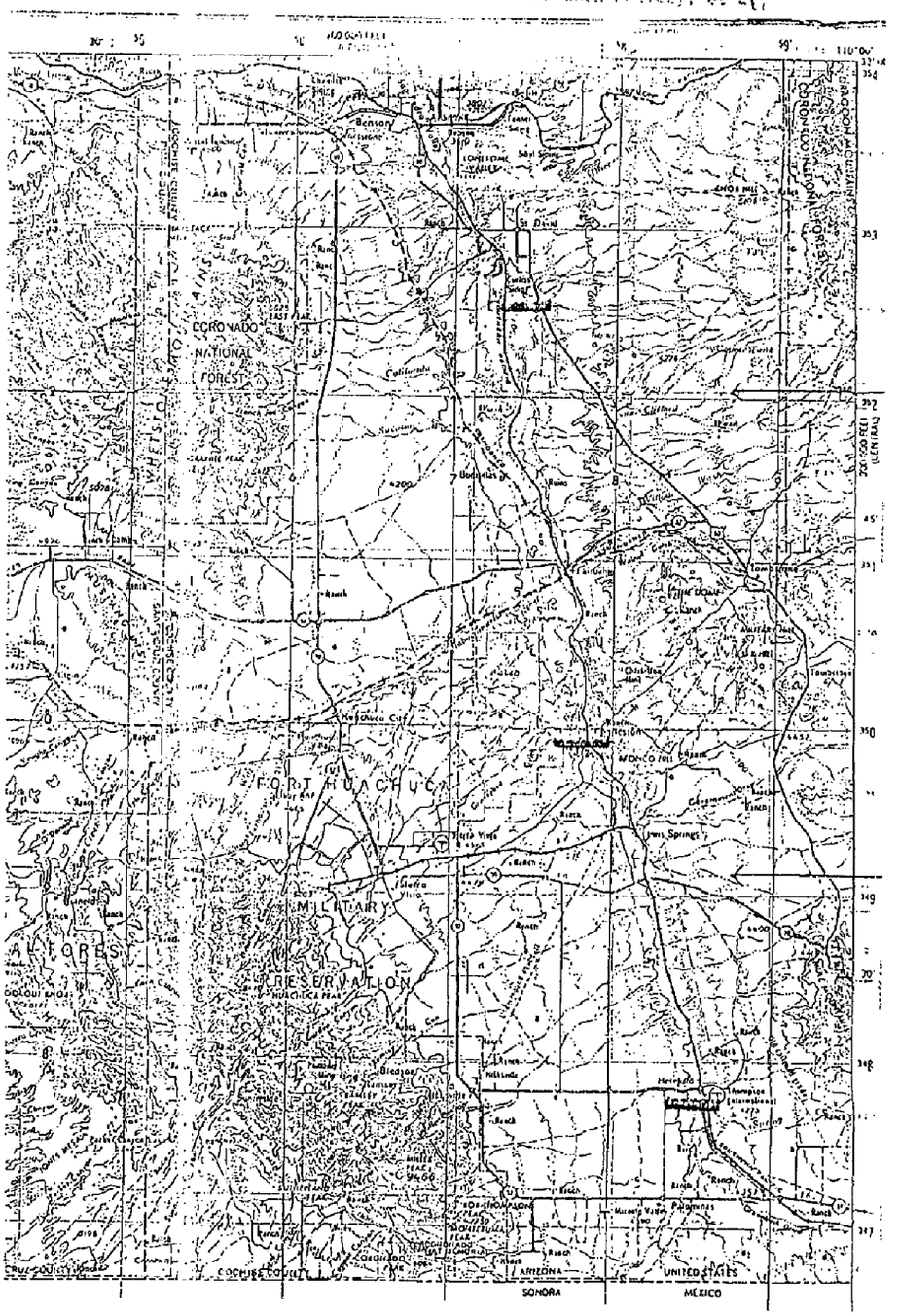
Date of Posting October 15, 1985

kp

21-73

FCSPRNCA1104

NH 12



FCSPRNCA1105

City of Sierra Vista

2400 E. TACOMA STREET
SIERRA VISTA, AZ 85635
(602) 458-3315

NOV 1985
DEPARTMENT OF
WATER RESOURCES

November 14, 1985

Arizona Department of Water Resources
99 West Virginia
Suite 100
Phoenix, Arizona 85004

Gentlemen:

Reference: Application No. 33-90103 for Instream Use of Water of the San Pedro River

We received a copy of the referenced application of the Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife (Sierra Club Legal Defense Fund) dated August 12, 1985, for recreation and wildlife, including fish (wildlife habitat protection) in the natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 19 South, Range 21 East, Gila and Salt River Base and Meridian.

We have on file Application Nos. 33-89137, 33-89138, 33-89139 to appropriate surface water tributary to the San Pedro River, and have filed an application to appropriate ground water of the upper San Pedro River Basin. It does not appear to us that the reference application, whether surface or ground water, would affect or conflict with our filings. If the Department of Water Resources concurs in our presumption, we do not protest. However, if our presumption is incorrect, either from a physical or legal aspect, we do protest and would formally file as requested.

Please clarify the nature of the application and advise us on the matter.

Sincerely,

MICHAEL D. GOYER
City Manager

MDG:GPM/pas

FCSPRNCA1106

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiricahua Sierra Club, and Defenders of Wildlife, filed (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 Application No. 33-90103 with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 11 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona

October 6, 19 85

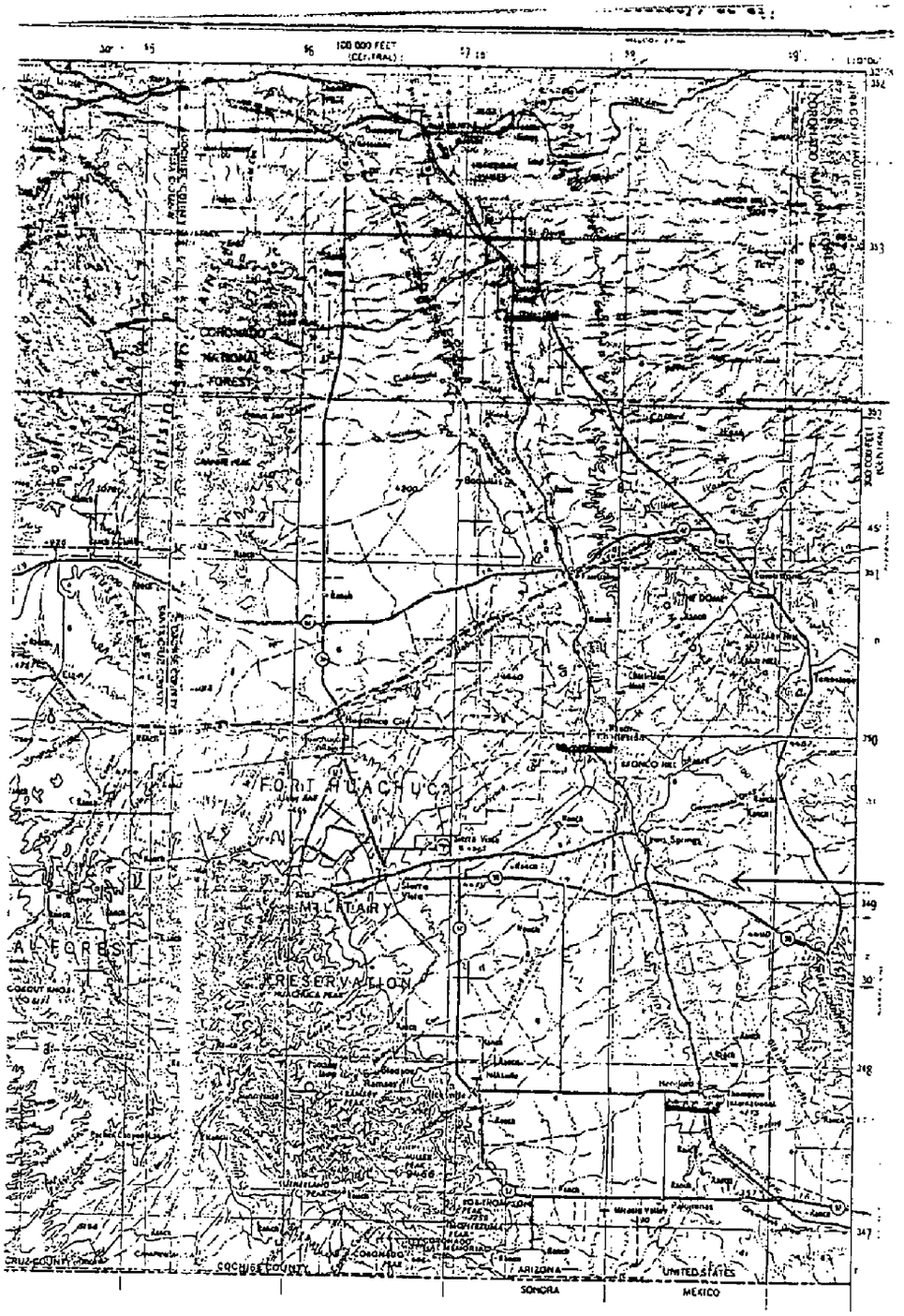
Arizona Department of
Water Resources

Date of Posting _____

kp

21-72

FCSPRNCA1107



FCSPRNCA1108

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
KATHLEEN FERRIS, Director

November 14, 1985

Lori Potter, Esq.
Huachuca Audubon Society
Chiracahua Sierra Club and
Defenders of Wildlife
Sierra Club Legal Defense
820 16th Street, Suite 514
Denver, Colorado 80202

RE: Application to Appropriate No. 33-90103

Dear Ms. Potter:

Enclosed is a copy of the protest submitted by Wayne Gustafson on behalf of the St. David Irrigation District.

You may file a written response within thirty days from the date of this letter. Please send Mr. Gustafson a copy of your response and file the original and one copy of your response with the Department of Water Resources.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:bis
Enclosure

cc: Wayne Gustafson

FCSPRNCA1109

1883-1983

St. David Irrigation Dist.

P.O. BOX 463
ST. DAVID, ARIZ 85630

5 November 1983

Arizona Department of
Water Resources
99 East Virginia
Suite 100
Phoenix, Arizona 85004

Re: OBJECTION to
Application No. 33-90103
Sierra Club
Legal Defense Fund

Gentlemen:

(1) During the approximately ten (10) months a year that the San Pedro River runs on the surface, we as Saint David Irrigation District take our irrigation water that free flows to our irrigation system, and at times of low water this includes the entire amount of surface water.

Approximately two (2) months a year we pump sub-surface water for our irrigation.

(2) Our water was first recorded of being used in 1881 and has been used continually since that time.

(3) Since 1881 we have records of using continually 6000 acre feet of water per year. Of this, 500 acre feet per month is used for approximately 10 months while river is flowing, and 500 acre feet is pumped per month when river is not flowing.

(4) 1600 acres of irrigated land on the East side of San Pedro River between El Paso pipeline on the South and continuing North to approximately 1 mile North of Highway 80 as it passes East and West through St. David.

At various times since 1881 our diversion dam has been located from old town of Contention to present location of Dam for diversion two (2) miles South of El Paso pipeline crossing.

(5) Our use of water is confirmed and recorded in the Arizona Water Commission Bulletin #4 Hydrologic Conditions in San Pedro Valley, Arizona 1971.

See attached map.

Respectively,

Wayne Gustafson

Wayne Gustafson
Member
St. David Irrigation District Board

FCSPRNCA1110

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiricahua Sierra Club, and Defenders of Wildlife, (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 filed Application No. 33-90103 with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona

October 8, 19 85

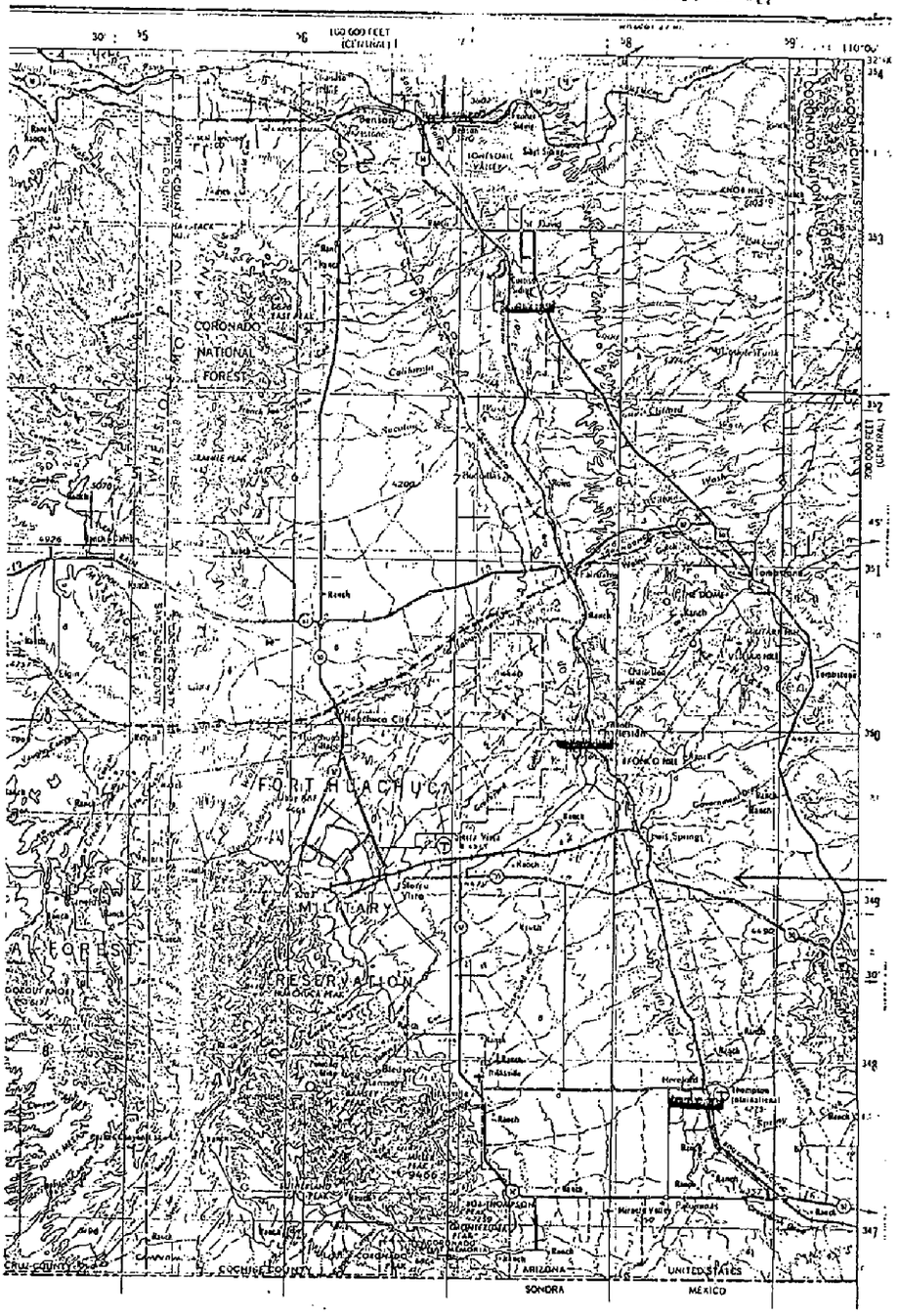
Arizona Department of
Water Resources

Date of Posting

kp

21-73

FCSPRNCA1111



FCSPRNCA1112

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

Date: October 8, 1985

Huachuca Audubon Society, Chiracahua
Sierra Club and Defenders of Wildlife
c/o Lori Potter, Esq.
Sierra Club Legal Defense Fund
820 16th Street, Suite 514
Denver, Colorado 80202

RE: Application to Appropriate No. 33-90103

Dear Ms. Potter:

Enclosed are two copies of the Notice of Posting and an Affidavit of Posting Notice.

The Notices must be posted within twenty days from the date of issuance appearing at the bottom thereof in two conspicuous public places and must remain posted continuously for thirty days. We suggest that one Notice be posted in the post office where those who reside in the locality of the proposed appropriation receive mail. Before posting the Notices, please insert the date of posting at the bottom of each notice.

At the conclusion of the thirty day posting period, the Affidavit of Posting Notice, with one copy of the Notice attached, must be completed, notarized and filed with the Department of Water Resources.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS/kp
Enclosures

FCSPRNCA1113

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

October 8, 1985

Brewery Gulch Gazette
Copper Queen Plaza
P. O. Drawer 48
Bisbee, Arizona 85603

RE: Application for Permit to Appropriate Public Waters
No. 33-90103

Dear Editor:

The Department of Water Resources submits the following material which you may find newsworthy.

Enclosed is a copy of the notice required to be posted by an applicant seeking a permit to appropriate public waters of the State of Arizona.

The area and the permit sought may interest your readers.

Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:kp

Enclosure

FCSPRNCA1115

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

October 8, 1985

The San Pedro Valley News Sun
P. O. Drawer 1000
Benson, Arizona 85602

RE: Application for Permit to Appropriate Public Waters
No. 33-90103

Dear Editor:

The Department of Water Resources submits the following material which you may find newsworthy.

Enclosed is a copy of the notice required to be posted by an applicant seeking a permit to appropriate public waters of the State of Arizona.

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Very truly yours,

George A. Schade, Jr.

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:kp

Enclosure

FCSPRNCA1117

State of Arizona

DEPARTMENT OF WATER RESOURCES

99 E. Virginia Avenue, Phoenix, Arizona 85004

BRUCE BABBITT, Governor
WESLEY E. STEINER, Director

October 3, 1985

Daily Herald Dispatch
102 Fab Avenue
Sierra Vista, Arizona 85635

RE: Application for Permit to Appropriate Public Waters
No. 33-90103

Dear Editor:

The Department of Water Resources submits the following material which you may find newsworthy.

Enclosed is a copy of the notice required to be posted by an applicant seeking a permit to appropriate public waters of the State of Arizona.

The area and the permit sought may interest your readers.

Very truly yours,

George A. Schade, Jr.
Branch Chief
Surface Water/Adjudications

GAS:kp

Enclosure

FCSPRNCA1119

ARIZONA DEPARTMENT OF
WATER RESOURCES
99 East Virginia
Suite 100
Phoenix, Arizona 85004

NOTICE OF APPLICATION TO APPROPRIATE WATER

(Per Rules and Regulations R12-5-502)

Application No. 33-90103

Notice is hereby given that on the 12th day of August, 19 85

Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, (Sierra Club Legal Defense Fund), 820 16th Street, Suite 514, Denver, Colorado 80202 filed Application No. 33-90103, with the Department of Water Resources of Arizona, for Permit to Appropriate Water of the State of Arizona.

DESCRIPTION OF PROJECT

Source of water supply San Pedro River

Proposed use and amount applied for recreation and wildlife, including fish (wildlife habitat protection). The proposed uses contemplate the maintenance of a continuous minimum instream flow.

Point of diversion within The application states that "there will be no diversion; entire appropriation is for use instream".

Place of using water The natural channel of the San Pedro River from the NW¼ NW¼, Section 22, Township 23 South, Range 22 East to the NE¼ NE¼, Section 11, Township 21 South, Range 21 East, and from the NE¼ NE¼, Section 11, Township 21 South, Range 21 East to the NE¼ NW¼, Section 21, Township 18 South, Range 21 East, Gila and Salt River Base and Meridian, Cochise County, Arizona. See map on reverse side of this Notice.

PROTEST

Any person desiring to protest against the granting of such permit shall within 60 days from the date of posting of this notice file with the Department of Water Resources at Phoenix, a signed statement in duplicate clearly setting forth the protestant's objections to the approval of the application, which statement shall contain the following information:

(1) Statement of the injury which would result to protestant from such appropriation and use.

(2) The basis of protestant's water right, and date of initiation of the right.

(3) Protestant's past and present use of water both as to amount used and land irrigated, or use made of water, if other than irrigation.

(4) A description of the protestant's land or place of use, and the point of diversion of the water.

(5) There may also be filed with such statement such maps and data as the protestant may care to submit in support of his protest.

Issued at Phoenix, Arizona

October 8, 19 85

Date of Posting

kp

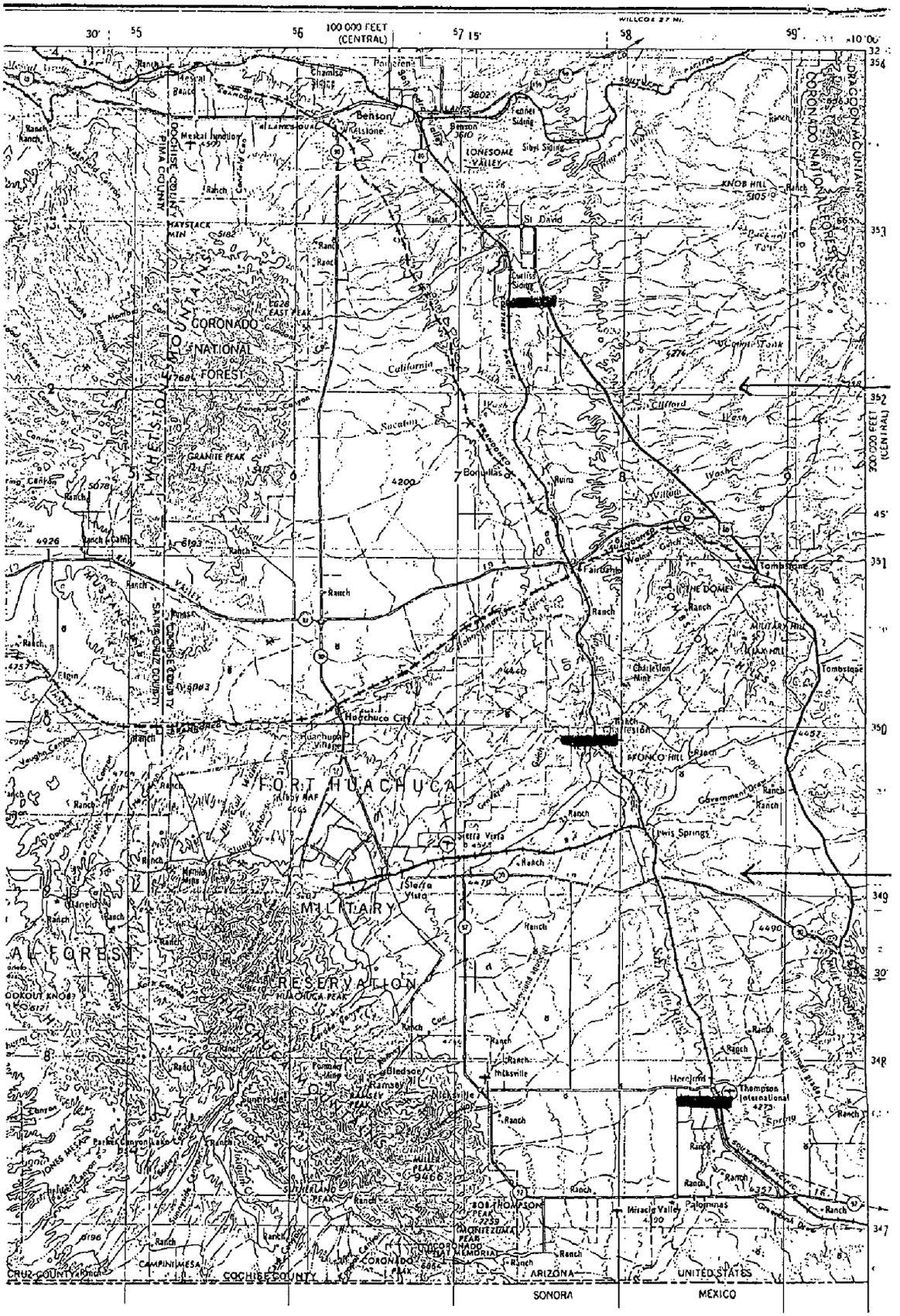
21-73

Arizona Department of
Water Resources

FCSPRNCA1121

Attachment to Application of
Huachuca Audubon Society, et al.

NH 12



FCSPRNCA1122

State of Arizona

DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004

APPLICATION FOR PERMIT TO APPROPRIATE WATER
STATE OF ARIZONA

Application No.	33-90103
Permit No.	
Filed:	8-12-85 (date) at 9:00A. M (time)

Examination Fee $25.00
Map (see Instructions)
APPLICATION MUST BE SUBMITTED IN DUPLICATE

To be filled in by Department of Water Resources

1. Name of Applicant: Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife, c/o their attorney, Lori Potter, Sierra Club Legal Defense Fund, 820 16th St. Suite 514, Denver, CO 80202 (Address, City, State, Zip) (Phone No.) 303-892-6301

2. Indicate by an (x) on the proper line(s) the use(s) for which this application is being submitted: Irrigation ___ Domestic ___ Stockwatering ___ Municipal ___ Power ___ Mining ___ Other Uses X.
(Instream flows for wildlife habitat protection pursuant to A.R.S. 45-141(A))

3. If for irrigation purposes, fill in the following: D.N.A.

Township (N/S)	Range (E/W)	Section	Legal Subdivision	No. of Acres

If for domestic purposes, number of persons _____, or families _____.
If for stockwatering purposes, number and kind of stock watered _____.
If for municipal purposes, name of municipality _____.
If for power purposes, type of plant, size and rated capacity _____.
If for mining, the water will be used in _____ mine.
If for other uses, describe wildlife habitat protection. Members of the Applicant groups visit the river corridor and surrounding lands for wildlife viewing, study, and recreation.

4. For each use applied for (use symbols) state amount of water required for each use: Irrigation - (I), Domestic - (D), Stockwatering - (S), Municipal - (M), Power - (P), Mining - (Mi), Other uses - (O).
See attached page "A"

Symbol				Month/Day
-	cfs/gpm or	ac. ft. from		to
-	cfs/gpm or	ac. ft. from		to
-	cfs/gpm or	ac. ft. from		to

5. The direct source of supply is San Pedro River tributary to Gila River on the San Pedro (leave blank) watershed.
There will be no diversion; entire appropriation is for use instream.

6. The point of diversion (locate on map) is within the ___ ¼ ___ ¼, Section ___, of Township ___ (N/S), Range ___ (E/W), G&SRB&M., in the County of _____.

7. The place of use (locate on map) is in the stream, from Hereford to a point approx. 8 miles south of Benson, ~~xx ¼ xx ¼, Section xx xxxxxxxxxxxxxxxx~~, ~~Range xx, G&SRB&M.~~, in the County of Cochise (N/S) (E/W)
For more detailed description, see attached page "B" and maps

8. Description of the proposed works by which the water is to be put to beneficial use none

9. If water is to be stored, give capacity of reservoir in acre feet D.N.A., height of dam D.N.A. ft., area inundated in acres D.N.A. Use explanatory sheet for capacity for each foot of depth.

10. Construction Schedule. It is proposed to begin construction within D.N.A. (not over 2 years) after approval of this application, to complete construction within D.N.A. (not more than 4 years) thereafter, and to completely apply the water to the proposed use within D.N.A. (not more than 5 years) after the beginning construction.

land owned by the applicant? Yes ___ No X. If "No" explain on page 2.

ter to be used supplementally with other water(s)? Yes ___ No X. If "Yes" identi-
ters or water rights on page 2.

INPUT

SEP 27 1985

FCSPRNCA1123

INSTRUCTIONS:

A map of the standard equal to the maps printed by the United States Geological Survey (Quad Sheets) or State Orthophoto base maps shall be submitted with the application.

EXPLANATORY

Question 11. A.R.S. 45-141(A) provides that "any person may appropriate" water. The term "person" includes a corporation under Arizona water law. A.R.S. 45-180(2), 45-251(2), 45-402(23). Applicants here are non-profit corporations whose corporate purposes include working to protect valuable wildlife habitat. Applicants seek to appropriate unappropriated water for wildlife, which is a beneficial use under A.R.S. 45-141(A). This will be an essentially non-consumptive use, with all water to remain in the stream except for minimal quantities consumed by wildlife. DWR approved a similar permit application by the Nature Conservancy for an instream flow for wildlife purposes in Ramsey Canyon. (Permits No. 33-78419 and 33-78421, 1983).

The undersigned hereby acknowledges that, even though he may have been assisted in the preparation of the above numbered application through the courtesy of employees of the Department of Water Resources all responsibility and risk of loss for the accuracy of the information contained herein, at the time of filing, rests with the applicant.

RECEIVED AUG 12 1985 DEPT. OF WATER RESOURCES

Signature of Applicant

Lori Potter
Attorney for Applicants Huachuca Audubon Society, Chiracahua Sierra Club, and Defenders of Wildlife
Sierra Club Legal Defense Fund
820 16th Street, Suite 514
Denver, Colorado 80202
303-892-6301

PERMIT

Permit No. _____ Application No. _____

STATE OF ARIZONA,)
) ss.
County of Maricopa)

This is to certify that I have examined the foregoing application and do hereby approve the same, and grant to the applicant a permit to appropriate the water and/or to construct the reservoir described therein subject to all prior existing rights as provided by law and to the following limitations and conditions:

The total capacity of the reservoir shall not exceed _____

The amount of water appropriated shall be limited to the amount which can be applied to beneficial use and shall not exceed _____

The priority date under this permit is _____.

Actual construction work shall begin on or before _____ and shall be prosecuted with reasonable diligence and be completed on or before _____. Complete application of the water to the proposed use shall be made on or before _____.

WITNESS my hand and seal of office this _____ day of _____, 19____.

SEAL

_____

for the Director

FCSPRNCA1124

Page "A"/ Attachment to Permit Application of
Huachuca Audubon Society et al.

Question 4 Permit Application

This application requests an appropriation of instream flows of water in one continuous stretch of the San Pedro river. Because flow data is available from two separate gaging stations within this stretch (Charleston and Tombstone), the application is broken down into two discrete segments which make up this stretch of the river: Hereford to Charleston (segment 1) and Charleston to a point 8 miles south of Benson (segment 2).

Segment 1 Amount

Symbol	Month/Day
0	4.19 cfs from 10/1 to 10/31
0	6.30 cfs from 11/1 to 11/30
0	8.65 cfs from 12/1 to 12/31
0	9.5 cfs from 1/1 to 3/31
0	6.15 cfs from 4/1 to 4/30
0	3.89 cfs from 5/1 to 5/31
0	5.73 cfs from 6/1 to 6/30
0	128 cfs from 7/1 to 7/31
0	92.6 cfs from 8/1 to 8/31
0	19.7 cfs from 9/1 to 9/30

FCSPRNCA1125

Segment 2 Amount Symbol	Month/Day
0	.25 cfs from 10/1 to 10/31
0	4.54 cfs from 11/1 to 11/30
0	6.41 cfs from 12/1 to 12/31
0	9.5 cfs from 1/1 to 3/31
0	5.76 cfs from 4/1 to 4/30
0	1.86 cfs from 5/1 to 5/31
0	.26 cfs from 6/1 to 6/30
0	233 cfs from 7/1 to 7/31
0	168 cfs from 8/1 to 8/31
0	40.2 cfs from 9/1 to 9/30

FCSPRNCA1126

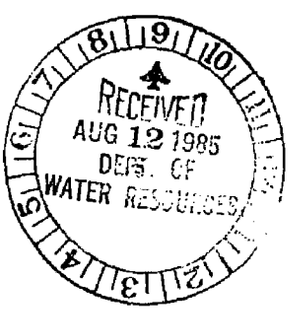
Page "B"/Attachment to Permit Application of

Huachuca Audubon Society et al.

Question 7 Permit Application

Segment one of use will be in the streambed from south of Hereford (NW 1/4 NW 1/4 Sec. 22, T. 23 S., R. 22 E.) to the Charleston gaging station (NE 1/4 NE 1/4 Sec. 11, T. 21 S., R. 21 E.)

Segment two of use will be in the streambed from the Charleston gaging station (NE 1/4 NE 1/4, Sec. 11, T. 21 S., R. 21 E.) to approximately 8 miles south of Benson (NE 1/4 of NW 1/4, Sec. 21, T. 18 S., R. 21 E.)



FCSPRNCA1127

RECEIPT

B.L.M.
SAFFORD DISTRICT
425 EAST 4TH STREET
SAFFORD, ARIZONA 85546

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
OPERATIONS DIVISION
15 SOUTH 15TH AVENUE
PHOENIX, ARIZONA 85007
(602) 542-1581

ENTRY CODE 33

FILE NO: THRU

ITEM DESCRIPTION	RATE	AMOUNT
CERTIFICATION FEE FOR APPLICATION FOR PERMIT TO		25.00
APPROPRIATE PUBLIC WATER NO. 33-90103		
BILL; FEE CREDIT ACCOUNT NUMBER 3 $ 25.00		

CHECK NO. _____ FEE ACCOUNT NO. 3 TOTAL $ 25.00

CHIT NO. _____ RECEIVED BY ROCKO DATE 2/19/92

FS 1321 - Rev. 4/91

FCSPRNCA1128

RECEIPT

Tim Erwin
Arizona State Land Department
1616 W. Adams Street
Phoenix, AZ 85007

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
OPERATIONS DIVISION
15 SOUTH 15TH AVENUE
PHOENIX, ARIZONA 85007
(602) 542-1581

ENTRY CODE 33, 38

FILE NO. THRU

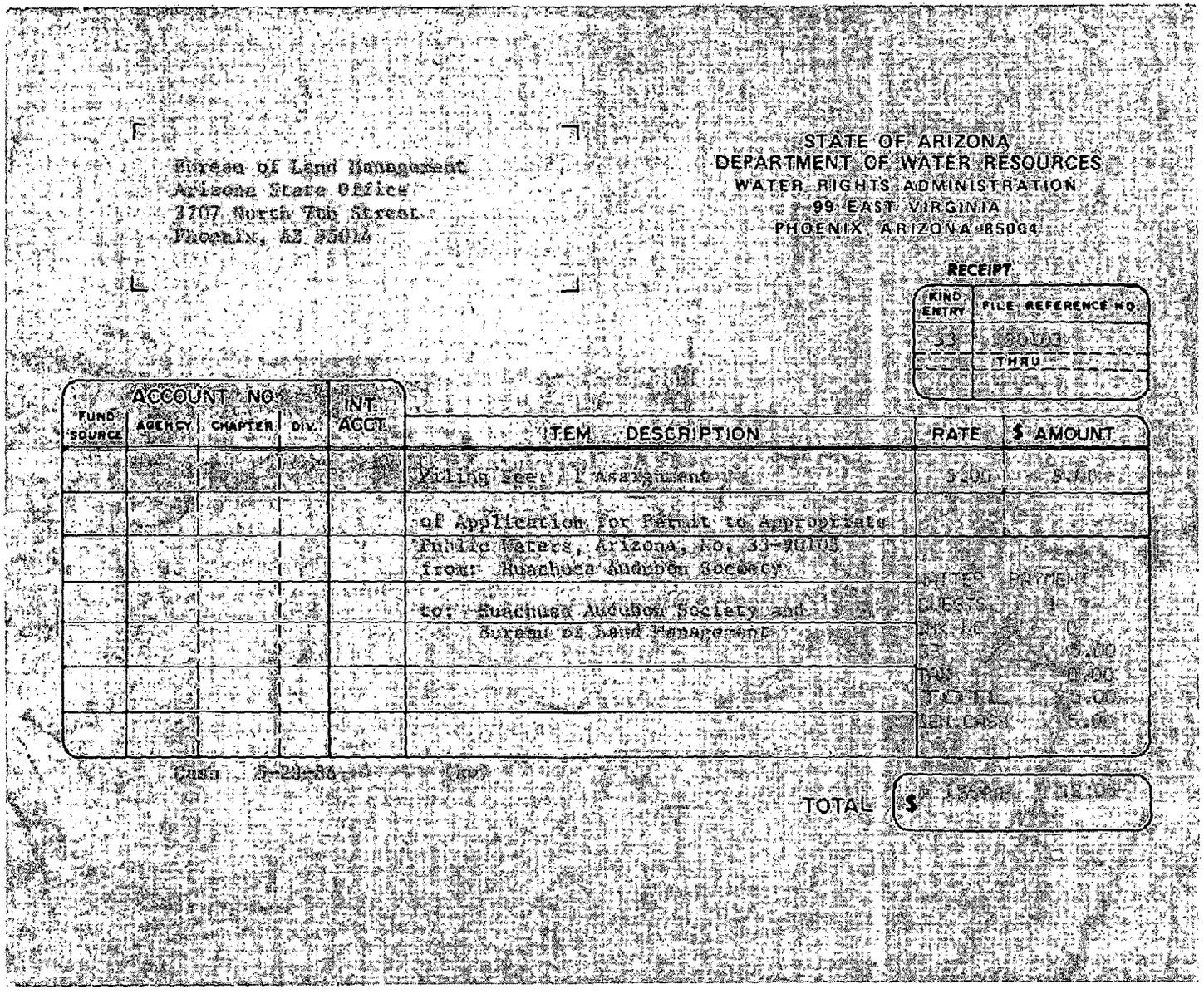
ITEM DESCRIPTION	RATE	AMOUNT
Assignment (Conveyance) of Application to Appropriate Publ c Water Permit Nos. 33-90102.0001 and 33-90105.0001. Claims for	5.00	10.00
Application for Stockpond Nos. 38-19142.0001, 38-19204.0001, 38-19214.0001, 38-19240.0001, 38-19249.0001, 38-19251.0001, 38-19269.0001, 38-22726.0001, 38-22727.0001, 38-22728.0001, 38-22729.0001, 38-22732.0001, 38-22739.0001, 38-22748.0001 38-22750.0001, 38-22849.0001, 38-22911.0001, 38-22924.0001 38-22935.0001, 38-22953.0001, 38-23189.0001, 38-24505.0001, 38-24507.0001, 38-24529.0001, 38-24530.0001, 38-88606.0001, 38-88894.0001, 38-88899.0001, 38-88900.0001, 38-88907.0001, 38-88909.0001, 38-88910.0001, 38-88911.0001, 38-88923.0001 38-88923.0001, 38-89538.0001, and 38-89590.0001.	5.00	180.00
FROM: BLM-Safford District		
TO: AZ State Land Department		
This is Lead File No. 33-90102.0001		

CHECK NO. _____ FEE ACCOUNT NO. 5 TOTAL $ 190.00

CHIT NO. _____ RECEIVED BY JH DATE 8/30/91

WS-1821 - Rev. 4-91

FCSPRNCA1129



Bureau of Land Management
Arizona State Office
3707 North 7th Street
Phoenix, AZ 85014

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
WATER RIGHTS ADMINISTRATION
99 EAST VIRGINIA
PHOENIX, ARIZONA 85004

RECEIPT

KIND ENTRY	FILE REFERENCE NO.
33	90103
	THRU

ACCOUNT NO. FUND SOURCE	AGENCY	CHAPTER	DIV.	INT. ACCT.	ITEM DESCRIPTION	RATE	$ AMOUNT
					Filing fee: 1 Assignment	5.00	5.00
					of Application for Permit to Appropriate		
					Public Waters, Arizona, No. 33-90103		
					from: Huachuca Audubon Society		
					to: Huachuca Audubon Society and		
					Bureau of Land Management		

MATTER	PAYMENT
QUESTS	1
DRK NO	0
33	5.00
TAX	0.00
TOTAL	5.00
GEN CASH	5.00

Cash 5-23-86 (kw)

TOTAL $ [illegible]

FCSPRNCA1130

Huachuca Audubon Society,
Chiracahua Sierra Club
and Defenders of Wildlife
c/o Lori Potter, Esq.
Sierra Club Legal Defense Fund
820 15th Street, Suite 514
Denver, CO 80202

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
WATER RIGHTS ADMINISTRATION
99 EAST VIRGINIA
PHOENIX, ARIZONA 85004

RECEIPT

KIND ENTRY	FILE REFERENCE NO.
83	90103
	THRU

FUND SOURCE	ACCOUNT NO. AGENCY	CHAPTER	DIV.	INT. ACCT.	ITEM DESCRIPTION	RATE	$ AMOUNT
					Examination Fee: 1 Application for Permit to Appropriate Public Waters, Arizona	25.00	$25.00
						WRITER	PAYMENT
						CUSTS	1
						CHK NO	2336
						83	25.00
						TAX	0.00
						TOTAL	25.00
						CHK CHEK	25.00

CL #2336 dated 3-7-85 (9-19-85, kp)

TOTAL $ 25.00

FCSPRNCA1131

SAN PEDRO

CITY OF TUCSON
SAN CARLOS IRRIGATION & DRAINAGE DIST.
SAN CARLOS PROJECT

City of Tombstone 315 E Fremont St Tombstone 85638
Town " Benson 155 Huachuca St Ben 85602
" " Sierra Vista 2400 E Tacoma St 85635
Fort Huachuca USArmy
BLM
SLD
Coronado NF
The Nature Conservancy 785 market St. 3RD Floor San Francisco CA 94103
(33-78419)
Southern Pacific RR 400 E Toole Ave Tucson 85701

↓

FCSPRNCA1132

36 13449 C D Kartchner, Drawer AX, Benson, AZ 85602
14375 P.S. Fenn, Gen. Del. Pomerene, AZ 85627
26565 MJ Kartchner, Rt 1 Box 149 St David AZ 85630
13358 Tenneco West, Inc., Box 9380, Bakersfield, CA 93309
28834 W T meeks, 5635 N Sunray Dr. Tucson 85704
70412 V A Haverty Po Box 512 Benson AZ 85602
12140 R B Higginbotham, Rt 1 Box 24, St. David, AZ 85630
29134 R L Black, 920 W 10th St., SAFFORD 85546
15337 J M Nelson, Box 31, St. David 85630
59365 E. Fenn, RR1, Box II, St. David, 85630
80154 R L Pagna, Box 261, St. David, AZ 85630
81475 F M miller Rt 1 Box 179 St David 85630
17590 W J McRae, Rt 1, Box 68, St. David 85630
36689 C E Baalau, Box 250, St. David 85630
14510 C E Leggett, 8380 E Shiloh Tucson 85710
69278 J McBee 655 N Alvernon #219 Tucson 85711
80376 L H miller, Rt 1 Box 185 St. David 85630
64627 P E McCommas Rt 1 Box 203 St David 85630
46184 St David Irrigation District Box 109 St David 85630
26153 M M Kartchner 3040 Bear Canyon Rd Tucson 85715
21747 G N Whitehead, Rt 1 Box 331 St David 85630
28874 HC Ranch, 1630 N Kilbright Ave Ajo 85321
47753 E Brockelsby, Box 620, Rapid City SD 57701
28596 W E Glenn, Box 998, Douglas, AZ 85607
10362 C J Wolff, 404 Allen St., Tombstone, AZ 85638
75652 H A Plainer, 7475 Hillside Ave, Los Angeles, CA 90046
19426 Tenneco (address above)
43059 W P Ulrich, RR1, Box 146, Hereford, AZ 85615
80089 S L Claridge, Rt 1 Box 300 Safford, AZ 85546
42083 T R Smith, Box 34, Hereford, AZ 85615

33 71847 O L Buchanan, Box 141, Benson, AZ 85602
42733 Tenneco (above)
(A) 4012 Kern County Land Co, Box 380, Bakersfield, CA 85603
(A) 4020 "
11666 Hope I Jones Estate, Po Box 13123, TUCSON 85732
85125 D I Rydalm, Box 183 Tumacacori AZ 85640
89569 Tenneco
83139 J R Bond, Po Box 1, Highway 92, Hereford, AZ 85615
31987 San Rafael Nursery, 400 Truxton Ave, #202, Bakersfield CA 93301

38 13364 Tenneco
29187 Alexander, Rt 1 Box 90, St. David, AZ 85630
80787 F W Merrill Po Box 291, St David AZ 85630
(over)

FCSPRNCA1133

38 69280 F. McRee Po Box 311 Tucson 85702

21750 B & N Whitehead Box 113 St David 85630

11665 Kellam + Kellam, Star Rt Box 65, Elgin, 85611

27754 ~~[illegible]~~ BLM

12173 M W Powell, Box 1875 Bisbee AZ 85603

64283 J A Clinton, Po Box 63, Hereford AZ 85615

10808 San Rafael Ranch (above)

63803 Clinton (above)

FCSPRNCA1134

City of Tucson
Attn: City Attorney
P. O. Box 27210
Tucson, AZ 85726

San Carlos Irrigation District
Morris M. Soma, Dist. Manager
P. O. Box 218
Coolidge, AZ 85228

San Carlos Irrigation Project
Bureau of Indian Affairs
Ralph Esquerra, Project Eng.
P. O. Box 250
Coolidge, AZ 85228

City of Tombstone
Attn: City Attorney
315 E. Fremont St.
Tombstone, AZ 85638

Town of Benson
Attn: Town Manager
115 S. Huachuca Street
Benson, AZ 85602

City of Sierra Vista
Attn: City Attorney
2400 E. Tacoma Street
Sierra Vista, AZ 85635

U. S. Army
Attn: Commanding Officer
Fort Huachuca, AZ

BLM, Safford District Office
425 E. 4th Street
Safford, AZ 85546

State Land Department
Attn: Hydrology
1624 W. Adams St.
Phoenix, AZ 85007

Coronado National Forest
300 West Congress
Tucson, AZ 85701

The Nature Conservancy
785 Market St., 3rd Floor
San Francisco, CA 94103

Southern Pacific Railroad
400 East Toole Avenue
Tucson, AZ 85701

C. D. Kartchner
Drawer AX
Benson, AZ 85602

M. J. Kartchner
Rt. 1, Box 149
St. David, AZ 85630

Tenneco West, Inc.
Box 9380
Bakersfield, CA 93309

W. T. Meeks
5635 N. Sunray Drive
Tucson, AZ 85704

V. R. Haverty
P. O. Box 512
Benson, AZ 85602

R. B. Higginbotham
Rt. 1, Box 24
St. David, AZ 85630

R. L. Black
920 West 10th Street
Safford, AZ 85546

J. M. Nelson
Box 31
St. David, AZ 85630

E. Fenn
R. R. 1, Box II
St. David, AZ 85630

R. L. Payne
Box 261
St. David, AZ 85630

F. M. Miller
Rt. 1, Box 179
St. David, AZ 85630

W. S. McRae
Rt. 1, Box 68
St. David, AZ 85630

C. E. Beeler
Box 250
St. David, AZ 85630

C. E. Leggett
8380 East Shiloh
Tucson, AZ 85710

F. McGee
655 N. Alvernon, #219
Tucson, AZ 85711

L. H. Miller
Rt. 1, Box 185
St. David, AZ 85630

P. E. McCommas
Rt. 1, Box 203
St. David, AZ 85630

St. David Irrigation District
Box 109
St. David, AZ 85630

M. M. Kartchner
3040 Bear Canyon Rd.
Tucson, AZ 85715

G. N. Whitehead
Rt. 1, Box 331
St. David, AZ 85630

H. C. Ranch
1530 N. Kilbright Ave.
Ajo, AZ 85321

FCSPRNCA1135

E. Brockelsby
Box 620
Rapid City, SD 57701

J. R. Bond
P. O. Box 1
Highway 92
Hereford, AZ 85615

W. E. Glenn
Box 995
Douglas, AZ 85607

San Rafael Nursery
400 Truxton Ave., #202
Bakersfield, CA 93301

C. J. Wolff
404 Allen Street
Tombstone, AZ 85638

Alexander
Rt. 1, Box 90
St. David, AZ 85630

H. A. Plainer
7475 Hillside Avenue
Los Angeles, CA 90046

F. W. Merrill
P. O. Box 291
St. David, AZ 85630

W. P. Ullrich
R. R. 1, Box 146
Hereford, AZ 85615

F. McGee
P. O. Box 311
Tucson, AZ 85702

S. L. Claridge
Rt. 1, Box 300
Safford, AZ 85546

G. N. Whitehead
Box 113
St. David, AZ 85630

T. R. Smith
Box 34
Hereford, AZ 85615

Kellar and Kellar
Star Route Box 15
Elgin, AZ 85611

D. L. Buchanan
Box 141
Benson, AZ 85602

M. W. Power
Box 1875
Bisbee, AZ 85603

Kern County Land Co.
Box 380
Bakersfield, CA

J. A. Clinton
P. O. Box 63
Hereford, AZ 85615

Hope I. Jones Estate
P. O. Box 13128
Tucson, AZ 85732

D. I. Rysdam
Box 183
Tumacacori, AZ 85640

FCSPRNCA1136

SURFACE WATER RIGHTS - (Louise)

	NAME	REG #	STATUS	FILE	PRIORITY	LEGAL	DIV	MAP
1	BLM SAFFORD DIST	33-90103.1	ACTIVE - INSTREAM FLOW	Aug 12, 1985	Aug 12, 1985	NW NW 22 23S 22E	POU	4095
2						SW SW 15 23S 22E	POU	4095
3						SE SW 15 23S 22E	POU	4095
4						NW SW 15 23S 22E	POU	4095
5						SW NW 15 23S 22E	POU	4095
6						NW NW 15 23S 22E	POU	4095
7						SE NE 16 23S 22E	POU	4095
8						NE NE 16 23S 22E	POU	4095
9						SE SE 9 23S 22E	POU	4095
10						NE SE 9 23S 22E	POU	4095
11						SE NE 9 23S 22E	POU	4095
12						NE NE 9 23S 22E	POU	4095
13						NW NE 9 23S 22E	POU	4095
14						NW NW 3 23S 22E	POU	4095
15						SE SE 33 22S 22E	POU	4095
16						NE SE 33 22S 22E	POU	4095
17						NW SE 33 22S 22E	POU	4095
18						NE SW 33 22S 22E	POU	4095
19						SE NW 33 22S 22E	POU	4095
20						NE NW 33 22S 22E	POU	4095
21						SE SW 28 22S 22E	POU	4095
22						SW SW 28 22S 22E	POU	4095
23						NW SW 28 22S 22E	POU	4095
24						SW NW 28 22S 22E	POU	4095
25						SE NE 29 22S 22E	POU	4095
26						NE NE 29 22S 22E	POU	4095
27						SW SE 20 22S 22E	POU	3995
28						NW SE 20 22S 22E	POU	3994
29						NE SE 20 22S 22E	POU	3994
30						SE NE 20 22S 22E	POU	3994
31						SW NE 20 22S 22E	POU	3994
32						NW NE 20 22S 22E	POU	3994
33						SE SE 17 22S 22E	POU	3994
34						SW SE 17 22S 22E	POU	3994
35						NW SE 17 22S 22E	POU	3994
36						SW NE 17 22S 22E	POU	3994
37						NW NE 17 22S 22E	POU	3994
38						SW SE 8 22S 22E	POU	3994
39						NW SE 8 22S 22E	POU	3994
40						SE NW 8 22S 22E	POU	3994

4095 ✓
3995 ✓
3994 ✓
3993
3992

4095

11/19/98

FCSPRNCA1137

FCSPRNCA1138

SURFACE WATER RIGHTS - (Louise)

	NAME	REG #	STATUS	FILE	PRIORITY	LEGAL	DIV	MAP
41						NE NW 8 22S 22E	POU	3994
42						SE SW 5 22S 22E	POU	3994
43						NE SW 5 22S 22E	POU	3994
44						NW SW 5 22S 22E	POU	3994
45						SW NW 5 22S 22E	POU	3994
46						NW NW 5 22S 22E	POU	3994
47						NE NE 6 22S 22E	POU	3994
48						SE SE 31 21S 22E	POU	3994
49						NE SE 31 21S 22E	POU	3994
50						SE NE 31 21S 22E	POU	3994
51						NE NE 31 21S 22E	POU	3994
52						SE SE 30 21S 22E	POU	3994
53						NE SE 30 21S 22E	POU	3994
54						SE NE 30 21S 22E	POU	3994
55						SW NE 30 21S 22E	POU	3994
56						NW NE 30 21S 22E	POU	3994
57						SW SE 19 21S 22E	POU	3994
58						NW SE 19 21S 22E	POU	3994
59						NE SW 19 21S 22E	POU	3994
60						SE NW 19 21S 22E	POU	3994
61						SW NE 19 21S 22E	POU	3994
62						NE NW 19 21S 22E	POU	3994
63						SE SW 18 21S 22E	POU	3994
64						SW SW 18 21S 22E	POU	3994
65						NW SW 18 21S 22E	POU	3994
66						SW NW 18 21S 22E	POU	3994
67						SE NE 13 21S 21E	POU	3994
68						NE SE 13 21S 21E	POU	3994
69						SW NE 13 21S 21E	POU	3994
70						NW NE 13 21S 21E	POU	3994
71						NE NW 13 21S 21E	POU	3994
72						SE SW 12 21S 21E	POU	3994
73						NE SW 12 21S 21E	POU	3994
74						SW NW 12 21S 21E	POU	3994
75						SE SE 2 21S 21E	POU	3993
76						SW SE 2 21S 21E	POU	3993
77						NW SE 2 21S 21E	POU	3993
78						NE SE 2 21S 21E	POU	3993
79						SE NE 2 21S 21E	POU	3993
80						NE NE 2 21S 21E	POU	3993
81						NW NE 2 21S 21E	POU	3993

FCSPRNCA1139

SURFACE WATER RIGHTS - (Louise)

	NAME	REG #	STATUS	FILE	PRIORITY	LEGAL	DIV	MAP
82						SW SW 35 20S 21E	POU	3993
83						NW SW 35 20S 21E	POU	3993
84						SW NW 35 20S 21E	POU	3993
85						NW NW 35 20S 21E	POU	3993
86						NE NE 34 20S 21E	POU	3993
87						SE SE 27 20S 21E	POU	3993
88						NE SE 27 20S 21E	POU	3993
89						NE NE 27 20S 21E	POU	3993
90						NW SW 26 20S 21E	POU	3993
91						SW NW 26 20S 21E	POU	3993
92						NW NW 26 20S 21E	POU	3993
93						SE SE 22 20S 21E	POU	3993
94						NE SE 22 20S 21E	POU	3993
95						NW SE 22 20S 21E	POU	3993
96						SW NE 22 20S 21E	POU	3993
97						SE NW 22 20S 21E	POU	3993
98						NE NW 22 20S 21E	POU	3993
99						NW NW 22 20S 21E	POU	3993
100						SW SW 15 20S 21E	POU	3993
101						NW SW 15 20S 21E	POU	3993
102						NE SW 15 20S 21E	POU	3993
103						SE SW 15 20S 21E	POU	3993
104						SW SE 15 20S 21E	POU	3993
105						NW SE 15 20S 21E	POU	3993
106						NE SE 15 20S 21E	POU	3993
107						SE NE 15 20S 21E	POU	3993
108						NE NE 15 20S 21E	POU	3993
109						SE SE 10 20S 21E	POU	3993
110						NE SE 10 20S 21E	POU	3993
111						SW NE 10 20S 21E	POU	3993
112						SE NW 10 20S 21E	POU	3993
113						NE NW 10 20S 21E	POU	3993
114						SE SW 3 20S 21E	POU	3993
115						NE SW 3 20S 21E	POU	3993
116						NW SW 3 20S 21E	POU	3993
117						SW NW 3 20S 21E	POU	3993
118						NW NW 3 20S 21E	POU	3993
119						SW SW 34 19S 21E	POU	3993
120						NW SW 34 19S 21E	POU	3993
121						SW NW 34 19S 21E	POU	3993
122						NW NW 34 19S 21E	POU	3993

FCSPRNCA1140

SURFACE WATER RIGHTS - (Louise)

	NAME	REG #	STATUS	FILE	PRIORITY	LEGAL	DIV	MAP
123						SW SW 27 19S 21E	POU	3993
124						SE SE 28 19S 21E	POU	3993
125						NE SE 28 19S 21E	POU	3992
126						SW NE 28 19S 21E	POU	3992
127						NW NE 28 19S 21E	POU	3992
128						SW SE 21 19S 21E	POU	3992
129						NW SE 21 19S 21E	POU	3992
130						NE SE 21 19S 21E	POU	3992
131						SW NE 21 19S 21E	POU	3992
132						SE NW 21 19S 21E	POU	3992
133						NE NW 21 19S 21E	POU	3992
134						SE SW 16 19S 21E	POU	3992
135						NW SW 16 19S 21E	POU	3992
136						SW SW 16 19S 21E	POU	3992
137						SE SE 17 19S 21E	POU	3992
138						NE SE 17 19S 21E	POU	3992
139						SE NE 17 19S 21E	POU	3992
140						SW NE 17 19S 21E	POU	3992
141						NW NE 17 19S 21E	POU	3992
142						NE NW 17 19S 21E	POU	3992
143						SE SW 8 19S 21E	POU	3992
144						SE SE 8 19S 21E	POU	3992
145						NW SE 8 19S 21E	POU	3992
146						NE SE 8 19S 21E	POU	3992
147						SE NE 8 19S 21E	POU	3992
148						NE NE 8 19S 21E	POU	3992
149						NW NW 9 19S 21E	POU	3992
150						SW SW 4 19S 21E	POU	3992
151						SE SW 4 19S 21E	POU	3992
152						NE SW 4 19S 21E	POU	3992
153						NW SW 4 19S 21E	POU	3992
154						SW NW 4 19S 21E	POU	3992
155						SE NE 5 19S 21E	POU	3992
156						NE NE 5 19S 21E	POU	3992
157						SE SE 32 18S 21E	POU	3992
158						NE SE 32 18S 21E	POU	3992
159						SE NE 32 18S 21E	POU	3992
160						NE NE 32 18S 21E	POU	3992
161						SE SE 29 18S 21E	POU	3992
162						NE SE 29 18S 21E	POU	3992
163						SE NE 29 18S 21E	POU	3992

SURFACE WATER RIGHTS - (Louise)

	NAME	REG #	STATUS	FILE	PRIORITY	LEGAL	DIV	MAP
164						SW NW 28 18S 21E	POU	3992
165						NE NW 28 18S 21E	POU	3992
166						NW NW 28 18S 21E	POU	3992
167						SW SW 21 18S 21E	POU	3992
168						SE SW 21 18S 21E	POU	3992
169						NW SW 21 18S 21E	POU	3992
170						SW NW 21 18S 21E	POU	3992
171						SE NW 21 18S 21E	POU	3992
172						NE NW 21 18S 21E	POU	3992
173						NE SE 21 23S 22E	POU	4095
174	Count:	1					173	

FCSPRNCA1141

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ARIZONA STATE OFFICE
3707 N. 7th STREET
PHOENIX, ARIZONA 85014

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

AN EQUAL OPPORTUNITY EMPLOYER

MR JOE B STUART
MANAGER
SUFACE WATER RIGHTS DIVISION
ARIZONA DEPARTMENT OF WATER RESOURCES
15 SOUTH 15TH AVENUE
PHOENIX AZ 85007

RECEIVED
FEB 24 1992
DEPT. OF WATER RESOURCES
MAIL ROOM

44

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Safford District Office
425 E. 4th Street
Safford, Arizona 85546

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

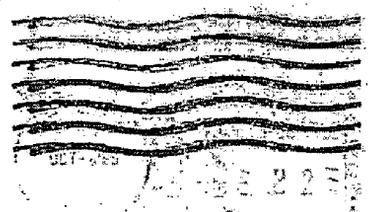
AN EQUAL OPPORTUNITY EMPLOYER

MR. JOE B. STUART
MANAGER, SURFACE WATER RIGHTS SYSTEMS
OPERATIONS DIVISION
ARIZONA DEPARTMENT OF WATER RESOURCES
15 SOUTH 15TH AVENUE
PHOENIX, AZ 85007

RECEIVED
FEB 21 1992
DEPT. OF WATER RESOURCES
MAIL ROOM

FCSPRNCA1142

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004



RETURN TO SENDER
UNABLE TO LOCATE

F. McGee
P. O. Box 311
Tucson, AZ 85702

FCSPRNCA1143

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004

Surface

☐ FORWARDING ORDER EXPIRED
☐ INSUFFICIENT ADDRESS
☐ NO SUCH NUMBER
☒ ATTEMPTED, NOT KNOWN
☐ NO RECEPTACLE
☐ REFUSED
☐ VACANT

1120

File. 33-90103

NOT DELIVERABLE
AS ADDRESSED
UNABLE TO FORWARD
RETURN TO SENDER

TUCSON
OCT 11
P.M.
1985
ARIZ.

OCT 1985
DEPARTMENT OF
WATER RESOURCES

F. McGee
655 N. Alvernon, #219
Tucson, AZ 85711

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004

BAKERSFIELD, CA
PM
14 OCT
1985

UNDELIVERABLE AS ADDRESSED
NO FORWARDING ORDER ON FILE

Bx 380
10/10 wrong address

Kern County Land Co.
Box 380
Bakersfield, CA

33-90103

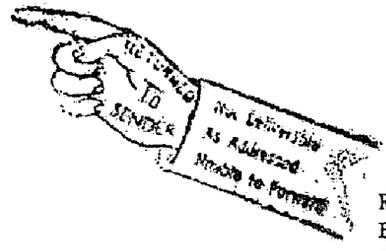
FCSPRNCA1144

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004

D. L. Buchanan
Box 144
Benson, AZ 85602

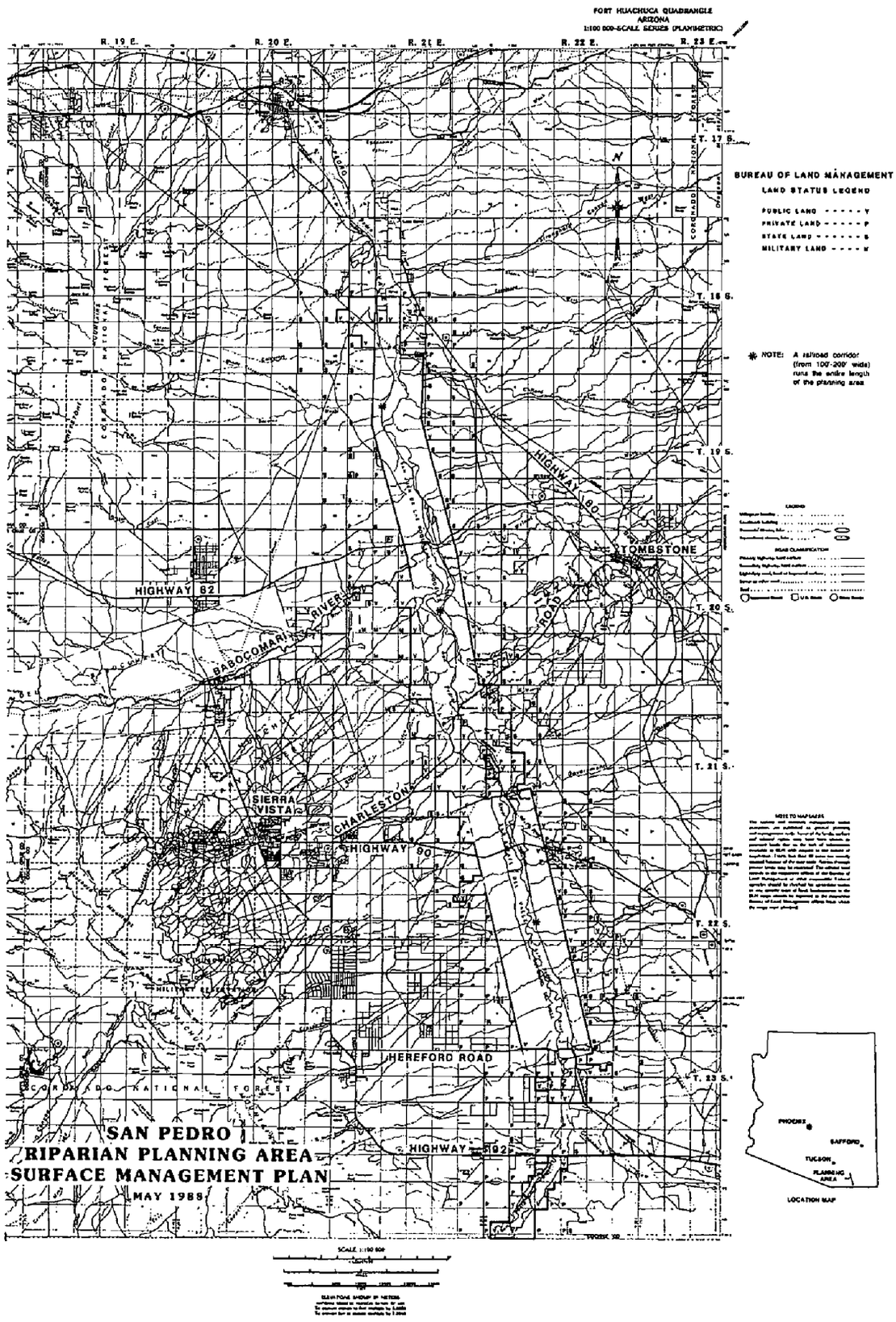
NOT DELIVERABLE
AS ADDRESSED —

State of Arizona
DEPARTMENT OF WATER RESOURCES
99 East Virginia Avenue
Phoenix, Arizona 85004



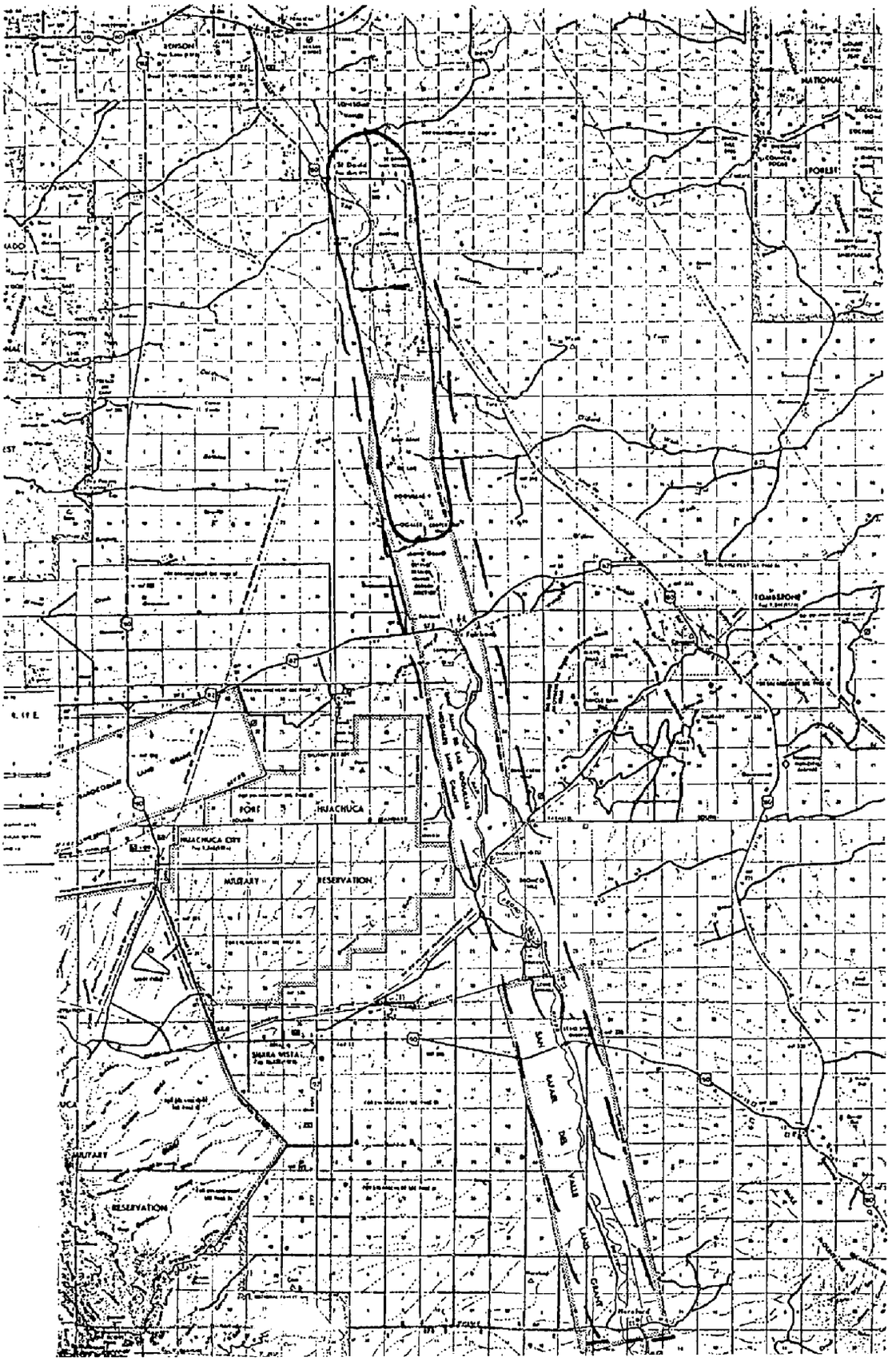
R. L. Payne
Box 261
St. David, AZ 85630

FCSPRNCA1145



FCSPRNCA1146

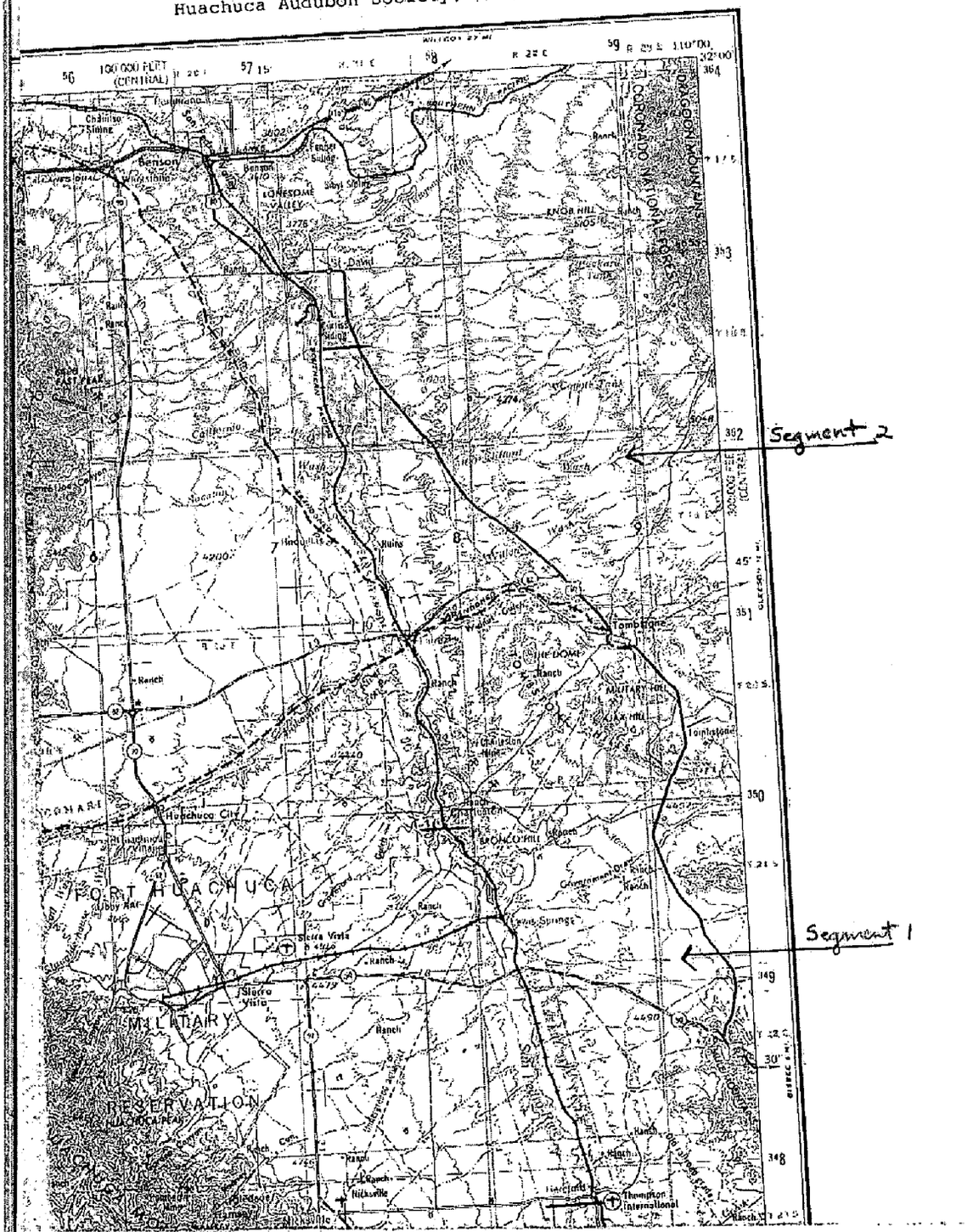
Solid Line: Approximate location of St. David Irrigation system & dam sites.
Dot + Dashed lines are area of application



FCSPRNCA1147

Attachment to Application of
Huachuca Audubon Society, et al.

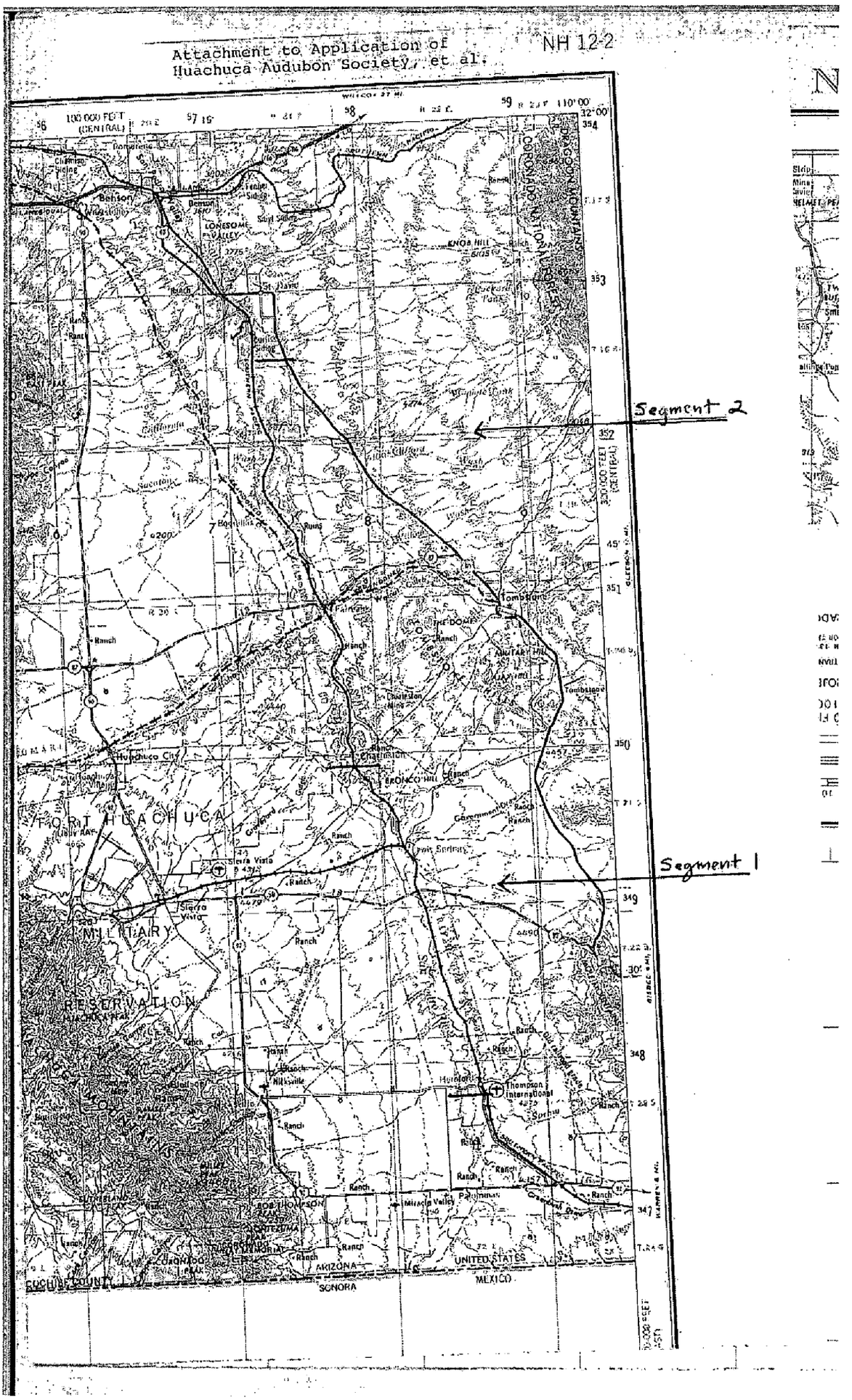
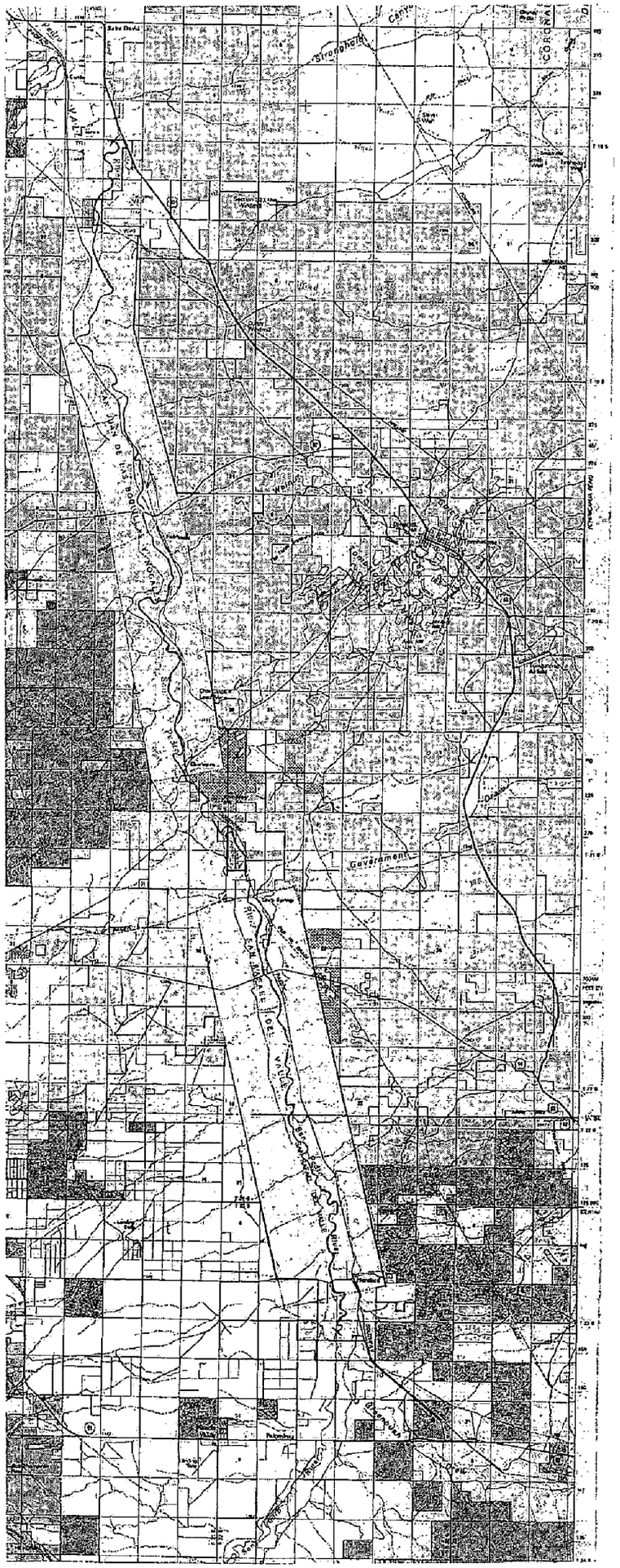
NH 12-2



FCSPRNCA1148

Attachment to Application of
Huachuca Audubon Society, et al.

NH 12-2



FCSPRNCA1149