LAND MANAGEMENT DISTRICT # 1

Mr. Lovald:

There are two types of critical areas: (1) Short of water, and, (2) Overgrazed condition existing because of old permanent supplies of water.

Permanent water is needed in the following sub-unit: Sub-Unit No. 4 - 1 well; No. 1 - 1 well; No. 2 - 2 wells; No. 5 - 1 well; estimated cost, $25,000. Geological investigations are needed. We recommend better grade of cement for windmill.

Mr. D. G. Anderson (Range Management)

There are a few remarks regarding the entire Unit that should be brought out. We will find that in Sub-Unit 5, or the southwest part of the Unit, we have a rather concentration of population. On the rest of the Unit, we have large owners, but a very scattered population. According to Paul Beck, the biggest percentage of large owners are found on this Unit. The number of herds run over 2600 sheep units. We can see why utilization of timber has been light in the northern and western parts of the area. Perhaps this is also true of agricultural development in this area - because of lack of potential farm land and because of population.

Sub-Unit No. 1

Mr. D. G. Anderson (Range Management):

This sub-unit exhibits rough, broken terrain, sparsely inhabited, and is under-utilized because of lack of permanent water.

Mr. H. M. Ivory (Agronomy):

There is practically no farming in this area, only a few small dry farms.

Mr. D. B. Beach (Forestry):

This is the only sub-unit that is deficient in wood. Because of low population, and because there isn't any farming, there is no demand for fence posts or fuel. There is no possibility for reforestration because of low precipitation.

Mr. Reed S. Nielson (Biology):

The rodent population is small. This sub-unit was worked by Mr. Monson, and is not considered critical.

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Mr. Lovald:

It is the opinion of the Group that outside of water development, Sub-Unit No. 1 should not be considered a critical area.

Sub-Unit No. 2

Mr. D. G. Anderson (Range Management):

This can be more or less divided into two divisions - the southern part is well watered, relatively thickly populated, and of a rolling terrain, sandy soil; the northern part is more rocky, little rougher, less thickly populated, and because of lack of permanent water, is under-utilized from a range standpoint.

Mr. Ray H. Kerr (Soils):

The southern portion is mostly sandy soil, and there is severe wind erosion caused by overgrazing. The northern part of the range is in good condition.

Mr. H. M. Ivory (Agronomy):

There is a little more farming in this sub-unit, but it is very scattered, and they are just small farms. I wouldn't call it critical from the standpoint of Agronomy. This is mostly flood area, there being practically no dry farming. There is excessive wind erosion on all the farms. No recommendation is made for treatment. The only thing we could do is carry out cultural practices.

Mr. D. B. Beach (Forestry):

I think this sub-unit is pretty well supplied with wood material. The western part has extensive stands, and there is plenty of wood to supply the post needs. Stands are old and decadent. The most critical condition is the fact that there is practically no reproduction in large parts of the stands. This might be remedied by proper stock utilization. There is very little utilization.

Mr. Reed Nielson (Biology):

The northern part, which consists of high, rocky ground, is primarily infected by ground squirrels, but is not in critical condition. There are kangaroo rats and prairie dogs in the southern portion, and concentrations vary throughout the southern half. Any remedy to lessen the rodent range would have to include the entire southern area. Of course, ground squirrels are found throughout the entire sub-unit.

Mr. Cecil Moyes (Engineering):

No work is recommended on this sub-unit.

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Sub-Unit No. 3

Mr. D. G. Andersen (Range Management):

Sub-Unit No. 3 is rather varied throughout. On the north and eastern side, we have rather broken terrain, and on the southwest corner, it is practically the same. On the central and southern portions, it is rolling, sandy soils, and rock outcrops are prominent throughout the sub-unit. There is a rather thick concentration of people here, but it is more or less seasonal, depending on water and farm land at Cow Springs and Red Lake. The area in around Kaibito, and the eastern portion of the sub-unit is badly overgrazed because of old permanent waters. The area in the southwest portion is moderately overgrazed, but is not in critical condition. This holds true for most of the western part of the sub-unit.

Mr. Ray H. Kerr (Soils):

Erosion conditions in the western half of this sub-unit are not severe. Range soils are good. In the eastern portion, there are good range soils. Agricultural soils in this sub-unit are susceptible to severe wind erosion. The soil is excellent for agricultural purposes.

Mr. H. M. Ivery (Agronomy):

There is a fair amount of farming. It would seem that there is enough to take care of the population. It is not the very best type of farming, as they don't have very much water for it. This is mostly flood irrigated land from short drainages, and I think that some of the larger farms could be improved by putting in combination wire spreader to help check the wind erosion, and also form a dike to spread the water. There is enough farming land to justify doing a little work. Wind erosion is a serious problem on all of the farms, and they need to carry out more farming practices to reduce that erosion.

Mr. D. B. Beach (Forestry):

I would like to emphasize on the overgrazing. Parts of the eastern section of this sub-unit have been accompanied by browsing. The animals have eaten all the green material on the lower half of the trees. It is not widespread, but in local areas. Cutting has been more severe here than on any other part of the Unit. The only way to avoid overcutting is to have supervision of that cutting. The cutting should be supervised, and the material cut should be marked. There is plenty of wood on this sub-unit, particularly in the central part - large cedar trees. Each tree would supply a number of posts. Most of the stands are over-matured, and there are a lot of dead trees. In the extreme eastern part, quite a bit of damage has been done to the pinon reproduction by a leaf-scale.

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Mr. Reed Nielson (Biology):

Outside of woodland areas and open park areas, they have scattered rodent concentrations, particularly prairie dogs. More evenly distributed are ground squirrels and kangaroo rats. As stated for Sub-Unit No. 2, in order to accomplish efficient control, control would have to be worked out over the entire area, in order to gain maximum efficiency and contribute to general rehabilitation of the range. Ground squirrels are common, but not abundant, and range throughout the sub-unit. So far, in Biology, we haven't mentioned anything about the predators. It seems, from observation of this entire district, that coyotes are abundant. In order to accomplish any program of range rehabilitation, coyotes should be controlled throughout the entire Unit. Not many depredations have been reported, but the populations of coyotes contributed to close herding. Coyotes are more abundant here than on any other Unit on the Reservation. One trader reports having 60 or 70 coyote pelts brought in.

Mr. Cecil Moyes (Engineering):

There are a few small erosion control jobs on this sub-unit, but they are so small that they are unimportant.

Project A-1. A suggested irrigation project which will require additional investigation. It is the opinion of the Group that the project is not feasible according to the available information. Further surveys are indicated and requirements of the people should be considered.

We have another critical area. It is a very small area, but I think that from various standpoints, it is rather important. It is at Kaibito. We have an investment in the Day School, etc. At the present time, there are sand dunes moving in from three sides on the Day School. In 1935, the ECW put in a Dipping Vat, and, at that time, there was not an active sand dune between the trading post and the Dipping Vat. At the present time, there is; and because this has been a permanent water supply for a number of years, the entire area has been overstocked. With the moving of the Dipping Vat to the trading post, the situation has been augmented. If we can get this drilled well in sub-unit 4, it will be possible, from range standpoint, to justify moving the Dipping Vat from Kaibito to the well. The Dipping Vat cost about $1,500, and, of course, investment in wells, etc. would be already put in because of needed water development in that area. The area could be fenced around Kaibito, and planting might aid in preventing further wind erosion, stabilize those sand dunes, and prevent the loss of the Day School. We could fence immediately around the dune, but in order to stop that dune, we would have to fence quite a ways around there. The Dipping Vat is in good condition. The only thing that we could salvage is the boiler.

Mr. D. B. Beach (Forestry):

There are plenty of fence posts around there. It would be cheaper to cut new ones rather than dig up the old ones and move them.

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Sub-Unit No. 4

Mr. D. G. Anderson (Range Management):

This sub-unit represents much the same situation as we found in Nos. 1 and 2. It is sparsely settled. In portions, it is over-utilized or approaching proper utilization, whereas the southeast portion is over-utilized with a heavier concentration of population. The terrain is rather varied. On the east and north, we have very rough broken country, Navajo Canyon coming in as the boundary. Through the central portion, there is a small area of broken land. Otherwise, the land is slightly rolling terrain. Sandy soil is exhibited through the area, with rock outcroppings having been noted near the Canyon.

Mr. Ray H. Kerr (Soils):

There is a small valley just east of Kaibito Quad, on which there is excellent agricultural soil if we could get water on it. Any of the soil could be used for agricultural purposes except for water. The range soil is excellent as it has cover on it, and isn't effected by wind erosion. Overgrazing is a serious factor. No recommendations are made for erosion control.

Mr. H. M. Ivory (Agronomy):

We have a few farms on this sub-unit - roughly, 50 to 75 acres. This farming land is more or less concentrated in about the southern portion of the sub-unit. I think that we can do little work on these farms to help to hold the water on them. Perhaps, putting in some spreaders and border on the lower end to keep the water from running off. What farms there are are flood irrigated. No storage sites have been located.

Mr. Cecil Moyes (Engineering):

E.C.-3. There is a rather small gully at present, but this is cutting back through this valley, and it is about 3 to 3½ miles long. This isn't all one gully. We find several heads are starting, and they haven't joined together. Work is recommended along that. Up at the head of that same drainage, we have the same conditions that we have on E.C.-1. They have changed the road four or five times to prevent cutting erosion. If the stock water tank is replaced, it would cut down quite a bit of erosion control cost because a lot of the water would be held up.

Mr. D. G. Anderson (Range Management):

I'm recommending that stock water tank be replaced, and this will cost around $450.

Mr. D. B. Beach (Forestry):

Sub-Unit No. 4 is quite comparable to Sub-Unit 1. The central part is called the 4-9 type. They have trees on them, but the stand is

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very thin. There is enough wood to supply the demand. The extreme northern part does not have much wood. The demand on this sub-unit is small and utilization is very small.

Mr. Reed Nielson (Biology):

Sub-Unit No. 4, so far as rodent control is concerned, is the most critical area in this Unit. It is my opinion that the estimate would be five prairie dogs per acre. Disregarding the woodland areas, and particularly the drainages to the north that drain into the Navajo Wash, this concentration of prairie dogs is fairly even. There are small areas where the dens will run as high as 30 dens per acre. These concentrations are unusual. Control measures are absolutely necessary, and should be put in effect.

Sub-Unit No. 5

Mr. D. G. Anderson (Range Management):

Sub-Unit No. 5 is critical area from every standpoint there is. In first place is wind erosion. Black Mesa exhibits very broken terrain with the exception of a small area in the southern part, which is mesa table land. The population is concentrated around the cultivated area at Cow Springs and Red Lake. The range is over-utilized over the entire area.

Mr. Ray H. Kerr (Soils):

There is plenty of agricultural soil, and the range soils on this sub-unit are fairly eroded, and will have to be controlled. Agricultural soil then can be used, particularly at Cow Springs. Would recommend more detailed study at Red Lake, should there be any proposed extension of farm land, and allow study of soil at Cow Springs for best agricultural soils. Water is the limiting factor.

Mr. B. M. Ivory (Agronomy):

We have an irrigation project at Cow Springs, but there has only been approximately 20 acres developed under this project, and the Engineering Division is proposing a project to enlarge the lake and provide more water. This will make it so we can put in additional agricultural land. There is land that can be developed to the extent of water that is supplied. In this particular place, I think there is a good chance to develop all the farm land that we can, especially due to the fact that it is quite scarce in the whole unit. On the drainages that come down from Black Mountain, some Indians farming in that locality have complained of too much water. They farm under flood irrigation, and large flows wash out the crops. I think we can do some work on these farms to control the water at the head of them, and large flows will be diverted from the land, and on small flows, they can get full benefit from them. At Red Lake, there is quite a large farming area, but it is getting too much water on the lower end where the gully first spreads out. There is a possibility of diverting the water around to the side of that so that they can farm the whole area. I'm not sure whether it will be worthwhile or not. It is classified as a critical area.

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Mr. Cecil Moyes (Engineering):

Cow Springs Irrigation Project is the best project on the whole Unit. It is the only one that has any permanent water and excess amount of land. In 1933, the Irrigation Service put in this lake and subjugated about 50 acres of that land. The first flood after this subjugation on the farm land ruined it. What is proposed is to cut the gully, take it into the lake, store the water, and take the water from the gully, providing additional water in the lake and preventing erosion on the farm land. I believe it is going to be about 150 acres of land for which water will be provided. The project is called A-2.

A-2. Preliminary survey has been completed, and detailed engineering surveys are now in progress. Estimates will be submitted.

Down below, we do have rather flat areas where we can spread the water and desilt it. This water can be taken out around the edge of the farm land by a dike, leaving openings into the dike to allow some of the water to pass into the farm land, and some of it to bypass. There is plenty of farm land in there to justify the cost.

Below Red Lake, Farm No. 1. This farm is sub-irrigated from Red Lake. Most of the water that goes into the Red Lake flows directly across this farm. Part of the crop is washed out whenever this water runs through. It is concentrated along one side of the field. It is proposed to put in about three rock and wire jetties, cause the water to spread more evenly instead of concentrating on one side.

Mr. H. M. Ivory (Agronomy):

It will benefit the people who are trying to farm, because when they do get water, it is flood water. It will not effect the project already planned on Red Lake.

There is an erosion control project south of Quad Line. - EC-1. The soil is rather heavy in there, however, there is a pretty good growth of greasewood. A small gully cuts back from the large gully at the south end. No treatment is suggested for the large gully, but there is on the small one and on the main road that runs up through that gully - the big gully is caused by side drainage that comes in from Black Mountain about two miles above. It is at the south end of the valley. Below that, there is nothing of any value. It'll be a small job, probably costing not over 15¢ or 20¢ per acre. Justification is range land, there being about 5 acres of farm land.

Water spreading area on those small drainages that come down from Black Mountain to the east of Cow Springs.

We [illegible] 5 or 6 small drainages that can be spread on the range land. We are [illegible] recommending that any farms be put in there. This is not to be developed at Government cost. Should the Indians want to [illegible] in there and farm any place where we spread the water, I think that they should be given permission to break not over two acres of land. Justification is from range standpoint altogether.

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There are two or three small erosion control projects located between Red Lake and Black Mesa to the east. They are small heads, possibly 10 feet wide and 3 to 4 feet deep. Put a rock drop in each of those to check the head cutting. Justification is range land. It would effect from 300 to 600 acres. Roughly, the cost would be about 16 2/3¢ per acre.

Mr. D. B. Beach (Forestry):

I haven't done any work on Sub-Unit 5. I understand that there are some pretty good stands in the southern part of Black Mountain, but can't say anything as to the condition or density of this sub-unit.

Mr. D. G. Anderson (Range Management):

In Unit 3, there is a shortage of wood and wood products, and Hopi Indians from Moencopi have been going out and clear cutting the trees in any area, not paying particular attention to where or how many they cut. It is indicated that there should be an area set aside in the southern part of woodland stands of Black Mesa for Hopi Usage from Moencopi. There seems to be no other way we can get around this. In the northern part, there is scattered woodland and grasslands, and in the east, there is some sage woodland type. The central part is treeless. There is plenty of water and there might be some windbreak plantings.

Mr. Reed Nielson (Biology):

Monson worked this area, and I wouldn't want to make any statement.

Mr. D. G. Anderson (Range Management):

In order to obtain better livestock distribution on Black Mesa, I am proposing water developments. The area is moderately over-utilized or approaching proper utilization, and rough terrain makes it necessary for more water development, but it will be of temporary nature. Two or three are necessary to fulfill the requirements of the land. Earth dams will probably cost from $12 to $15 each.

Mr. Cecil Moyes (Engineering):

There is another thing I would like to bring up. Tuba City Rainfall Records show an annual rainfall of 6.9 inches, and the Gauging Station at Lee's Ferry shows approximately 6½ inches average annual rainfall. The one at Kayenta, located east of this Unit shows an average annual rainfall of 8.6 inches. From that, we can see that there is very little chance for dry farming, as the average would be about 7 inches yearly expectancy.

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