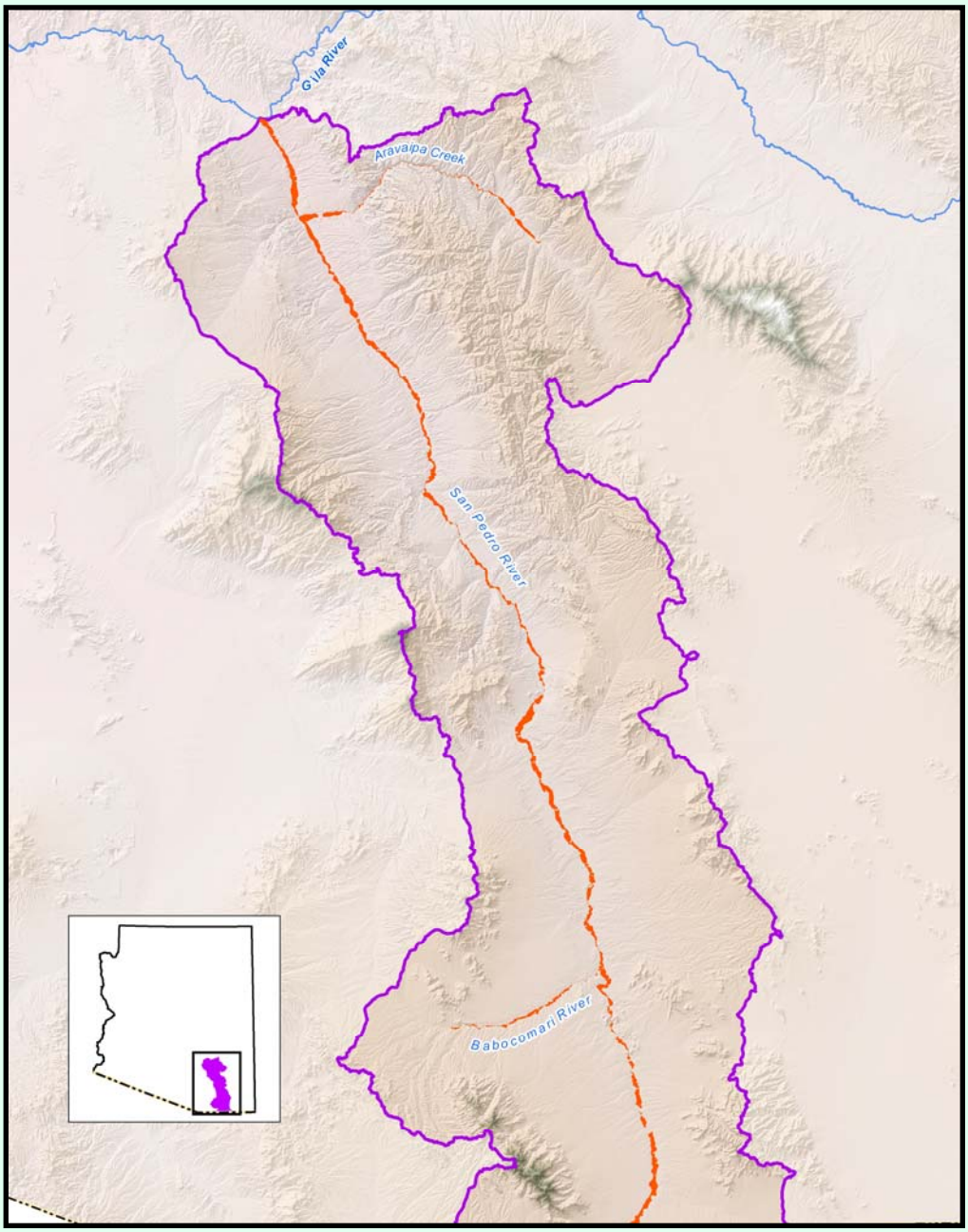
SRP15588

SUBFLOW ZONE DELINEATION REPORT FOR THE SAN PEDRO RIVER WATERSHED

In re The General Adjudication of the

Gila River System and Source



Arizona Department of Water Resources

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Recent Channel Conditions

The current channel and floodplain of the Babocomari River is typically covered with coarse alluvium and entrenched from 3 to 20 feet below terraces formed by abandoned floodplains. Channel alluvium is thin to absent only along bedrock reaches in its headwaters near the Mustang Mountains and along a 1-mile bedrock canyon near its confluence with the San Pedro River where the Holocene floodplain alluvium narrows to less than a 100 feet. The channel is not entrenched for several miles upstream of a dam constructed near the Babocomari Ranch headquarters. The influence of the dam diminishes above the O'Donnell Canyon confluence. Ground photographs of the current channel of the Babocomari River are shown in **Figure 4-3**.

4.1.3 Aravaipa Creek

Geologic History

As with the San Pedro and Babocomari Rivers, Aravaipa Creek crosses deep sedimentary basins bounded by mountains formed during basin and range faulting. Along its lower reach, the creek crosses the sedimentary basin underlying the lower San Pedro River Valley. The geologic history of that basin is summarized in **Section 4.1.1**. Along its upper reach, the creek crosses a second basin bound by the Black Hills and Galiuro Mountains to the west and Pinaleno and Santa Teresa Mountains to the east. These mountains and hills rose from 5 to 13 million years ago and shed sediments into the adjacent basin. Between the basins, the creek has cut a path through the Galiuro Mountains by way of Aravaipa Canyon.

Historic Channel Conditions

When surveyed in 1875, the upper reach of Aravaipa Creek was described as a low energy, relatively unincised stream. By 1914, the area upstream of a historic wagon trail called the Globe to Willcox Road had become entrenched up to six feet. In addition to the potential causes of entrenchment listed in **Section 4.1.1**, use of the wagon trail may have initiated erosion along this portion of the creek.

Since that time, headward and bank erosion have continued upstream and are probably still occurring today. As evidence, modern fences can be found in places suspended over 10 feet above the active channel.

Recent Channel Conditions

The active floodplain of Aravaipa Creek is typically sandy, from 300 feet or more wide, and entrenched from 6 to 15 feet below older Holocene terraces and Tertiary basin-fill deposits. The current channel is largely unvegetated and can shift significantly within the floodplain in response to storm events. Tributaries are relatively steep and choked with coarse sediments that spill onto pre-entrenchment floodplain deposits and, in some areas, reach the current creek channel. This excess sediment suggests that the drainage system of Aravaipa Creek is less mature than the San Pedro River (i.e., sediment transport out of the basin began later than the San Pedro's integration with the Gila River).

In upper Aravaipa Valley, upstream from Black Canyon, the channel of Aravaipa Creek is weakly incised and difficult to follow in places. Construction of earthen and concrete dams and diversion structures across the creek probably contributed to channel aggradation in this area. Downstream of the valley, within Aravaipa Canyon, the creek narrows to a few hundred feet or less and is bound by steep bedrock walls that can reach nearly 1,000 feet high. Here the channel is covered with coarse flood deposits and stabilized by relatively dense riparian vegetation. Ground photographs of the current channel of Aravaipa Creek are shown in **Figure 4-4**.

4.2 MAPPING METHODS

This section explains the methods used to map the extent of Holocene channel, floodplain, and terrace deposits (together referred to as floodplain Holocene alluvium) along the San Pedro River and its two major tributaries, the Babocomari River and Aravaipa Creek. In support of efforts to map subflow zones in the San Pedro River Watershed, ADWR contracted AZGS in March 2007 to map the surface geology