ABSTRACT*

Erosion of Terraces and Archeologic Sites along the Colorado River, Grand Canyon National Park, Arizona

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Numerous archeologic sites and features on terraces and in alluvium of the Colorado River have been damaged or destroyed by erosion since closure of Glen Canyon Dam in 1963. Generally, archeologic remains are damaged by arroyo cutting or gullying in short, ephemeral-tributary streams that drain the terraces of the river corridor. These streams are small; 90 percent have catchment area of less than 20,000-30,000 m^2 (4.9 - 7.4 ac) and channel length of less than 300-400 m (656-1310 ft). Driven by excessive rainfall that results in heavy runoff, arroyo cutting deepens, widens, and expands the channel system and catchment area. The extent of arroyo cutting is related to past and present depositional levels of the Colorado River, which are local baselevels of erosion. The post-dam local baselevel is 3-4 m (10-13 ft) below the lowest pre-dam level; this decrease resulted from elimination of the annual flood and a six-fold reduction of sediment load. Eighty percent of tributary streams end above or on the pre-dam depositional level, but during large runoff the channels are free to extend upslope as well as downslope toward the river. These channels will eventually reach the Colorado River, where the channel gradient will be lowered by 3-4 m. Arroyo cutting will be intensified until channel gradients adjust to the post-dam baselevel.

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