

Hydrology

Importance

Geomorphic conditions or surface features and the relationship of groundwater to geology have shaped the cultural landscape of Sand Creek Massacre National Historic Site. The floodplain, or the low area adjacent to Big Sandy Creek subject to flooding, has been altered by roads, water diversions to canals, and other human-related disturbances. The presence—or absence—of water and the interaction of water with geology affects wetlands, riparian areas, vegetation composition, and wildlife habitat. The hydrology of the Sand Creek Massacre National Historic Site is extremely sensitive to human disturbances and other alterations.



Big Sandy Creek floodplain.

Status and Trends in Sand Creek

Disturbances to the Big Sandy Creek floodplain and vegetation are related to historic settlement, agricultural activities, and drought. The natural surface drainage from several small tributaries and adjacent hills were diverted into the Chivington-Brandon Irrigation Canal, which extends along the eastern edge of the floodplain. After nearly a century of neglect, the canal bottom is severely eroded and carries sediments downstream. Though the Big Sandy Creek watershed drains more than 3,400 square miles of southeastern Colorado to the Arkansas River, it is unlikely to produce extreme or regular flood conditions because of the permeable soils and the slope of the drainage. However, undersized culverts and bridges can exacerbate flood effects by reducing flow and introduce road material into wetland and riparian areas. The establishment of cottonwoods along the creek bed after 1864 may be associated with historic flooding events.



RESOURCE BRIEF



Flooded road in Sand Creek Massacre NHS, 2007.

Discussion

The region is currently under drought conditions and the Big Sandy Creek is presently an intermittent stream. Shifts in vegetation composition since 1864 may be related to drought as well as agricultural disturbances, introduced species, and changes in fire frequency. Areas of intense agricultural disturbance will likely continue to be dominated by species not typical of the area until a more normal rainfall pattern returns. Water quality and impacts of groundwater development were examined in 2005 and 2006 related to the establishment and development of Sand Creek Massacre National Historic Site. Groundwater quality in the area of the creek has generally been rated as fair to poor. Old wells in the site related to ranching activities which likely have poor surface seals and can cause surface water to flow down the outside of the well and contaminate groundwater, will need to be repaired.



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