

STATEMENT OF FINDINGS

STATEMENTS OF FINDINGS FOR
EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT
CHICKASAW NATIONAL RECREATION AREA
GENERAL MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT

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INTRODUCTION

In accordance with Executive Order 11988 — Floodplain Management and National Park Service (NPS) guidelines for implementing the order, the National Park Service has reviewed the flood hazards in Chickasaw National Recreation Area, and has prepared this statement of findings (SOF).

In examining the recreation area, the only structure identified to be within a regulatory floodplain was the Travertine Nature Center. No other structures within a regulatory floodplain require a flood hazard assessment. The Buckhorn and Point campgrounds are subject to flooding due to high water levels in Lake of the Arbuckles. However, flooding of these campgrounds is due to a regulated reservoir, and does not pose a threat to human life or contribute to the degradation of natural floodplain values. Any flooding that does occur is gradual — there would be sufficient time to evacuate and close sites that are flooded. The campgrounds are thus not considered to be subject to the NPS floodplain guidelines.

This statement of findings focuses on evaluating the flood hazards for the Travertine Nature Center in the Travertine Creek floodplain. As a part of the effort to develop a general management plan (GMP) for Chickasaw National Recreation Area, the statement of findings describes the flood hazard, alternatives, and mitigation measures for the continued use of this area. Additional detail regarding Chickasaw National Recreation Area, future actions to be taken in the area, and environmental impacts may be found in the GMP/EIS.

Most of the following text is based on a 2004 trip report on the area prepared by the NPS Water Resources Division (NPS 2004).

Description of the Site

Travertine Creek, a tributary of Rock Creek, originates in the Buffalo and Antelope springs area and runs for approximately 1.5 miles. It drains much of the Platt Historic District in Chickasaw National Recreation Area. The watershed area is approximately 3.5 square miles, but the area above the nature center is only about 0.6 square miles. The streambed profile is very steep along Travertine Creek, and there are several pool areas along the creek. The springs result in a steady flow through most of the year.

Travertine Creek has a long history of human occupation. A number of public use facilities are along the creek: the Travertine Nature Center, two picnic areas (Travertine Island and Little Niagara), and two campgrounds (Central and Cold Springs) near the Travertine Creek floodplain. In addition, the Chickasaw National Recreation Area road closely parallels the creek and there are two low-water crossings of the creek. During storms, this road may be closed due to high water.

The Travertine Nature Center, built in 1969, is an L-shaped building with one wing located directly over Travertine Creek. The entire structure is within the regulatory 100-year floodplain as mapped by Harp et al. (1984).

General Characterization of Floodplain Values, Nature of Flooding, and Associated Floodplain Processes in the Area

Travertine Creek's natural floodplain values have been altered by past human habitation and uses. However, the floodplain includes the recreation area's Environmental Study Area, and it still has many natural values. The floodplain is largely covered by a riparian forest and provides habitat for a variety of wildlife species. The nature center has altered some of these floodplain values, such as the depth and extent of some flows, although the overall effect on the creek's floodplain values is probably not measurable.

Travertine Creek is subject to periodic floods, some of which can be large events, although there are no long-term data on the frequency of flooding. Rock Creek, which Travertine Creek flows into, had 22 major floods between 1924 and 1943, with other major floods in 1953 and 1970 (NPS 1998b). Harp et al. (1984) noted that floods on several occasions had resulted in the loss of life on Travertine Creek. Reportedly, flows in the creek have reached the nature center's foundation at least twice since 1969 with one of those events reaching the window level on the upstream side (NPS 2004).

Based on historical precipitation records, the spring and fall are the wettest times of the year in this area (NPS 1998b). This region of the United States may be subject to heavy summer thunderstorms, which can produce large flows. However, floods can occur at anytime of year due to precipitation from severe thunderstorms. Major floods have occurred in the recreation area in January, May, and October. The most damaging flood recorded at Chickasaw National Recreation Area occurred on October 8, 1970, when the area received 11.61 inches — the highest daily precipitation total ever recorded (NPS 1998b).

JUSTIFICATION FOR USE OF THE FLOODPLAIN

Description of the Preferred Alternative and Why Facilities Would be Retained in the Floodplain

The preferred alternative in the GMP is to retain the Travertine Nature Center in its present location. As noted above, all of the structure is in the 100-year floodplain.

The Travertine Nature Center could be moved out of the floodplain. However, this is a very popular educational/recreational site and is one of Chickasaw National Recreation Area's major visitor use areas. Moving the facility would be extremely costly and is not currently economically feasible. Moving the facility also would result in adverse impacts and the loss of other natural resources in the area. In addition, the area is part of a cultural landscape that is listed on the National Register of Historic Places. Moving the facility would adversely affect this landscape. Thus, no alternative locations were considered in the *General Management Plan* that would move the nature center from the floodplain.

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

In addition to being within the 100-year floodplain, part of the building is located on an arch span across the channel, the abutments of which are below the top of the banks. This encroachment on the floodplain will increase the depth of flooding and result in a greater

frequency of flooding – any flows that approach bank full level will be restricted by the structure and a backwater effect will result in raising the level of the flood (NPS 2004).

Harp et al. (1984) estimated the flows of the 100- and 500-year floods on Travertine Creek to be 1,300 and 1,700 cubic feet per second (cfs), respectively. The modeled depth of the 100-year flood is about six feet without accounting for the backwater effect of channel encroachment. This flow would be sufficient to surround and flood the building. The flow also would likely undermine the building's foundation, which would result in its wholesale loss. Furthermore, the steepness of the channel may produce substantial velocities, and the small size of the watershed will result in a time to peak flow of less than one hour (45 minutes). Consequently, a flood of this magnitude would result in dangerous conditions with little warning and could pose a threat to people in the nature center (NPS 2004). Thus, mitigation measures need to be taken to minimize the risk to human life from flooding.

FLOOD MITIGATION MEASURES

The best mitigation measure would be to move the structure out of the floodplain, but as noted above, this option is not currently feasible. However, if the existing structure reaches its usable lifespan, or if a future flood event results in severe damage, then the facility should be relocated.

Structural mitigation to reduce flood hazard is not feasible. Construction of a "flood overflow" channel was reportedly proposed by the authors of the flood study (NPS 1998b). However, such a channel does not appear to be a viable option. The modeled 100-year flood completely fills the valley bottom, affording no location for a diversion channel short of a cross-basin conveyance. Furthermore, the amount of land disturbance and complexity of design and maintenance would render the proposal prohibitive (NPS 2004).

The only currently viable mitigation measure for the nature center is the implementation of an evacuation plan. A planned evacuation would require vigilance on the part of NPS staff but should be feasible. In the case of a severe flood, the modeled 100-year flood indicates that all of the valley bottom would be inundated to a depth of six feet. This would make the access road impassable. However, the NPS staff should have the opportunity to evacuate any visitors by foot to high ground about two hundred feet south of the building. The NPS staff should be fully aware of the hazard posed by flooding and know the criteria and procedures for evacuating visitors. In particular, the NPS staff should know where the highest and most accessible area is near the nature center. Signs also would be placed in the building informing visitors and staff of the flood risk and suggested actions in the event of flooding (i.e., an evacuation route). In addition, a communication system will be developed with the National Weather Service, which would give advance warning to the NPS staff of approaching major storms. On-site NPS staff will assume an "alert status" during periods of heavy rain and monitor water levels in the creek. If a substantial rise is observed, evacuation information will be provided to visitors and relocation out of the most hazardous areas will begin.

Due to the short response time of the watershed, extensive removal of display items and office records will probably not be possible. Consequently, no irreplaceable records, archaeological artifacts, or museum collections will be kept in the nature center – anything kept in the building should be considered expendable.

One other action that can slightly reduce the risk to life or property is to regularly remove debris that collects on the upstream side of the arch span of the nature center. (If sediments accumulate on the upstream side of the span and were determined to be a problem, then they may also be removed, although a Section 404 permit would be required from the U.S. Army Corps of Engineers before this could occur.) This action will help prevent floods from some flows if the span is blocked or partially obstructed, although it will not prevent damage and risk to life from flood flows that approach bank full level.

SUMMARY

The National Park Service has determined that there is no practicable alternative to maintaining the Travertine Nature Center within the floodplain of Travertine Creek. This determination was based on the decision to continue to use the nature center as a primary visitor use area within the recreation area and the substantial cost of moving the facility out of the floodplain. The primary flood mitigation measure is to develop an evacuation plan for the nature center and keep all NPS staff informed of the plan. Although the nature center is within an area subject to flooding, there would be time to warn staff and visitors using the facility to evacuate the area. If a flood occurs, visitors and NPS staff can evacuate to high ground south of the building. The building's foundation also should be inspected as soon as possible for structural integrity problems.

SOURCES

Harp, J., J. Laguros, S. McClint, and L. West. 1984. "A Comprehensive Flood Study of the Travertine and Rock Creek Areas within the Chickasaw National Recreational Area. Sulphur, Oklahoma." Contract #702930013. Prepared for the National Park Service. The Bureau of Water Resources Research, Oklahoma Research Administration and the University of Oklahoma, Norman, OK.

National Park Service 1998. *Water Resources Management Plan*. Chickasaw National Recreation Area, Oklahoma.

National Park Service 2004. "Report for Travel to Chickasaw National Recreation Area. November 4, 2003." by M. Martin. Unpublished report, on file at NPS Water Resources Division, Fort Collins, CO.