

National Park Service

U.S. Department of the Interior

Grand Teton National Park

Wyoming

Statement of Findings

Moose Headquarters Rehabilitation – Site Work

Recommended:

/s/ Mary Gibson Scott

Acting



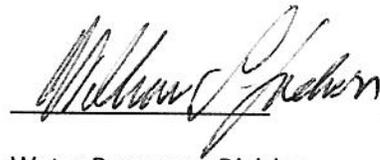
Superintendent

2/10/10

Date

Certification of Technical Adequacy:

/s/ Gary Smilie
for



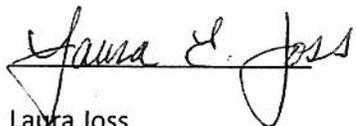
Water Resources Division

2/12/10

Date

Approved:

/s/ Laura Joss



Laura Joss

3/1/10

Date

Acting Regional Director, Intermountain Region

STATEMENT OF FINDINGS FOR FLOODPLAINS

Moose Headquarters Rehabilitation – Site Work Environmental Assessment

Statement of Findings for Floodplains

Introduction

Executive Order 11988, Floodplain Management, requires the National Park Service (NPS) and other federal agencies to evaluate the likely impacts of actions in floodplains. The objective of Executive Order 11988 is to avoid, to the extent possible, the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. NPS DO-77-2: Floodplain Management and Procedural Manual 77-2 provide NPS policies and procedures for complying with Executive Order 11988. This Statement of Findings (SOF) documents compliance with these NPS floodplain management procedures.

The purpose of this Floodplain SOF is to review the Moose Headquarter Rehabilitation-Site Work in sufficient detail to:

- Provide an accurate and complete description of the flood hazard assumed by implementation of the Selected Alternative (without mitigation).
- Provide an analysis of the comparative flood risk among alternative sites.
- Describe the effects on floodplain values associated with the Selected Alternative.
- Provide a thorough description and evaluation of mitigation measures developed to achieve compliance with Executive Order 11988 (Floodplain Management) and the NPS Floodplain Management Guideline 1993.

Proposed Action

The NPS is preparing the Moose Headquarters Rehabilitation – Site Work Environmental Assessment (EA). The Headquarters Rehabilitation Plan includes: rehabilitation of the Moose Maintenance Building and the former Visitor Center/Headquarters Building interiors; removal of several temporary buildings; the complete reconfiguration of vehicle and pedestrian traffic within the administrative complex and the Moose boat landing area; and site restoration work targeted to improve stormwater management. This EA analyzes the site work associated with the Moose Headquarters Rehabilitation Plan.

Under the proposed action, all elements of the project would be designed to result in an overall reduction in impervious surface within the area and improve stormwater management. Nearly all the existing asphalt would be replaced to provide positive drainage and direct run-off from paved areas through new oil-water separators. Several sediment and infiltration basins and bio-swales would be constructed to treat surface water runoff. Both gravel and asphalt may be used for resurfacing. A new, designated parking area for concessioner clients would be added at the entrance of the Moose Launch Road. Within this area a picnic/waiting area and restroom facilities would be added. New pedestrian trails would be added to provide connectivity between the Craig Thomas Discovery Visitor Center and Menor's Ferry, as well as from the Moose housing area to the Moose Post Office. Four temporary buildings would be removed resulting in an 8,000 gross square foot reduction in overall building space in the Moose Headquarters Area.

Site Description

The Moose Headquarters Area includes park headquarters, visitor use areas, administrative and maintenance facilities, and United States Post Office. The administrative area is bordered to the west by employee housing, to the north and east by the Snake River and associated river access, and to the south by the Teton Park Road and the Craig Thomas Discovery and Visitor Center.

“Critical actions” within the administrative area, include the Teton Interagency Dispatch Center, which is located on the first floor of the Moose Maintenance Building, and the communications vault, which includes radio and IT equipment, fuel storage, and archive storage.

Floodplain Extent

The best available data were used to determine the extent of existing floodplain boundaries and water surface characteristics of the Snake River. Floodplain maps produced by the Federal Emergency Management Agency (FEMA) (Report # 178) depict a portion of the former Visitor Center and maintenance area within the 100-year floodplain. However, a subsequent floodplain analysis of the Moose area conducted by NPS Water Resources Division (WRD), concluded the 100-year floodplain should be considered to be almost completely contained by the Snake River channel. The 500-year floodplain would exceed the channel capacity by roughly one to three feet, vertically.

Justification for Use of the Floodplain

The majority of the buildings and facilities in the Moose Headquarters Complex were constructed in the 1960s. Existing facilities include the former Visitor Center / Administration Building, Moose Maintenance Building, temporary administration buildings, and a wastewater treatment plant and lab. The Moose Maintenance Building includes offices, the park dispatch center, fire management office and cache, vehicle repair bays, a meeting room, workout room, and storage. A sand shed, work yard area, and two boat ramps are also located within the complex. There is currently space for visitor parking and access to the Moose Boat Landing, as well as parking and access for maintenance or administrative use. Park staff consists of approximately 160 permanent employees and approximately 250 seasonal employees. There are several divisions that comprise the park staff: ranger activities; interpretation; science and resource management; facility management; business resources; and administration. All of these divisions have the majority of their operations in the Moose area. Relocation of any of the buildings and facilities, including the Teton Interagency Dispatch Center, would impose considerable cost and resource impacts.

Description of Site-Specific Flood Risk

The NPS WRD floodplain analysis determined the former Visitor Center developed area to be located partially within the 500-year floodplain. The former Visitor Center / Administrative Building itself is shown to be located outside the 500-year floodplain. The maintenance facility and associated buildings, is totally within the 500-year floodplain, which would also be the regulatory floodplain for this structure (emergency services are located there). For the basis of this analysis, the entire project area would be considered to be within the 500-year floodplain.

Flood Frequency and Hydraulic Analyses

High magnitude floods in the area of Moose may occur due to tributary floods, large releases from the dam, and a combination of both, or, in the worst-case scenario, a sudden dam failure. Flood frequency in the Moose area is difficult to predict, as the gages which measure tributary input as well as dam release, have not been in place very long. The U.S. Army Corps of Engineers developed four models and concluded (WRD, 2001):

I. The 100-year flood upstream of the Gros Ventre River confluence would be affected by dam operations and would likely be in the range of 22,900 cfs. It is estimated that the flood would be mostly contained in the river channel.

II. The 500-year flood would not likely be affected by the dam operation and, therefore, would be substantially greater estimated to be at 35,470 cfs. Modeling predicts it would subject the maintenance area to flood depths of one foot or less.

III. The probable maximum flood is estimated to discharge at 39,500 cfs. Modeling predicts probable maximum flood would subject the maintenance area to flood depths of two feet. It also predicts overtopping the Teton Park Road west as far as the entrance station and a portion of the Moose-Wilson Road. It could also threaten the Snake River Bridge.

IV. It is estimated a dam break would result in 87,000 cfs and would take approximately 5 hours to reach Moose. This would come in a flood wave that would inundate the entire Moose area with 3-6 feet of water and with 3-4 feet per second velocities. It is predicted to overtop the Snake River Bridge, isolating everything on the inside road.

Flood Conditions

Peak discharges are usually produced by snowmelt in the spring with possible summer pulses resulting from thunderstorms. Flash flooding is unlikely; however, a springtime rain on snow event could produce a large and rapid rise in the river, as it did on June 11, 1997. Moderate flood conditions in the Moose area occurred due to spring snowmelt within the tributaries. The Jackson Lake Dam was still storing most of the incoming runoff from the upper watershed at that time. Flood conditions would have been much worse if the release at from the dam were necessary at the same time. The 1997 peak flow (25,300 cfs, with a stage of 15.25 feet) resulted in bank full conditions in the upstream reach of the Moose area and slight over bank flooding in the area of the boat launches. There was substantial bank loss on the west bank upstream from the bridge. The river stayed almost all contained within the channel and did not result in any hazardous or costly flooding in the Moose area. The bank loss in on the west side was the largest risk (WRD 2001).

In 2005, the park installed stone barbs north of the bridge to redirect flow from the bank during large flow events. The barbs have been successful in trapping finer sediments during flow events and in stabilizing the bank.

Floodplain Mitigation

With the depths and velocities associated with the 500-year flood plain, relocating "Critical Actions" outside or above the flood level could mitigate most adverse affects. The park would be doing the following in the preferred alternative:

- The Dispatch Center would be relocated to the second floor of the Moose Maintenance Building.
- Irreplaceable artifacts would be stored in waterproof containers and/or on upper floors.
- The park is replacing the telecomm vault to protect all the radio and IT components within a modern, water-tight structure.
- Decreasing development, including a reduction in 8,000 square feet of building space, reduction in impervious surface, and substantially improved stormwater management, all provide beneficial impacts to the floodplain.
- The park would place berming or some other barrier adjacent to the fuel station area.

- The water treatment facility could be flood-proofed or made resistant to the 500-year flood stage.
- Building a small levee around the complex may be considered.

Based on NPS guidelines, no mitigation is required for extreme or dam-break flood events. However, preparation for such disasters should be considered due to the risk of human life. To guard against these potential floods, an agreement of prompt notification should be established between the Bureau of Reclamation and the park. An evacuation plan for Moose was developed.

Conclusion

The Preferred Alternative would substantially reduce potentially hazardous conditions associated with flooding by reducing the amount or relocating/waterproofing critical infrastructure within the 500-year floodplain in Moose. Decreasing development, including a reduction in 8,000 square feet of building space, reduction in impervious surface, and substantially improved stormwater management, all provide important beneficial impacts to the floodplain.

The NPS concludes that the Preferred Alternative would reduce the impacts of potentially hazardous conditions associated with flooding in Moose. Mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values, and loss of property or human life would be strictly adhered to during and after the construction. Individual permits with other federal and cooperating state and local agencies would be obtained prior to construction activities. No long-term adverse impacts would occur from the alternatives analyzed.

Therefore, the NPS finds the Preferred Alternative to be acceptable under Executive Order 11988 for the protection of floodplains.

Ref: L54 (2380) GRTE/ General, Floodplain Analysis for the Snake River in the area of Moose, conducted by NPS Water Resources Division, Michael Martin, Hydrologist, April 5, 2001

Executive Order 11988, Floodplain Management, May 24, 1977

24 CFR Subtitle A § 55.20 Subpart C – Procedures for Making Determinations on Floodplain Management