

1994

BIOLOGICAL ASSESSMENT FOR  
MAINTENANCE OF BANK STABILIZATION  
STRUCTURES MISSOURI NATIONAL  
RECREATION RIVER GAVINS POINT DAM  
TO PONCA STATE PARK, NEBRASKA

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**BIOLOGICAL ASSESSMENT  
FOR  
MAINTENANCE OF BANK STABILIZATION STRUCTURES  
MISSOURI NATIONAL RECREATION RIVER  
GAVINS POINT DAM TO PONCA STATE PARK, NEBRASKA**

**I. PROJECT LOCATION, DESCRIPTION, PURPOSE, AND AUTHORIZATION**

The location of the proposed maintenance construction project discussed in this document is located between Gavins Point Dam, South Dakota and Ponca, Nebraska, at specific locations as listed in the accompanying plans and specifications.

The proposed construction consists only of maintaining those structures that can reasonably be repaired to alleviate erosion problems for the purpose of maintaining the structural integrity of the existing structures. Any structure that is beyond repair would not be reconstructed, since it would no longer qualify as maintenance. There are nine existing projects within the Missouri National Recreation River (MNR) segment of the Missouri River. Each singular project consists of numerous erosion control structures that together, provide erosion protection for a particular bend or reach of the river.

"MAINTENANCE" of a structure is defined as rebuilding or replacing riprap or other materials in sufficient quantity to bring that structure up to original lines and grade or to its as built design and no further.

"PREVENTIVE MAINTENANCE" is defined as new construction or modifications within an existing project boundary; e.g., work between River Mile (RM) 799.65 to RM 797.70 (RB) at the Cedar County Park project.

"NEW CONSTRUCTION" is defined as construction outside of any existing project boundary.

"New construction" or "preventative maintenance" of any kind is not being considered for the proposed maintenance project. Should any new construction or preventative maintenance be considered in the future, then endangered species consultation would also be initiated.

Endangered species considered in this biological assessment include the bald eagle, peregrine falcon, least tern, piping plover, pallid sturgeon, American burying beetle and Western prairie fringed orchid.

## II. AUTHORIZATION

The Wild and Scenic Rivers Act, P.L. 90-542, was enacted in October 2, 1968. In passing this legislation, Congress stated that:

It is hereby declared to be the policy of the United States that certain selected rivers of the nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing conditions to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

The MNRR is to be administered under the provisions of the Wild and Scenic Rivers Act which also provides for the installation of erosion control features on this reach that are compatible with river designation. One of the objectives listed in the MNRR Management Plan is to "Assure continued effectiveness of erosion control features."

Section 32 of the Streambank Erosion Control Evaluation and Demonstration Act of 1974 as amended by the Water Resources Development Act of 1976 respectively, authorized the construction of demonstration bank erosion control measures from Fort Peck Dam Montana to Ponca State Park, Nebraska. Nine demonstration projects were constructed in the MNRR. Funding for operations and maintenance for the existing structures is currently obtained by the Missouri River Bank Stabilization Association under the Missouri National Recreation River. Appropriations are likely to continue as long as maintenance needs exist. Of the 9 projects constructed downstream from Gavins Point Dam, the breakdown among the local sponsors is as follows: Yankton County, 1; Clay County, 2; Union County, 1; Lewis and Clark Natural Resource District, 5.

The proposed maintenance work for the existing projects would be performed under the authority of the MNRR. This authority to do maintenance applies only to those existing projects within the MNRR segment of the Missouri River.

### III. STRUCTURES REQUIRING MAINTENANCE

#### GENERAL

From 1973-1978 and from 1979-1981, bank stabilization projects on the Missouri River were authorized under Section 32 of the Streambank Erosion Control Evaluation and Demonstration Act of 1974 as amended by the Water Resources Development Act of 1976 respectively. Since these structures were built, deterioration of certain portions of some structures has occurred.

#### STRUCTURES

Three types of structures are included in the proposed maintenance work. These are revetments, refusals, and hardpoints. These structures were originally placed from the bank. Limited portions of the haul roads to these structures may be washed out by bank erosion in limited areas.

Revetments consist of stone placed longitudinally on an eroding bankline to various heights. Revetment armors the bankline soils against the erosive currents only and does not force the currents away from the bankline.

A refusal is part of the revetment. It is a stone root that ties the upstream end of a revetment into the bankline to prevent erosive currents from flanking and compromising the structure. It is covered with soil, seeded, and therefore usually not visible.

Hardpoints are short dikes built to approximately 50 feet in length. Hardpoints are designed to protect a bankline only, without forcing the channel away from the bankline. The roots of these structures also extend into the bankline and are covered with soil and seeded.

Illustrations of these structures are included at the end of this assessment.

Maintenance of the present structures is not intended to alter the present morphology of the Missouri River.

#### CONSTRUCTION SCHEDULE

Construction is scheduled to begin in the spring of 1994 until the work is complete or weather no longer permits.

The Corps and the Service will be aware of those sites where terns and plovers are active. The contractor will be given the locations of construction sites where there is no activity within 1/4 mile in any direction. The contractor would not be allowed to construct within any active site no matter what the time of year.

However, for Corps contracting purposes, it is assumed that all of the terns and plovers will begin nesting on May 1 and will have abandoned their nests by September 1.

Likewise, construction would not be allowed within 1 mile of an active eagle nest no matter what the time of year, however, for Corps contracting purposes, the normal nesting period of March 1 through August 15 will be used.

#### IV. ENVIRONMENTAL RESOURCES

Environmental Setting. The MNRR portion of the Missouri River is a meandering channel with chutes, backwater marshes, sandbars, islands, changing shorelines and variable current velocities. On average, this portion of the river is about one-half mile wide and 6 feet deep, with maximum depths rarely exceeding 20 feet (Groen and Schmulbach, 1978).

Because river sediment is captured above Gavins Point Dam, extensive bed degradation has occurred over the past 25 years. The channel has degraded an average of 5 to 6 feet (Corps, 1991a). The channel has also widened in many areas where the shorelines are composed of highly erodible material. In some locations, the channel is now over a mile wide (Corps, 1991a). The banks in many areas have been stabilized for protection from extensive erosion. In total, about 32 miles or nearly 27 percent of the total bank mileage has been stabilized (Corps 1991a).

The river bottom in the unchannelized reach is typically sand, but some segments are partly armored with gravel or cobble and in some areas, such as sharp bends, the bottoms are solid clay (Modde and Schmulbach 1973). In the straighter stretches, dunes develop, moving and shifting during high flow periods. Sand dunes have declined since the construction of the reservoirs. Over 4,700 acres of sandbar habitat have been lost, and as of 1985, only 1,500 acres remained (Corps 1992a). A more recent survey in 1991 indicates only 500 to 1000 acres remain. Channel degradation and siltation of shallow areas have also contributed to the loss of marshes, backwaters, and chute habitats. Siltation fills up the marshes while bed degradation reduces the frequency of flooding and decreases ground water levels (Corps 1993a).

Hydraulic Nature of the Historical River. The historical Missouri River was characterized by high flows in the spring and early summer and low flows in the late summer and winter. The highest flows normally occurred in June probably averaging in excess of 65,000 cfs and peaking at flows well over 100,000 cfs. The low flows in December averaged 10,000 to 20,000 cfs. The aquatic terrestrial transition zone or low bank areas in historical times were probably inundated over 50% of the time during March through August when the flows were higher. This transition zone provided the native fishery much in the way of their required seasonal habitat for spawning, food items, etc. The historical Missouri River during average late summer and fall flow conditions was a shallow river, 98% of which was composed of depths primarily ranging from 0.6 to 3 meters (with depths of 0.6 to 2 meters being most prevalent. Only about 2% of this historical river was composed of depths exceeding 3 meters. Velocities ranging from 0.3 to 0.76 meters per second appear to have predominated in the historical river (Latka, Nestler, and Hesse. 1993).

Hydraulic Nature of the Present River. The present Missouri River is not the historical river of yesterday. It has been impounded, its flows regulated, and its free flowing reaches subjected to degradation. It no longer is allowed to create avulsion and change course as it once did during historical flood events. Mapping from the 1890's shows us that the Missouri has not considerably changed its course since that time. Most old channel scours of the river that are visible in the flood plain are not recent but are remnants of earlier periods in time.

In contrast to the historical river, 13% of depths in the unchannelized regulated river are 3 meters deep and greater and occur in the main channel (Latka, Nestler, and Hesse, 1933). A deepening or degradation of the main channel of the river also reduces the wetted area of the river reducing the area of shallows while increasing the aquatic-terrestrial transition zone or low bank area. Lower velocities of 0.15 to 0.76 m/s occur less frequently in the regulated river while velocities of 0.76 to 1.22 m/s now occur more frequently (Latka, Nestler, and Hesse, 1933). High spring and summer flows have been reduced; and late summer, fall, and winter flows have been increased. With regulation of flows below the dams, the water temperature regime changed becoming colder, turbidity decreased, and the types of available habitat changed.

Stabilization vs. Channelization. Stabilization of the bank where it is eroding does not appear to train the thalweg or main channel of the river; channelization however does. Channelization consists of constricting the river and then training the main channel with revetment and dike fields. Bank stabilization protects the banks where they are eroding and allows the river to retain a dynamic hydraulic character by allowing the main channel or channels to meander within presently occurring natural banklines. Stabilization does, however, limit the rivers natural tendency to shift into a completely new channel.

Sediment Transport. Bankline erosion, bed movement, and sediment from the tributaries all contribute to the sediment load of the river. Both erosion of the bankline and bed movement do contribute to the sediment load of the river, however, sediments contributed by the tributaries during spring runoff and storm events are the primary sediment sources for the unchannelized river. Where an insufficient sediment load occurs, degradation continues to occur until the riverbed becomes armored.

Degradation. Degradation of the Missouri River channel below the dams was initiated in response to a lack of sediment load in the river. Degradation was still continuing when the Section 32 structures were constructed below Gavins Point Dam. Degradation of the main channel of this reach of the Missouri River has slowed but continues to gradually deepen the main channel. The greatest decreases in water surface elevation over time and distance occur

from just below the dam, at RM 812 and extend about 20 miles downstream to about RM 790. From RM 790 downstream, stage elevations continue to decrease but the rate of change is less than the upstream reach. Degradation in the upstream reach averages from about 11 feet at Gavins Point Dam, to about 7-1/2 feet within the first 20 miles downstream and to 5 feet at Ponca State Park, RM 753.

Degradation consequently has resulted in an increase in low bank areas at the expense of a decrease in wetted river perimeter and shallow aquatic habitats through a lowering of the water table. The sediment retaining capabilities of bank stabilization structures has contributed somewhat to this condition. Because these structures prevent erosion in a "sediment hungry" river, they naturally contribute, to a small degree, in some additional bed degradation (Remus & Nestler, pers. comm.).

Terrestrial/Riparian Habitat. Maintenance of the existing projects would likely not effect any significant changes in aquatic or terrestrial habitat from the present situation. Potential future new construction could induce possible secondary channel deepening due to gradual degradation and a simultaneous loss of wetted perimeter. A loss of the wetted perimeter reduces the shallow aquatic habitat that comprised most of the historical river. It also increases the amount of low bank area within the high banks of the river.

Aquatic Habitat. The historic Missouri River will likely never be recreated below the main stem dams because of lack of flooding and varied hydraulic conditions, increased velocities, lack of sediment with the associated degradation, reduced turbidity, colder water temperature regimes, introduction of a non-native fishery and increased flood plain development. Only those native fishes that are able to cope with these changed conditions will continue to survive in numbers.

Maintenance of selected existing structures could, however, provide desirable deeper areas with slower velocities conducive for feeding for the benefit of native fishes.

Ecosystems of Concern. The aquatic and terrestrial ecosystems previously discussed are important. However, special concern has also focused on the formation of sandbar habitat that develops in the unchannelized river and is used by shorebirds and other wildlife.

Two scenarios can occur which affect the quality and type of sandbars that can form provided that degradation is not a major factor.

In those reaches where erosion has been allowed to occur and the river has become wider, the velocities have also been reduced and there is less movement of bed material. Because the river has become wider, the normal release patterns from the dams cannot build higher sandbars because the water surface is spread out over a larger area. It therefore builds lower and larger, sandbars and point bars. This lower and less active type of sandbar is likely to become vegetated and is also subject to flooding at lower discharges.

In those reaches where limited stabilization has occurred the river stages are likely to be more variable and higher. This results in the formation of smaller sandbars. Because the higher velocities allow increased movement of sediments, these sandbars are more easily created and likewise more easily eroded. These smaller but more active sandbars are less likely to become vegetated. If degradation is a factor here, the effect could only result in shrinking of the wetted perimeter and in fewer, smaller islands.

Wetland Quality and Quantity. The proposed measures would not affect present wetlands. Although wetlands are present, most of the original wetlands have disappeared or have been degraded because of bed degradation and flood plain development, as well as from the absence of annual flooding.

Mitigation. Mitigation was never authorized by Congress as part of the original Section 32 bank stabilization projects. Much of the Section 32 projects constructed at that time were considered by some in the Corps to be mitigation. Protection for both the Karl Mundt Eagle Refuge below Fort Randall Dam in South Dakota and the only bald eagle nesting area in North Dakota near Stanton, were authorized under Section 32. Construction easements, however, were taken on the maintenance rights of way. At the time, the U.S. Fish and Wildlife Service (USFWS) had difficulty justifying speculative losses and Congress had never authorized mitigation for the demonstration projects. The recommendations of the USFWS were therefore acknowledged by the Corps and then construction of the Section 32 projects was undertaken.

## V. ENDANGERED AND THREATENED SPECIES IN THE AFFECTED AREA

The following endangered and threatened species are present in the affected area and need to be addressed in accordance with Section 7 of the Endangered Species Act.

<u>Listed Species</u>	<u>Expected Occurrence</u>
Bald eagle ( <u>Haliaeetus leucocephalus</u> )	Migration, breeding/nesting winter resident
Peregrine falcon ( <u>Falco peregrinus</u> )	Migration
Interior least tern ( <u>Sterna antillarum</u> )	Migration, breeding/nesting
Piping plover ( <u>Charadrius melodus</u> )	Migration, breeding/nesting
Pallid sturgeon ( <u>Scaphirhynchus albus</u> )	Resident
American burying beetle ( <u>Nicrophorus americanus</u> )	Resident
Western prairie fringed orchid ( <u>Platanthera praeclara</u> )	Resident

The Endangered Species Act requires that the Federal action agency shall, in consultation with and with the assistance of the Secretary (USFWS), ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat of such species.

### Impacts of the Proposed Project on the Endangered and Threatened Species and their Habitat.

Bald eagle. The bald eagle migrates spring and fall statewide in South Dakota and Nebraska, but primarily along the major river courses. It concentrates in preferred roosts along the Missouri River during winter and could nest in flood plain forest. Trees of most importance are the larger perch trees located on the riverbanks. Larger trees are important for the eagles as fishing trees as well as in wooded areas for roosting and possible nesting. Service and Corps personnel would be aware of any possible nesting activity in the area.

Actions to be taken to prevent impact to the Bald Eagle:

1. No construction would be permitted within 1 mile of an active eagle nest during the courting/nesting period of March 1 to August 15 of any year. Any construction action during any time period would stop if that construction would affect bald eagle nesting.

2. Those trees greater than 6" in diameter which are most suitable for eagle perches and roosts will not be removed unless necessary and then only with the approval of the Corps construction inspector.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Therefore the proposed maintenance and construction would not be likely to adversely effect the bald eagle and its habitat.

Peregrine falcon. The peregrine falcon is an uncommon but regular seasonal migrant which preys upon the many medium sized birds and waterfowl that use the open river, open wetlands, and grasslands. It migrates spring and fall in South Dakota and Nebraska and is found primarily along the major river courses.

The proposed maintenance work is not likely to adversely effect the peregrine falcon as the habitat required by the falcon's prey species or the resting and roosting habitat needed by the peregrine falcon do not appear to be limiting factors. The construction that also is proposed is minor, would occur in a limited number of areas, and would not take place simultaneously.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Interior least tern and piping plover. Least terns and piping plovers nest on unvegetated or sparsely vegetated sandbars in the Missouri River channel. The normal nesting season for the least tern and piping plover is May 1 through August 15 and on occasion through September 1. Least terns feed on small forage fish and aquatic invertebrates in the shallow waters, and piping plovers forage for terrestrial insects and invertebrates on the exposed sandbars and beaches.

Actions to be taken to prevent impact to least terns and piping plovers:

1. No maintenance construction would be permitted within 1/4 mile of an active tern or plover nest in any direction, no matter what the time of year. Both Corps and Service personnel will be monitoring tern and plover nests throughout the summer months and will be cognizant of which sites are active. This information will

be given to Corps construction inspectors who will insure that the contractors do not disturb active nest sites. For contracting purposes, work periods will be included in the maintenance contracts, but the requirements above will remain applicable.

Stabilization on this reach of the Missouri River is unlike the "channelized Missouri River" in that the banks are stabilized where critical erosion areas are occurring only, and the river is not constricted to a specific width. This leaves the river to remain somewhat dynamic and still allow sandbars to form naturally within the high banks.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Therefore the proposed alternative would be unlikely to adversely affect the least terns or piping plovers or their present habitat.

Pallid Sturgeon. Pallid sturgeon are usually found in the main channel of the Missouri River with flows on the order of 1 1/2 to 2 feet per second. This fish is designed to live in those portions of the river with high turbidity and faster currents. Reproduction has not been documented in these fish for 15 years.

Observations of the side currents associated with the short hard points indicate that some of these structures may have potential to benefit the pallid sturgeon by creating small areas of favorable habitat. The currents associated with the hardpoints appear to recirculate drift material in deep slow moving waters adjacent to the faster deeper waters and therefore would enable the sturgeon to forage more successfully upon the drift as well as any forage fishes that are likewise attracted to these areas. Some structures therefore should provide habitat in a scenario where the river has become increasingly shallower due to erosion and widening of the channel.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Therefore the proposed maintenance project would not be likely to adversely affect the pallid sturgeon or its present habitat.

American burying beetle. The American burying beetle is a carrion feeder that buries its prey and then uses that prey in feeding and caring for its young below the surface of the ground. Habitat for the beetle has not been clearly defined. Although virgin or primary forest has been suggested habitat, recent captures in the Midwest since 1960 were in mixed agricultural lands including pastures and mowed fields as well as second growth woods and grassland/prairie habitat. The availability of significant humus and loose topsoil suitable for burying carrion is essential

because this beetle buries small dead animals in the soil upon which it lays its eggs. The nocturnal adults search for dead animals and upon finding one try to bury it by undermining the soil beneath the carcass. Eggs are deposited on the carcass thereby leaving the emergent larvae with a reliable food source until they pupate and become adults. Both the adults and larvae are scavengers eating both carrion as well as decaying vegetation.

Most past records in Nebraska for this beetle show that it has been collected near major watercourses such as the Platte, Elkhorn, Loup, and Dismal Rivers. This insect may have used the gallery forests of rivers and streams as natural pathways to enter the plains from the more forested regions to the east. The data suggests that the species is still present but is declining in the Midwest. It also suggests that the remaining beetle populations are usually found at the edge of the species range. The most plausible theory for the decline is change in, or loss of suitable habitat. The Missouri River Valley is important because of the past changes in habitat caused by man, such as the loss of open river channel, loss of woody vegetation, loss of adjoining wetlands and grasslands, declines in the water table, and conversion of flood plain to croplands.

Until more information is known, any habitat where enough humus and topsoil exists that is suitable for burying carrion could be considered potential beetle habitat. The probability for small animals and therefore their carcasses to be present in an area also would likely be a necessary habitat requirement for beetles. However, even though habitat that fits that description is plentiful and is not presently considered a limiting factor, accurate baseline information concerning the endangered burying beetle is needed to be able to determine the location of populations and their abundance.

Potential habitat does not appear to be a limiting factor for the beetle. No new lands would be needed to construct haul roads since the haul roads which would be used to maintain these structures were made when the structures were first built. Landowners also usually use these roads for river access.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Therefore, the proposed maintenance project would not affect the American burying beetle or its habitat.

Western prairie fringed orchid. The western prairie fringed orchid has been found closely associated with high water table areas, including wet mesic prairie and sedge meadows in alluvial soils of river flood plains. The plant communities supporting this orchid include tall-grass silt loam prairie or sub-irrigated sand prairies. While specific site types may vary, all sites are

typified by the tallgrass prairie habitat and a high soil moisture profile.

The haul roads to be used are currently located in the Missouri River flood plain in the remnant riparian woodlands or on cultivated lands. The haul roads to be used to maintain these structures were made when the structures were first built. Landowners also usually use these roads for river access. No new lands are anticipated to be used for haul roads.

Maintenance of revetment and the associated refusals would neither improve nor change any habitat from its present state.

Therefore, this permit action is not likely to adversely affect habitat required by the western prairie fringed orchid.

**CONCLUSIONS:**

The proposed maintenance for the existing bank stabilization structures located within the Missouri National Recreational River, Gavins Point Dam to Ponca State Park NE, as proposed, is therefore not likely to adversely affect the bald eagle, the peregrine falcon, the least tern, the piping plover, the pallid sturgeon, the American burying beetle or the Western prairie fringed orchid or result in the destruction of, or adverse modification of any habitat deemed critical to the bald eagle, peregrine falcon, least tern, piping plover, pallid sturgeon, American burying beetle or Western prairie fringed orchid.

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