Environmental Assessment

Fort Peck Flow Modification Mini-Test

March 2004

US Army Corps
of Engineers ®
Omaha District

This page intentionally blank

FINDING OF NO SIGNIFICANT IMPACT
Fort Peck Flow Modification Mini Test
Fort Peck, Montana

March 2004

In accordance with the National Environmental Policy Act and implementing regulations, an Environmental Assessment (EA) has been prepared describing the anticipated effects of the implementation of the Fort Peck flow modification mini test on the existing environment. The U.S. Army Corps of Engineers, Omaha District (Corps) prepared a draft EA that was circulated for public, agency, and Tribal review and comment prior to finalization.

Environmental and social issues relevant to the proposed project were identified during the scoping process and addressed in the EA. Concerns were raised about impacts to irrigation, water supply, reservoir levels, hydropower, eroding banks, cultural resources, and cottonwood forest. Concerns were also raised about the test in relation to the drought, potential for flooding, mosquito control efforts, operational precedent, and the scientific basis. In addition to initial scoping concerns, the EA also addressed the potential for impacts to endangered species, wetlands, fisheries, recreation, and socioeconomic resources.

There are no reasonable alternatives to conducting a mini test to achieve the following objectives:

- To test the long-term integrity of the spillway operating at higher flows,
- To test data collection methodology to be used during the mini test, and
- To gather data on temperature, based on various combined flows from the spillway and the powerhouse.

The lack of reasonable action alternatives is more thoroughly discussed in section IV of the EA. The mini test is intended to implement Reasonable and Prudent Alternative (RPA) II B (1) from the U.S. Fish and Wildlife Service's November, 2000 Biological Opinion. The mini test task is still included in the 2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System etc. dated December 16, 2003.

The Corps has tried to resolve as many issues as possible, but a few issues remain unresolved at this time. The implementation of the mini test will likely result in the erosion of private lands directly across from the spillway. The landowner and the Corps were not able to reach an agreement on the terms of an easement needed to construct bank protection structures using the funding available during fiscal year 2003. If the landowner wants to pursue such a structure prior to the mini test or to request a sloughing easement from the Corps, he would need to resubmit an application so the Corps could re-initiate the action.

The Assiniboine and Sioux Tribes of Fort Peck are opposed to the mini test. This EA addresses the Tribal concerns, none of which result in any significant impacts related to the mini test.

Proposals for flow-related actions from Missouri River dams have been controversial and political and are also the subject of lawsuits from at least two states. The final Master Manual Environmental Impact Statement (EIS), the resulting Record of Decision, and subsequent Annual Operating Plans will inform the public on flow issues outside of this mini test.

It is my finding, based on the EA, that the proposed Federal action would have no significant adverse impacts on the environment. The proposed mini test has been coordinated with the appropriate resource agencies and there are no significant unresolved issues. An EIS is not required.

Date: March 5, 2004

Kurt F. Ubbelohde
Colonel, Corps of Engineers
District Engineer

FINAL
ENVIRONMENTAL ASSESSMENT

Fort Peck Flow Modification Mini Test

U.S. Army Corps of Engineers

Mailing Address for Additional Copies:

Rebecca J. Latka, CENWO-PM-AE
U.S. Army Corps of Engineers
Omaha District
106 S. 15th St.
Omaha, Nebraska 68102
(402) 221-4602

March, 2004

This page intentionally blank

Table of Contents

EXECUTIVE SUMMARY ..... **VII**

I. INTRODUCTION **1**

MINI TEST PROPOSAL 1
BACKGROUND 1
Authorization for the Fort Peck Dam *1*
Authorization for the Mini Test *1*
Fort Peck Dam and Vicinity *2*
Missouri River below Fort Peck Dam *3*
SUMMARY OF PUBLIC INVOLVEMENT AND COORDINATION 6
Tribal Consultation *6*
Agency Scoping Meeting *9*
Public Scoping Meetings *10*
Comments on the Draft EA *14*

II. PURPOSE OF AND NEED FOR THE MINI TEST **17**

UNDERLYING PURPOSE FOR FLOW MODIFICATIONS AT FORT PECK 17
SPECIFIC PURPOSE OF THE MINI TEST 19
THE NEED FOR THE MINI TEST 19
Scientific Basis *20*

III. DESCRIPTION OF THE PROPOSED TEST **21**

GENERAL RELEASE ADJUSTMENT GUIDELINES 22
STRATEGY FOR CHANGING TO A NEW FLOW 22
CONSTANT FLOW PERIOD 22
POOL ELEVATION REQUIREMENTS 22
"STOP PROTOCOL" TO AVOID OR MINIMIZE IMPACTS 23
DATA COLLECTION 23

IV. ALTERNATIVES **25**

ALTERNATIVES CONSIDERED BUT REJECTED 25
ALTERNATIVES OUTSIDE THE SCOPE OF THE MINI TEST 26
NO ACTION ALTERNATIVE 26

V. EXISTING CONDITIONS **27**

ENVIRONMENTAL BASELINE AND EXISTING CONDITIONS 27
Water Quality *27*
Lake Levels/Discharge Volume *34*
Flooding/Drought *35*
Wetlands *35*
Cottonwood Forest *36*
Fisheries *37*
Threatened and Endangered Species *39*
SOCIOECONOMIC BASELINE & EXISTING CONDITIONS 45

Recreation 45
Hydropower 46
Riverbank Erosion 46
Irrigation 46
Water Supply 47
Socioeconomic 47
CULTURAL RESOURCES 50

VI. ENVIRONMENTAL IMPACTS OF THE TEST 53

ENVIRONMENTAL IMPACTS 53
Water Quality 53
Lake Levels/Discharge Volume 55
River Elevation and Flooding 55
Drought 56
Wetlands 56
Cottonwood Forest 57
Fisheries 58
Threatened and Endangered Species 58
SOCIOECONOMIC IMPACTS 60
Recreation 60
Hydropower 61
Riverbank Erosion 62
Irrigation 64
Water Supply 65
CULTURAL RESOURCES IMPACT ANALYSIS 65
TRIBAL ISSUES IMPACT STATEMENT 67
RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY 71
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES 71
CUMULATIVE IMPACTS 71
CONSISTENCY WITH OTHER PUBLIC PLANS AND DOCUMENTS 72
REFERENCES 73

List of Tables

Table 1. Ft. Peck Dam Discharge Comparison 5
Table 2. Mini Test Flow Scenarios 24
Table 3. Tailwater Temperature Data, 1990 to 1997 29
Table 4. Mean Daily Water Temperatures 2002 31
Table 5. Mean Daily Turbidity 2002 33
Table 6. 1994 Survey of Water Intakes 47
Table 7. Population and Race, Ft. Peck Counties, Year 2000 48
Table 8. Income/Persons Living In Poverty, Years 1997/2000 50
Table 9. Cultural Site Analysis 66

List of Figures

Figure 1. Parts of Fort Peck Dam 4
Figure 2. Relationship Among Related Missouri River Actions 18
Figure 3. Average June Lake Temperatures 28
Figure 4. Fort Peck Wetlands Composition 35
Figure 5. Missouri River Wetlands Composition Below Fort Peck 36

List of Maps

Map 1. Fort Peck Area Map 2
Map 2. Proposed Critical Habitat – Fort Peck Lake 40
Map 3. Proposed Critical Habitat – Missouri River Below Fort Peck Dam 41
Map 4. Anticipated River Elevation Increase due to Mini Test 56

Appendices

A. Draft Fort Peck Spillway Major Rehabilitation Study, August 2000

B. Biological Background Information

1. MRNRC Recommendation letter, September 1997
2. MRNRC Recommendation letter, September 2000
3. MRNRC Recommendation follow-up letter, September 2000
4. Biological Opinion Recommendation, November 2001
5. USFWS clarification letter for the Biological Opinion, February 2001
6. USFWS clarification letter 2 for the Biological Opinion, May 2001
7. COE letter to USFWS, October 2001
8. COE letter to USFWS, January 2002
9. USFWS response, February 2002

C. Fort Peck Dam Operations

D. National Historic Preservation Act Compliance

1. Scope of Work for Cultural Resources and TCP Inventory
2. Scope of Work for Traditional Cultural Properties Inventory
3. Corps' letter to the State Historic Preservation Officer-MT, dated February 6, 2002
4. State Historic Preservation Officer-MT response dated February 19, 2002
5. Tribal Resolution on Spring Rise, October 2001
6. State Historic Preservation Officer-ND response dated July 22, 2003
7. Summary of Cultural Site Information

E. Data Collection and Monitoring Plans

1. Summary of Studies and Fort Peck Flow Modification Biological Data Collection Plan, 2001
2. MTFWP Scope of Work for Biological Data Collection
3. Bank Erosion Monitoring
4. Least tern/Piping plover Monitoring and Contingency Plan
5. Scope of Work Fiscal Year 2004 - 2008 for Ft. Peck Biological Data Collection Plan
6. Larval Drift Study Scope of Work
7. Spillway Fish Net Scope of Work
8. Spillway monitoring Plan

F. Water Temperature Standards and Coordination

1. State and Tribal Water Quality Standards
2. Letter to the Montana Department of Environmental Quality dated December 20, 2001
3. Letter to the Fort Peck Tribes dated December 21, 2001
4. Reply from the Montana Department of Environmental Quality, February 1, 2002
5. Water Temperature Calculations for Mini Test

G. Checklist of Environmental Laws

H. Section 33 Bank Stabilization Proposal across from Spillway
1. Public Notice
2. Letter from Rector Law Offices, May 2003
3. Response from Corps, July 2003

I. Least Tern & Piping Plover Nesting Sites: Missouri River Below Fort Peck Dam

J. Pallid Sturgeon Sighting Maps

K. Missouri River Intake Locations And Elevations

L. Fort Peck Biological Monitoring Data
1. Summary of 2001 Activities, Biological Data Collection USGS
2. Movement and Habitat Preferences of Adult Pallid Sturgeon, 2001 Progress Report USFWS
3. Missouri River Cottonwood Study 2001
4. Summary of 2002 Activities, Biological Data Collection USGS
5. Movement and Habitat Preferences of Adult Pallid Sturgeon, 2002 Progress Report USFWS

M. Comments on Draft EA and Corps Responses to Comments
1. Summary
2. Comments and Responses

This page intentionally blank

Executive Summary

The Fort Peck flow tests consist of two separate actions: a mini test and a full test. Whether the data from these tests result in an operational change from Fort Peck Dam is currently unknown and will likely be based on the data collected. The underlying Federal purpose for the tests is to support the Endangered Species Act and the pallid sturgeon recommendations in the U.S. Fish and Wildlife Service's (Service) November, 2000 Biological Opinion on the Current Operations of the Missouri River, Kansas River, and Bank Stabilization and Navigation Project (Opinion).[1] Additionally, flow tests at Fort Peck Dam are included in the Corps of Engineers (Corps) recent 2003 Biological Assessment (BA) on the Missouri River Main stem Reservoir System, the Lower Missouri River, and the Kansas River[2] and are supported by the Service's December, 2003 Amendment to the 2000 Opinion. This Environmental Assessment (EA), however, is specific only to the mini test action. National Environmental Policy Act (NEPA) compliance for the full test will be accomplished through a separate NEPA document. The Final Missouri River Revised Environmental Impact Statement, Master Water Control Manual Review and Update (Master Manual)[3] is expected to be completed in the spring of 2004; however, it is uncertain which alternative will be selected for implementation.

The mini test consists of a discharge of up to 11,000 cubic feet per second (cfs) down the spillway for Fort Peck Dam for a period of approximately four weeks during the month of June. During the same time, at least 4,000 cfs would be released through the powerhouse, with total discharges (powerhouse + spillway) not to exceed 15,000 cfs. Anticipated flow combinations can be found in Table 2 on page 22. The primary objectives of the test are:

- To test the long-term integrity of the spillway operating at higher flows
- To test data collection methodology to be used during the mini test and full test
- To gather data on temperature, based on various combined flows from the spillway and the powerhouse

As a prerequisite to the mini test, sufficient water has to be available in Fort Peck Lake for the Corps to be able to discharge a known volume of water through the spillway gates. For the mini test to run as described, for the duration described, and to gain the best information on discharge volume and resulting temperatures, **at least five feet of water elevation is needed above the spillway gates** (e.g., lake level of at least 2230 msl[4]). Due to the ongoing drought in Montana, upper decile[5] or greater runoff would have to occur during the winter and spring of 2004 in order to run the mini test during June, 2005 (Bob Keasling, personal communication).

[1] The Opinion can be viewed at http://www.r6.fws.gov/missouririver
[2] this July 2003 BA can be found on the Master Manual webpage
[3] the draft Master Manual can be viewed at http://www.nwd.usace.army.mil
[4] mean sea level
[5] "upper decile" flow indicates a flow with a 10 percent chance of being met or exceeded in any given year

Alternatives

Since the primary objectives of the mini test are to gather data and to test data collection methodology, there are no feasible alternatives that could achieve this same purpose. Modeling of spillway function has been done in the past, but additional data is needed in order to project spillway function during prolonged flows. Modeling of projected temperatures at various flows has been done, but additional data is needed in order to determine the relationship among spillway discharge, dam discharge, and Missouri River temperatures. The inclusion of a "no action" alternative is required by NEPA and is discussed, but this alternative would not meet the objectives of the mini test.

Primary Benefits

The primary benefits of running the mini test would be as follows:

- The initial collection of data relating to spillway integrity at various discharges
- The initial collection of temperature information at various combinations of spillway/powerhouse discharges for use in temperature modeling for the full test and operational changes
- The temporary increase of water temperature in the Missouri River within a limited area downstream from the spillway (an underlying purpose for the test).
- The testing and standardization of methodology that would be used during the full test for collecting physical and biological data

Primary Impacts

The primary impacts anticipated during the mini test would be as follows:

- The likely erosion of up to 5 acres of land (and possibly irrigation intakes) directly across from the spillway
- The short-term, temporary increase in suspended solids and turbidity in the Missouri River immediately across and downstream from the spillway, associated with the erosion of up to 5 acres of land across from the spillway
- The loss of an estimated 61 gigawatt hours (GWh) of hydropower potential by discharging water down the spillway instead of through the powerhouse. This loss is estimated to be 1% of the total hydropower produced by the mainstem system. The economic cost of this loss is variable, depending on the value of energy when the mini test is actually implemented.

The Corps has pursued separate actions that would have avoided and/or minimized the above erosion impacts. However, these actions were not agreeable to all parties involved and did not develop to fruition.

Unresolved Issues

Existing conflicts having the potential to affect the decision maker are as follows:

- **Erosion.** Direct erosion across from the spillway would be likely as a result of the mini test. However, this erosion could be prevented by the construction of a structure at that location under the Water Resources Development Act 1986, Section 33 program. This structure was designed, approved, and funded. However, the landowner and the Corps could not come to agreement on the terms of the easement within the necessary timeframes for construction to begin using the funding available this fiscal year. If the landowner wants to pursue such a structure prior to the mini test, he would need to resubmit an application so the Corps could reinitiate the action. An alternative to the construction of a structure would be to purchase a sloughing easement in advance of anticipated erosion. This could also be accomplished through the Section 33 program; however, it is not the desire of the landowner. This option would be available to all landowners concerned about potential erosion, subject to approval and available funding.

- **Tribal Opposition.** The Assiniboine and Sioux Tribes of Fort Peck are opposed to the mini test. They have stated their opposition in several letters to the Corps, as well as in a resolution dated October 8, 2001. They are currently under the impression that the mini test was postponed from June, 2001 in order to resolve their issues; however, some of their issues (such as compensation if additional water treatment is needed due to turbidity) were outside of standard Corps' authorities. This EA addresses the Tribal concerns, none of which result in any significant impacts during the mini test.

- **Missouri River Flows.** Proposals for flow-related actions from Missouri River dams have been controversial and political; they are also the subject of lawsuits from at least two states. The draft Master Manual incorporated flow modifications out of Fort Peck dam for all alternatives except for the current water control plan. However, the Master Manual is being finalized, and a preferred alternative will likely be selected later this spring. It is uncertain if permanent flow changes for Fort Peck Dam will be included in that alternative. The final Master Manual EIS, the resulting Record of Decision, and subsequent Annual Operating Plans will inform the public on flow issues beyond the scope of this mini test.

This page intentionally blank

I. Introduction

Mini Test Proposal

The mini test is intended to address concerns about long-term spillway operations identified during the August 2000 Draft Fort Peck Spillway Major Rehabilitation Study. Pertinent parts of these studies can be found in Appendix A. Based on the results of these studies, long-term spillway safety during major floodwater discharge events may be of concern. An analysis of sustained or periodic flows was not included as part of either spillway engineering study. Additional spillway integrity data is needed under various flow regimes in order to determine how the spillway structure would tolerate various flow scenarios. Stress data would be collected from the spillway for flows up to 11,000 cfs during the mini test. This data could then be used to update models used in the previous studies to predict any spillway impacts associated with the implementation of the other spillway-related flow tests within the U.S. Fish and Wildlife Service's 2000 Biological Opinion (Opinion), such as the full test.

Background

Authorization for the Fort Peck Dam

Fort Peck Dam was initially authorized for the purpose of navigation by the 1935 Rivers and Harbors Act, with allowances for the possibility of future hydropower generation. The Fort Peck Act, approved May 18, 1935, authorized the completion of the dam, maintenance and operation of the dam, and hydropower generation. The Flood Control Act of 1944 authorized the construction of Garrison, Oahe, Big Bend, Fort Randall, Gavins Point dams, and administratively modified the operation of the Fort Peck Dam to incorporate it into the main stem reservoir system operations. The main stem reservoir system is authorized for multiple purposes including flood control, irrigation, navigation, and hydroelectric power. In 1986, The Water Resources Development Act (WRDA, PL 99-662) authorized recreation as a specific project purpose at Fort Peck. The lake and dam are used for flood control, irrigation, navigation, hydropower, domestic and sanitary use, wildlife, and recreation (U.S. Army Corps of Engineers, 2000a).

Authorization for the Mini Test*

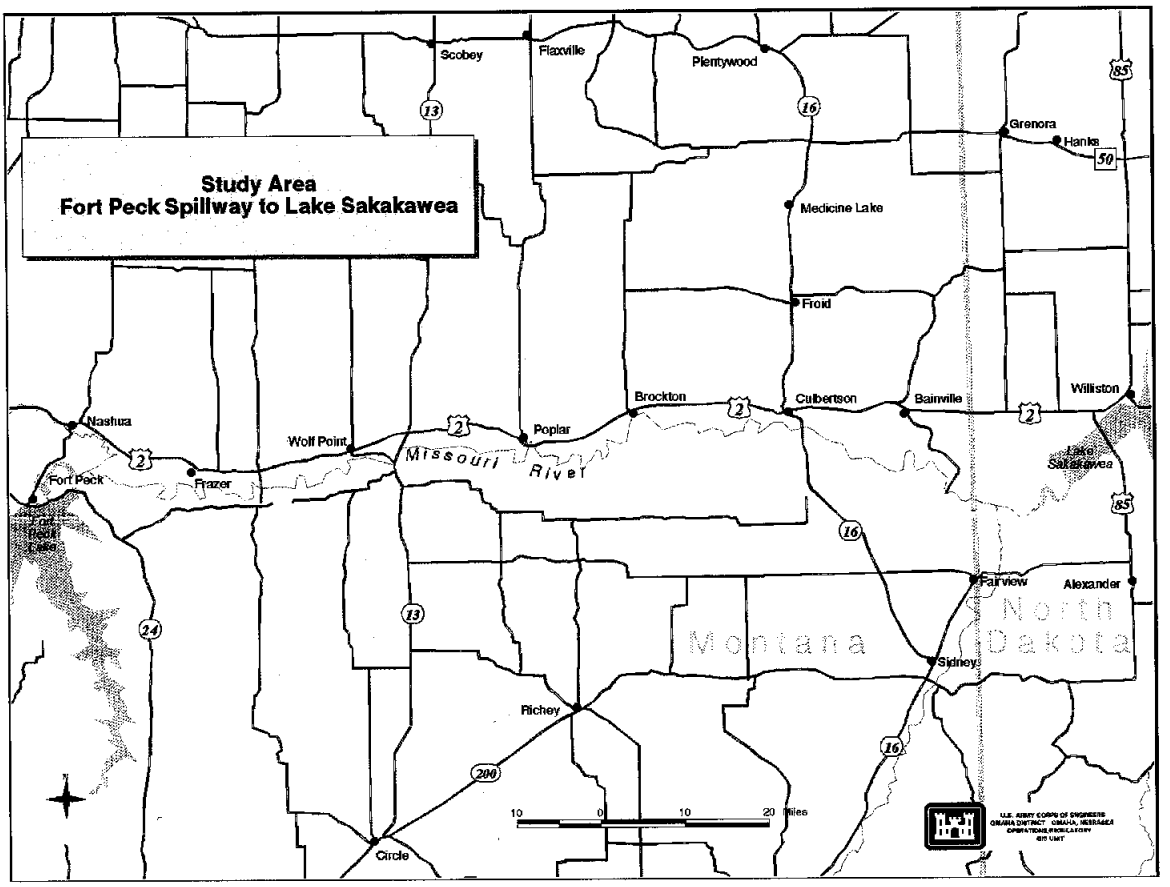
Under the general authorizing legislation for Fort Peck Dam, as supplemented, the Corps has the authority to test the stability of the spillway structure and to determine water temperatures resulting from such a test. This would be considered an "operation and maintenance" function of the dam. The authority to operate the dam for fish and wildlife also supports the fish-related tasks associated with the underlying purpose of the project.

* Throughout this document, headings for sections that address an issue raised during the scoping process are indicated by an asterisk.

Fort Peck Dam and Vicinity

Fort Peck Dam, located on the Missouri River, is 4 miles long, and 250 feet high at its highest point. The dam is located approximately 10 miles upstream from the confluence with the Milk River, and 1,772 miles upstream from the Missouri River mouth. Fort Peck Dam is the world's oldest and largest hydraulically-filled earthen dam, is listed on the National Historic Register, and is under consideration for National Historic Landmark status (Map 1).

Map 1. Fort Peck Area Map



The Fort Peck project is located 19 miles southeast of Glasgow, Montana in McCone, Valley, Garfield, Phillips, Petroleum, and Fergus Counties in northeastern Montana. After closure of the dam in 1937, the resulting reservoir, Fort Peck Lake, began to fill, ultimately covering 240,000 acres and storing 17,713,000 acre-feet of water at the maximum normal operating pool (elevation 2246 msl). Fort Peck Lake is the fifth largest man-made reservoir in the nation, with a typical length of 135 miles and width ranging from 2 to 5 miles. At maximum operating pool (2250 feet mean sea level), the surface area of the pool covers 246,000 acres.

Most of the Fort Peck Dam and Fort Peck Lake lie within the Charles M. Russell Wildlife Refuge (CMR) which is managed by the USFWS. Initially called the Fort Peck Game Range, this refuge was created on December 11, 1936 by Executive Order from President Roosevelt (1 CFR 2149). The CMR covers approximately 1.1 million acres.

The Fort Peck spillway is a constructed channel for reservoir overflow, which is generally used as an overflow channel when the reservoir elevation is in the exclusive flood zone. (See Figure 1 for a depiction of the dam's design). The spillway for Fort Peck Dam consists of sixteen 40-foot by 25-foot vertical lift gates with a discharge capacity of 230,000 cfs at maximum operating pool. The spillway crest elevation is 2,225 feet msl. Since 1967, spillway releases have occurred in conjunction with reservoir evacuation of high water due to flooding in 1975, 1976, 1996, and 1997.

Missouri River below Fort Peck Dam

A release of 9,500 cfs is equaled or exceeded 50 percent of the time at Fort Peck[6], but releases vary from a low of 4,000 cfs in dry years to as high as 20,000 to 35,000 in wet years. Channel capacity below Fort Peck Dam is approximately 35,000 cfs. Average daily releases since the Missouri River main stem system first filled in 1967 have ranged from zero to 35,400 cfs. Daily winter releases are generally 10,000 to 13,000 cfs during "normal" water years. Full hydropower capacity is 15,000 cfs. During 1975, a significant flood year, releases averaged 35,000 cfs in July. Minimum hourly releases are 4,000 cfs to maintain the trout fishery in the tailrace area (U.S. Army Corps of Engineers, 2001a). Table 1 puts these discharge values into context with the proposed mini test discharges.

[6] based on a duration curve developed from an analysis of historic daily flows

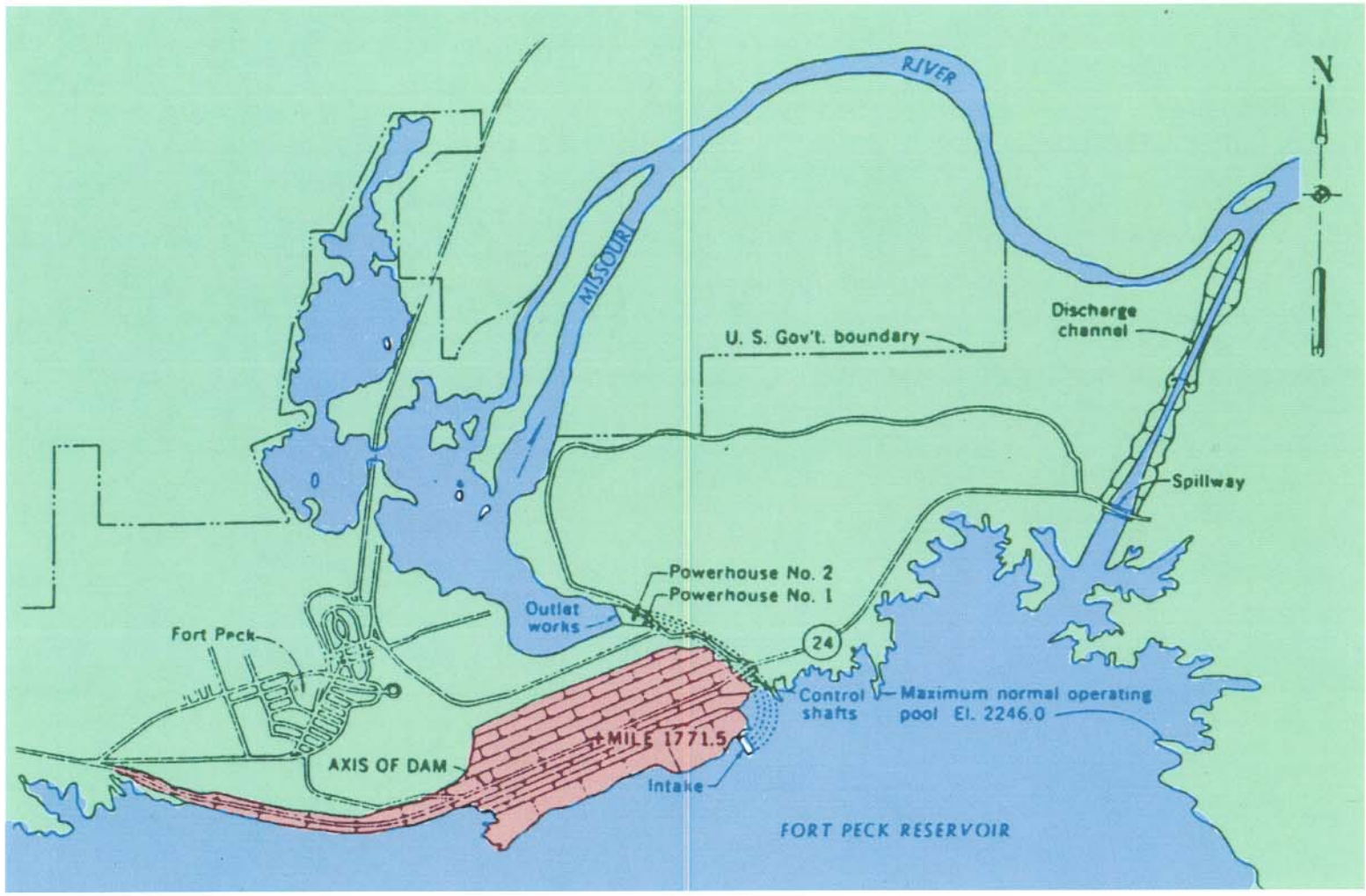


Figure 1. Parts of Fort Peck Dam

Table 1. Ft. Peck Dam Discharge Comparison
Mini Test vs. Historical Discharge (1943[7] - 2001)

EVENT	TOTAL DISCHARGE (powerhouse + spillway)	SPILLWAY
maximum daily discharge (Separate listing of powerplant and spillway releases began June 1981.)	35,400 Jul 7, 1975	Estimated 20,000
maximum daily discharge in June	35,100 (1975)	
channel capacity of river	35,000	Not applicable
highest average June discharge	26,200 (1975)	
maximum discharge in 1997 (high water year)	22,300 Nov 7, 1997	7,500
full hydropower capacity	16,000 at rated head	Not applicable
daily winter[8] discharge range[9]	16,000 - 4,500	0
average discharge in 1975 (high water year)	15,700	Not available
mini test total discharge (June)	**15,000 maximum**	**11,000 maximum**
average discharge in 1997 (high water year)	13,300 (year)	200 - 7,000
daily winter average - Jan/Feb	12,000	0
daily June average (1967 - 2000)	10,500	0
daily winter average - Dec	10,000	0
50 percent exceedance discharge	9,500	0
current minimum discharge (instantaneous)	4,000	0
historical minimum discharges	4,000 min daily avg 3/16-4/30, 2001; 9/4-11/25, 2001	0
	3,000 min daily avg 9/1-11/29, 1992; 9/9-10/28, 1993; 3/9-3/20, 1996	0
	0 daily avg 3/12, 1958; 8/12, 1959; 12/12, 1960	0

[7] Fort Peck began generating hydropower in July, 1943
[8] high flows occur in winter for hydropower purposes (highest power demand)
[9] 1967 - 2001

Summary of Public Involvement and Coordination

The scoping process for the Fort Peck mini test began in October 2000 with public, agency, and Tribal meetings. Pre-scoping meetings with the Tribes began in August, 1999 on general flow-related issues, and in August, 2000 for the mini test specifically. In addition to verbal comments, written comments on the mini test were received. Comments were summarized, grouped by category, and are addressed in this document to the best extent possible with existing information.

Tribal Consultation

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000 and other Army, Corps, and Northwestern Division Policies on Consultation require the Corps to consult on a government-to-government basis with federally recognized Tribes on activities that have the potential to impact Tribes, Tribal assets, or Tribal trust resources.

The initial Tribal consultation meetings on the mini test were held on August 7 to 9, 2000 near Poplar, Montana on the Assiniboine and Sioux Tribes of the Fort Peck Reservation. Representatives from the Fort Peck Tribe were in attendance. Non-Tribal attendees included Corps' District personnel from Omaha, Kansas City, and the Fort Peck Project office. Additional information on Tribal consultation and cultural resources compliance can be found in Appendix D.

In addition to the meetings held in Montana, the following Tribes were also informed about the project and are part of the Corps' formal consultation process:

- Fort Belknap
- Three Affiliated Tribes (Mandan, Arikria and Hidatsa Nations)
- Crow
- Northern Cheyenne
- Salish-Kootenai

A summary of consultation actions, including meetings and written correspondence, is presented below. Phone and e-mail correspondence are not included in this summary.

August 6, 1999	Initial consultation meeting with the Fort Peck Tribes on flow-related issues and the Master Manual; Poplar, Montana.
August 8, 2000	Initial consultation meeting with the Fort Peck Tribes on the mini test; Poplar, Montana.
September 12, 2000	Corps sends letter to Tribal chairmen, notifying the Tribes of the public scoping meetings for the mini test and full test being held in the vicinity (Wolf Point, Montana).

October 17, 2000	Corps receives letter from the Bureau of Indian Affairs providing comments on the test (the letter didn't specify which test).
November 20, 2000	Corps receives letter from the Fort Peck Tribes providing comments on the mini test, full test, and ongoing operational changes (Master Manual).
December 7, 2000	Corps sends a letter reply in response to the Fort Peck Tribes' November 20 letter. This letter includes a plan to address Tribal concerns throughout the mini test, full test, and Master Manual process. This letter also states which Tribal issues are outside Corps' authorities to implement.
December 14, 2000	Second consultation meeting with the Fort Peck Tribes; Poplar, Montana.
December 22, 2000	Corps receives request from Senator Conrad's office to address a November 30, 2000 letter from the Trenton Indian Service Area. The November 30 letter indicated opposition to the tests, in part due to "a lack" of consultation on the flow modification plan (assumed to be the mini test and full test).
January 23, 2001	Corps responds to Senator Conrad's office, indicating that the Corps will include the Trenton Indian Service Area in future consultation efforts. *The Corps project manager was in the process of scheduling a meeting with the chairman of the Trenton Indian Service, then a new chairman was elected.*
February 16, 2001	Third consultation meeting with the Fort Peck Tribes on the mini test and the full test; Poplar, Montana.
March 19, 2001	Corps receives a letter from the Fort Peck Tribes, following up on the consultation meeting.
April 30, 2001	Fourth consultation meeting with the Fort Peck Tribes on the mini test and the full test; Poplar, Montana.
May 3, 2001	First consultation meeting with the Trenton Indian Service on the mini test and the full test; Trenton, North Dakota.
May 30, 2001	Corps receives another comment letter from the Fort Peck Tribes, referring to the April 30 consultation meeting.

October 5, 2001	Corps receives comment letter from Fort Peck Tribes on the Master Manual Revised Draft EIS, referencing flow modification actions.
October, 2001	Corps receives cottonwood survey report from Fort Peck Tribes.
February 13, 2002	Fifth consultation meeting with the Fort Peck Tribes on the mini test, full test, and Master Manual; Poplar, Montana.
March, 2002	Corps sends letter to Fort Peck Tribes replying to issues raised in the March 19 and May 30 letters, as well as during the meetings held on February 13, 2002, April 30, 2001, and February 16, 2001.

Summary of Tribal Issues

The following summary of Tribal issues was determined based on letters received and feedback from consultation meetings. The comments received address the full spectrum of flow modification actions, ranging from the mini test through the potential for full implementation of a flow modification from the dam. This EA only addresses comments related to the mini test, however all Tribal issues are identified below. Additional information on how the Corps is addressing Tribal issues can be found in Chapter VI of this EA. Tribal concerns include:

- lack of consultation and coordination on the mini test and full test
- impact on Tribal water intakes
  - a plan for protection of the intake site and related facilities
  - a plan for mitigation and/or replacement of facilities due to impacts from the full test
  - a mechanism for financing repairs/replacement of intakes at Federal cost
  - a plan for funding the additional costs of treating Missouri River water
  - a plan for protection, mitigation, replacement, and funding impacted existing intake sites along the north bank of the river within the Reservation boundaries
- impact of the mini test, full test, and any future operational changes on the erosion of the north bank of the Missouri River
- safety during the tests
  - plan to notify water users
  - reservoir flood control capability prior to the test
  - spillway performance during the tests
- impacts to human remains and cultural, historical, and archeological resources
- identify benefits to the Tribes, their lands and resources, resulting from proposed revisions in the operation of Fort Peck Dam
- impacts of the mini test, full test, and ongoing operational changes on
  - aquatic habitat
  - riparian habitat (especially cottonwood forests)
  - endangered and threatened species
  - other species
- impacts to the Tribal hydropower allocation

- baseline development and monitoring
  - river banks
  - river bed
  - suspended sediment and bedload
  - aquatic habitat
  - riparian habitat (especially cottonwood forests)
  - other resources and facilities

Agency Scoping Meeting

One agency scoping meeting was held in Helena, Montana on October 2, 2000. The mailing list was developed from the Master Manual mailing list, initially selecting agencies in Montana and North Dakota. State water resource agencies and state game offices for all states within the Missouri River basin were included on the distribution. A total of 91 letters were sent out to agency representatives from the following agencies:

- U.S. Fish and Wildlife Service
- U.S. Bureau of Reclamation
- Western Area Power Administration
- State Historic Preservation Offices (Montana and North Dakota)
- U.S. Geological Survey
- Bureau of Indian Affairs
- U.S. Department of Agriculture
- Fort Peck Advisory Council
- Montana Department of Natural Resources and Conservation
- Department of Transportation
- Natural Resources Conservation Service
- Environmental Protection Agency
- National Park Service
- Buford-Trenton Irrigation District
- Roosevelt County Conservation District
- Bureau of Land Management
- Missouri River Basin Association
- Corps of Engineers (local project and regulatory offices)
- State game offices (Montana, North Dakota, South Dakota, Nebraska, Iowa, Missouri, Kansas)
- State water resources offices (Montana, North Dakota, South Dakota, Nebraska, Iowa, Missouri, Kansas)

Five agency representatives and one non-agency representative (American Rivers) attended the meeting in Helena. The following agencies were represented at the meetings:

- Western Area Power Administration
- Montana Department of Fish, Wildlife, and Parks

- U.S. Geological Survey
- Montana Department of Natural Resources and Conservation
- U.S. Fish and Wildlife Service

Public Scoping Meetings

Three public scoping meetings were held to date. Letters were sent to 117 members of the public, 18 political representatives, and 21 Tribal members inviting them to the meetings. The mailing list was initially developed from the Master Manual mailing list; however, names have been added as a result of the public meetings.

In addition, press releases were sent to the following media outlets:

- Radio Stations
  - KOJM/KPOX - FM — Havre, Montana
  - KCAP - AM — Helena, Montana
  - KXLO/KLCM - FM — Lewistown, Montana
  - KEYZ Radio — Williston, North Dakota
  - Prairie Public Radio — Bismarck, North Dakota
  - KBMR/KQDY - FM — Bismarck, North Dakota
  - KEYZ/KLAN - FM — Williston, North Dakota
  - KDPR - FM — Bismarck, North Dakota
  - KFYR/KYYY- FM — Bismarck, North Dakota
- Television Stations
  - KUMV - TV — Williston, North Dakota
  - KBOM? — Bismarck, North Dakota
  - KIZZ? — Minot, North Dakota
  - KUMV - TV — Williston, North Dakota
  - KFYR - TV — Bismarck, North Dakota
  - KKOA — Minot, North Dakota
- Newspapers
  - Helena Independent - Record — Helena, Montana
  - Wolf Point Herald News — Wolf Point, Montana
  - Williston Plains Reporter — Williston, North Dakota
  - Williston Herald — Williston, North Dakota
  - Bismarck Tribune — Bismarck, North Dakota
  - Bismarck Tribune — Valley City, North Dakota
  - Minot Daily News — Minot, North Dakota

Public scoping meetings were held in Glasgow, Culbertson, and Wolf Point, Montana during October 3 and 4, 2000. Additional meetings were planned for November 6 in Williston, North Dakota, and November 7 in Culbertson, Montana. However, a severe winter storm limited participation at the Williston meeting and resulted in the cancellation of the Culbertson meeting due to road closures. A make-up meeting was held in Culbertson on February 15, 2001.

Corps representatives were present to answer questions about the tests and to receive feedback or concerns about the tests. The meetings were open-house format, and tables were set up to address the following topics:

- NEPA/Biology
- Cultural Resources/Tribal Issues
- Erosion/Spillway Stability
- Mini test/Full Test Project Description

Meeting Date	Meeting Location
Glasgow, MT	October 3, 2000
Culbertson, MT	October 4, 2000
Wolf Point, MT	October 4, 2000
Williston, ND	November 6, 2000
Culbertson, MT	November 7, 2000[10]
Culbertson, MT	February 15, 2001[11]

Written Scoping Comments

Comment forms for the mini test and for the full test, as well as stamped, addressed envelopes were available for all attendees. Almost all of the 200 comment forms for each test were distributed at the public meetings, with approximately 20 forms (and envelopes) for each test remaining left at the Helena Regulatory office and the Fort Peck Project office. Comments were also received by phone, e-mail, and by personal letter. The comment period for the mini test was extended from November 1 to November 22, 2000 in response to requests from the public. All comments were included in the EA analysis, however, regardless of whether the comment was received prior to November 22.

Based on verbal and written scoping comments (about 30 letters) received from the Tribes, agencies, and the public, concerns have been expressed in the following general categories:

- Erosion
- Irrigation
- Water supply
- Lake levels
- Operational precedent
- Hydropower impacts
- Drought
- Discharge volume
- Scientific basis
- Mosquito control
- Flooding
- Paddlefish impacts

[10] cancelled, due to snowstorm
[11] replaced 11/7/00 meeting

Issue statements have been developed using the Tribal and public feedback to further clarify issues under each general category.

Erosion
What is the impact on lands located directly across from the spillway?

How will the Corps compensate for eroded lands?

Can the Corps protect lands from erosion (e.g. bank stabilization)?

Can the Corps open up (dredge) the mudflat downstream from the spillway[to allow for greater channel capacity]?

Irrigation
What is the impact on irrigation intakes and pumps located directly across from the spillway?

Can the Corps protect or compensate to avoid impacting these intakes?

Concern about irrigation intake problems due to low water levels upstream from the spillway during low discharges out of Fort Peck.

Water supply
Would the test increase water supply turbidity levels?

Would the test affect water supply intakes through erosion or sedimentation?

Reservoir levels
Can the Corps avoid lowering Fort Peck Lake during the forage fish spawn?

Can the Corps keep Fort Peck Lake levels steady during the test?

Operational precedent
Will the mini test set the stage for the full test and future operational changes?

Hydropower impacts
What are the hydropower costs of the test?

Drought
Will the test be conducted if we are in a drought?

Discharge volume
Keep the discharge less than 12,000 cfs.

Discharges of 9.000 are just right; at 13,000, the banks start to move.

Scientific basis

How can a spring rise with clear water benefit the pallid sturgeon when historically these spring rises were very turbid?

It's more efficient and avoids erosion damage to raise pallid sturgeon in a hatchery.

There was a request that an independent group (e.g. not the USFWS) do the monitoring.

Mosquito control

Would the increased water impact vector (mosquito) control efforts in Williston?

Flooding

There is concern that any increase in water would increase the risk of farmland flooding along the river.

Would the increased flows flood lowland sugarbeet fields?

Cottonwood Forest

Would the mini test affect cottonwood forests?

Paddlefish

Would the warm water from the mini test cause paddlefish to leave the Yellowstone River and move into the Missouri River?

Reservoir Fish

Would the mini test result in lake fish being spilled into the river along with the spillway discharge?

Comments on the Draft Environmental Assessment (EA)

The Draft EA for the Fort Peck Mini Test was released for comment on April 8, 2002, with an initial comment closing date of May 10, 2002. The Corps sent out a letter to the mailing list dated May 8, 2002 extending the comment period until August 9, 2002. An errata sheet containing omitted economic information was also included in this letter.

Three press releases that were issued by the Corps related to the Draft EA are:

- an initial press release announcing the availability of the Draft EA for review and comment
- a second press release dated May 3, 2002 announcing the extension of the comment period
- a third press release reminding people of the upcoming comment period closing date

Written comments on the Draft EA were received from six agencies, three public groups, and 330 private citizens (including several comments received after the August 9 comment closing date). No written comments on the Draft EA were received from any municipalities or Tribes.

Most of the citizen letters were "form" letters consisting of four basic types. An example of each form letter can be found in Appendix M, as well as copies of each non-form comment letter received. Corps responses to the comments can also be found in Appendix M. The comments did not result in any substantial changes to the text of the final EA; however, the content of the Errata sheet has been added into the EA text. The final EA also includes updated information from pre-test monitoring and information from the Biological Opinion Amendment and the Master Manual.

Agency Comments

The following agencies sent written comments on the Draft EA:

- State of Missouri Department of Natural Resources
- North Dakota State Water Commission
- Montana Fish, Wildlife, and Parks (two letters)
- Montana Department of Natural Resources and Conservation
- Richland County
- McCone County

Agency letters can be found in Appendix M. Primary issues raised in the letters are as follows:

- Disagree with erosion analysis (North Dakota Water Commission)
- Food habits study not adequate to prove that sturgeon are NOT being eaten (State of Missouri)

- Supports mini test and monitoring plan; concerned about fishing access on school trust land (a separate project) conflicting with pallid sturgeon goals (Montana Fish, Wildlife, Parks)
- The discharge of water could be detrimental to farmers, ranchers, and taxpayers; loss of land due to erosion and flooding could be costly to the county (Richland County)
- Questions the need for the tests and scientific basis for tests; lack of compensation plan; concern about spread of noxious weeds; compensation for higher electricity costs (McCone County)
- Provide adequate safety warnings; elaborate on stop protocol; low lake levels; impacts to trout fishery below dam (Montana Department of Natural Resources)

Public Group Comments

Written comments on the Draft EA were received from the following groups:

- Burleigh, Oliver, McLean, Mercer, Morton (BOMMM) County Water Resources Districts Joint Water Resource Board
- Missouri Levee & Drainage District
- McCone Conservation District

Copies of these written comments can be found in Appendix M. Primary issues raised in these comments are as follows:

- Concerned about non-native fish preying on the pallid sturgeon (Missouri Levee and Drainage District)
- Disagrees with erosion analysis (BOMMM Board)
- Want a plan to protect pump sites, electric costs, erosion may cause influx of noxious weeds (McCone District)

Public Comments

The Corps received 326 written comments from the public. A sample of each of the form letters received can be found in Appendix M, as well as a copy of each original (not form) letter received on the Draft EA. Although the vast majority of comments were from Montana and North Dakota, comments were also received from Minnesota, California, and Idaho. Primary issues raised in these comments are as follows:

- extend comment period 90 days
- requesting that an EIS be done and full economic analysis
- increase discussions of landowner rights, mineral rights, and water rights
- include a plan for compensation, mitigation, repair, or replacement of agriculture-related operations if damage is incurred
- include a plan to handle increased silt deposit and related flood risks

- more consideration should be given to propagating the pallid in a hatchery instead of flow modifications
- lowering of the water level in Lake Peck will affect walleye and other lake species
- consistency with the Montana Stream Bank Preservation Act of 1975
- keep Montana's water in Montana, especially during the summer
- don't think cold lake water will raise river temps
- concerned about flooding birds for pallid support flows
- use money ear-marked for tests to support the Fort Peck fish hatchery instead
- specify stop protocol flows (e.g., for Yellowstone); environmental bias

II. Purpose of and Need for the Mini Test

This section is separated into three parts that discuss various aspects of the purpose and need for the mini test. The first section discusses the "underlying purpose" of the test, which describes the relationship among this mini test and other Corps actions (and potential actions) of a similar nature at Fort Peck Dam. The second section discusses the specific purpose for the mini test, its objectives, and desired data outcomes as a "stand alone" project. The third section discusses the need for the mini test from a NEPA perspective.

Underlying Purpose for Flow Tests at Fort Peck

The underlying purpose for the Fort Peck flow tests is to support the Endangered Species Act and the Fort Peck pallid sturgeon flow tasks found within the Opinion. The mini test and full test at Fort Peck Dam are included as part of the "Reasonable and Prudent Alternative" to alleviate jeopardy to the pallid sturgeon (USFWS 2000). The potential for permanent flow modifications at Fort Peck Dam is unknown at this time until data from the tests are available for review. Pertinent parts of the Opinion can be found in Appendix B.

Flow changes out of Fort Peck Dam were first suggested during the 1997-98 Annual Operating Plan (AOP) process. The Missouri River Natural Resources Committee[12] (MRNRC) included the following paragraph in its comment letter on the draft AOP (letter dated September 5, 1997):

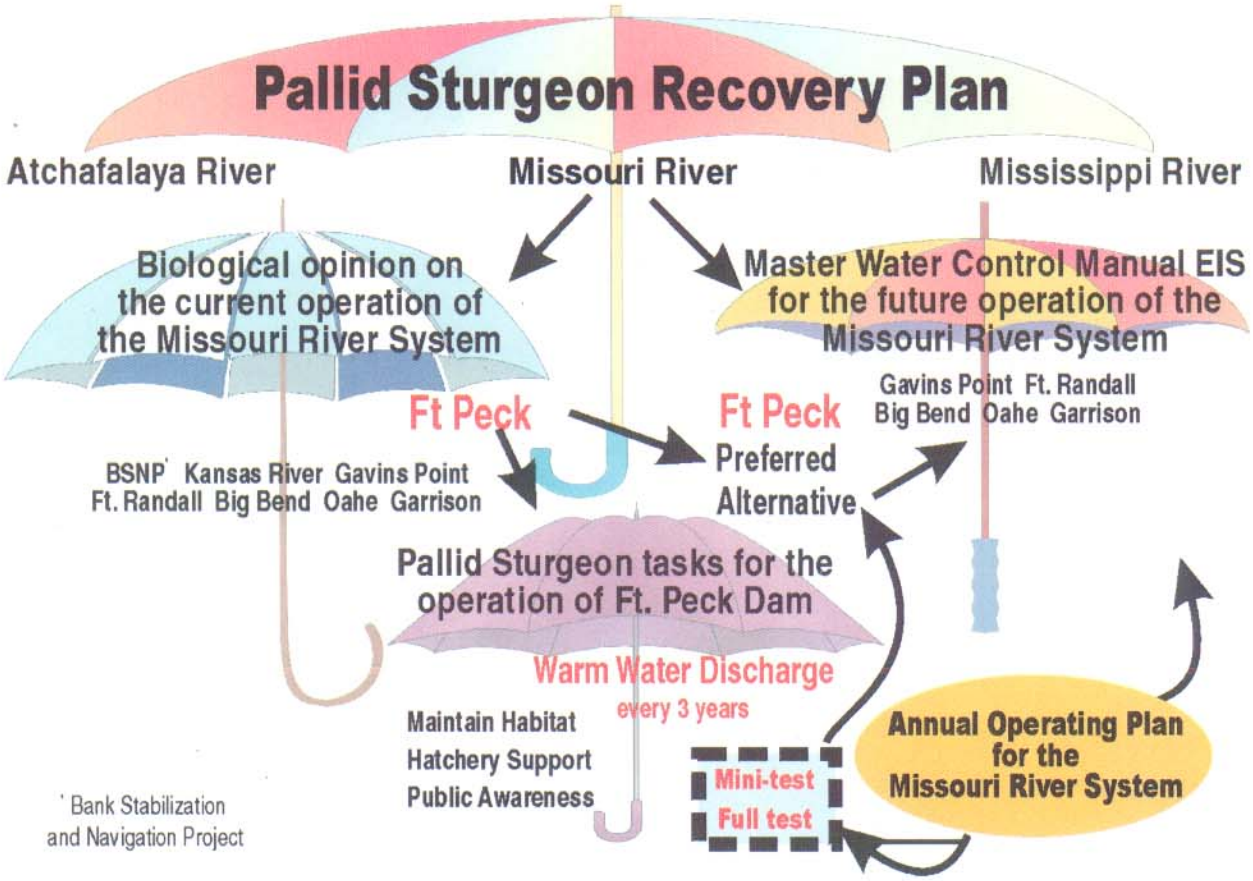
> For runoff projections between median and upper quartile, operations for Fort Peck should be as follows: between May 15 and June 15 releases from Fort Peck should be 25 kcfs with approximately 50 percent of these flows originating through the traditional power plant and the remaining 50 percent from the spillway. The purpose for this release is two-fold. First, field personnel will monitor movements of native fish in relationship to flows. Secondly, habitat changes due to a month of relatively high flows will be documented. Further justification and reasoning for this release scenario was established last year by the Montana-North Dakota pallid sturgeon work group (refer to the Chris Hunter letter to Col. Richard Craig dated February 13, 1997, Appendix B).

Similar comments have been received from the MRNRC through the AOP process annually since 1997. Other agencies or groups with flow recommendations below Fort Peck Dam include the Missouri River Basin Association[13] (MRBA) and the USFWS. These comments can also be found in Appendix B.

[12] The MRNRC is a group composed of representatives from each Missouri River basin state.
[13] The MRBA is a group composed of state water resource agency appointees from each Missouri River basin state.

The purpose of the tests (mini test and full test) is to gain information on the relationships among discharge volume, resulting river temperatures, and pallid sturgeon spawning behavior. These tests may determine if operational changes could benefit pallid sturgeon. The tests would also result in data that could address spillway integrity and other issues.

Figure 2. Relationship Among Related Missouri River Actions



The figure above illustrates the relationship among the mini test (in the dashed box) and other related actions. The mini test is one of the recommended pallid sturgeon tasks for Fort Peck Dam (purple umbrella), which fall under the Biological Opinion (blue and white umbrella), which ultimately fall under the Pallid Sturgeon Recovery Plan. The mini test is also related to potential future flow alternatives from Fort Peck Dam, if supported by the data, as well as the draft and final revised Master Water Control Manual (pink and yellow umbrella), as well as the Annual Operation Plans for the Missouri River main stem system (gold oval).

The specific purposes of the mini test and full test are not identical and are being addressed separately. Each test has separate utility beyond its relationship to the other test.

Specific Purpose of the Mini Test

The purpose and objectives of the mini test are as follows:

- To test the long-term integrity of the spillway operating at higher flows
- To test data collection methodology to be used during the mini test and full test
- To gather data on temperature, based on various combined flows from the spillway and the powerhouse

The proposed flows during the mini test are not expected to be high enough to result in any significant pallid sturgeon benefits. However, the pallid sturgeon monitoring plan, developed for use during the full test, would be tested and standardized during the mini test.

The mini test, as described in the Opinion, is to take place during a four-week period between May 15 and July 1 during the first year that reservoir elevation and runoff criteria can be met. A June 1 start date is tentatively planned, since a June start date increases the likelihood that the reservoir water would be warm enough to increase the Missouri River water temperatures.

The mini test was originally planned for a June 2001. However, runoff as low as 33 percent of normal in June 2001 resulted in a pool elevation 2.5 feet below the spillway crest; consequently the mini test was not conducted. A press release initially notified the public, agencies, and Tribes of the delay. AOP meetings throughout the Missouri River basin during the spring and fall further addressed questions on the timing for the mini test. Water elevations have remained low due to drought conditions, so the mini test was not conducted during June 2002 or June 2003, and is not expected to be conducted until June 2005 at the earliest.

The Need for the Mini Test

The mini test is needed to collect data on the status of the Fort Peck Dam spillway. This data could be used to update existing models and better refine future operation and maintenance needs for the spillway. Additionally, the temperature data collected could be used to more accurately model downstream temperatures under various combinations of dam discharge and spillway discharge to best meet the target temperature of 18 degrees C (64.4 degrees F) at Frazier Rapids (approximately 25 miles downstream from the powerhouse) as stated in the Opinion.

During scoping meetings for the mini test (and the full test), as well as in some of the written comments received during the scoping process, the need for the mini test (and full test, and potential future operational changes) was questioned. The public questioned the scientific basis for the test, as well as the stated causes for the decline of the pallid sturgeon.

Scientific Basis*

The need for the mini test (and the underlying need for the mini test, full test, and potential future operational changes) is discussed in detail in the Opinion, which is hereby incorporated by reference to avoid unnecessary redundancy. Pertinent parts of the Opinion (those specifically relating to the Fort Peck tests), as well as a clarifying letter from the USFWS, are included in Appendix B. The mini test (and full test) were also included in the December, 2003 Biological Opinion Amendment.

The mini test and full test have been included as part of the Corps Proposed Action (PA) in its July, 2003 Biological Assessment to avoid jeopardizing threatened and endangered species and adversely modifying critical habitat. The data collected from these tests could be used in an adaptive management framework to determine if future tests, or future potential flow modifications, are warranted.

The Corps intends to implement those tasks withn the Opinion which are reasonable and prudent, in coordination with the USFWS, which is the agency with primary expertise with regard to the needs of endangered species. Any further explanation of the scientific basis for this test is outside the scope of this EA.

* An issue raised during public scoping

III. Description of the Proposed Test

The proposed mini test components are identified as follows, all of which in combination constitute the proposed mini test. Several of the components (indicated by asterisk*) were included to address issues raised as a result of scoping meetings and written comments during the NEPA process[14]. Other components (indicated by double asterisks**) are monitoring components that were already included in the test proposal.

- Test various combinations of spillway and powerhouse flows with periodic data collection periods of 4 to 12 hours
- Combined spillway and powerhouse flows not to exceed total of 15,000 cfs
- Release a minimum of 4,000 cfs through powerhouse to support coldwater fishery
- Set spillway discharges ranging from 0 to 11,000 cfs
- Minimum combined flows (spillway plus powerhouse) would remain above 8,000 cfs in order to address irrigation concerns*
- Fish nets or other deterrents may be used to prevent fish movement over the spillway during the test, except for one experimental test discharge*
- Low lake elevations or projections of less than "upper quartile" inflows may cause modification or postponement of the mini test*
- Data Collection includes:
  - temperature data in the reservoir and river**
  - fisheries data**
  - spillway integrity data**
  - depth and shape of scour holes**
  - erosion rate at a sample of downstream sites**
  - inventory of potential cultural resources sites and traditional cultural properties**
  - monitoring of water quality, primarily turbidity, around water intake sites*
- "Stop" protocol as determined by the Missouri River Basin Water Management Division
  - spillway slab movement
  - life in danger
  - Missouri River flow out of banks
  - major loss of historical remains[15]
  - energy shortage

[14] The "NEPA process" refers to the National Environmental Policy Act (1978) that requires the federal agency to fully disclose the proposed federal action and its impacts to the public and agencies. This process includes a "scoping" process during which the federal agency requests information from the public, agencies, and Tribes in order to better determine impacts and benefits associated with the proposed project.

[15] based on criteria to be developed through ongoing consultation between the Tribes and the Corps

General Release Adjustment Guidelines

For the purpose of blending flows and altering Missouri River water temperature, the flow test scenarios would require a series of combinations of powerhouse and spillway releases. Local interests indicated that a fluctuating river elevation wreaks havoc with irrigation intakes. Therefore, each change in flow releases would be phased such that the total flow remains roughly the same. As the spillway release is altered (raised or lowered), a corresponding change in the power release would be required to maintain a constant combined flow total. Reductions in spillway releases would make it difficult to maintain the desired temperatures downstream

Strategy for Changing to a New Flow

The spillway exit channel enters the Missouri River at an angle that could direct flows toward the opposite, or left, bank. To minimize the spillway release impact on the left bank, power tunnel releases would be used to provide a backwater effect. When the flow scenario causes an increase in the combined total flow, the increase would first be accomplished with the power tunnel to the extent practical. After the river was stabilized, power tunnel flows would be reduced while spillway flows are increased.

Constant Flow Period

Constant flows from both the spillway and power tunnel would be required for data collection for the duration of each flow combination. Severe winds or extreme inflows could affect the pool elevation enough that the spillway release could vary during the test. Spillway flow measuring equipment would be monitored during the test. If the monitoring equipment indicates a spillway flow change greater than 500 cfs, adjustments to the spillway gate setting would be performed. No adjustment to power tunnel release would be expected during the constant flow period. Power plant peaking or variation from a constant flow would not be allowed during the test flow test period. If unforeseen power plant flow variation occurs, the test period would be lengthened accordingly.

Pool Elevation Requirements

Annual Operating Plan simulations indicate that Upper Quartile or greater runoff would be needed in 2004 to raise Fort Peck Lake to an elevation sufficient for spillway releases. The Fort Peck spillway rating curve indicates that a pool elevation of 3.5 to 4 feet above the gate crest elevation of 2,225 feet msl is required for a spillway discharge of 11,000 cfs. However, for conditions of pool depth less than 5 feet, meeting the test flow rate for the entire test duration may be difficult, possibly resulting in a shortened test. In addition, our release would fluctuate with the pool level since it wouldn't be regulated by the gate. Wind effects could be substantial and cause flow variation and test day analysis problems. **Therefore, at least 5 feet of lake elevation above the gates (2230+ feet msl) would be needed to run the mini test in order to maintain uniform discharges and minimize data analysis problems.** Hydraulic head elevation losses within the

upstream approach channel and through the gate structure would impact the required pool elevation. Spillway monitoring equipment would include flow measurement capability. Factors that impact the spillway rating curve (e.g., wind setup, hydraulic losses, etc.) would be evaluated during testing.

"Stop Protocol" to Avoid or Minimize Impacts

The operational "stop protocol" for the mini test, or the criteria under which the Corps would stop the test (once the test has begun) are as follows:

- Spillway slab movement or excess erosion of spillway banks
- Danger of loss of life
- Missouri River flow exceeding capacity of banks
- Major loss or potential loss of historical remains
- An energy shortage within the region

Normal erosion rates are expected to continue during the mini test. Also, no significant cultural sites have been identified adjacent to the bank of the river. Areas of concern would be monitored weekly during the test, however, to verify the condition of cultural sites.

Data Collection

The collection methodology proposed in the Fort Peck data collection plan has been tested and is in the process of being standardized using data collected during the summers of 2001 - 2004, as well as the data that would be collected during subsequent "pre-test" years, as well as during the mini test itself. The primary data collected during the mini test would be physical data (spillway stress data, temperature data, turbidity data, etc). The Fort Peck data collection plan (Appendix F) is designed to evaluate the biological response of pallid sturgeon and other native fish species to modified dam operations anticipated during the full test. This data collection plan augments the existing Western Area Power Administration's (WAPA)-sponsored data collection efforts in this reach.

Annual reports from data collected during 2001 and 2002 are included in Appendix L.

Table 2. Mini Test Flow Scenarios

Duration (days)	Spillway Flow (1000 cfs)	Power Tunnel (1000 cfs)	Combine Flow Total (1000 cfs)
Adjustment: Initial power flow at 8K, reduce to 4K while increasing spillway flow from 0 to 4K.			
4	4	4	8
Adjustment: Increase power flow from 4 to 8K while reducing spillway flow from 4 to 0K.			
1[1]	0[1]	8	8
Adjustment: Increase power flow from 8 to 11K. Reduce power flow from 11 to 7K while increasing spillway flow from 0 to 4K.			
4	4	7	11
Adjustment: Increase power flow from 7 to 14K while reducing spillway flow from 4 to 0K.			
4	0	14[2]	14[2]
Adjustment: Reduce power flow from 14 to 11K while increasing spillway flow from 0 to 4K.			
4	4	11	15
Adjustment: Reduce power flow from 11 to 7K while increasing spillway flow from 4 to 8K (maintain a maximum total of 15K). Further reduce power flow from 7 to 4K.			
4	8	4	12
Adjustment: Increase power flow from 4 to 7K.			
4	8	7	15
Adjustment: Reduce power flow from 7 to 4K while increasing spillway flow from 8 to 11K (maintain a maximum total of 15K).			
4[3]	11	4	15
1[4]	11 (no fish barrier)	4	15
Adjustment: Day 1- Reduce spillway flow from 11 to 5K while increasing power flow from 4 to 7K. Day 2 - Reduce spillway flow from 5 to 0K while increasing power flow from 7 to 9K. Day 3 - Further reduce power flow from 9K to the desired flow (7 or 8K).			
NA	0[1]	Normal	Normal

1. Monitoring Period. Spillway flow will be stopped during a 4-12 hour period to perform scour hole and exit channel surveys. The monitoring is scheduled to start at approximately 0830 after the listed spillway flows are stopped. After completion of monitoring, the spillway and power flows will be adjusted to the next flow combination.
2. Approximate power flow will vary depending upon pool elevation.
3. Flow combination duration may vary from 4-9 days depending upon monitoring results.
4. Flow combination duration as required may vary to provide data without the fish barrier.

IV. Alternatives

Alternatives Considered but Rejected

Alternative actions to achieve the three objectives described for the mini test were considered in preliminary discussions with regard to flow modifications out of Fort Peck Dam. Alternatives are described below, by mini test objective.

Objective - To test the long-term integrity of the spillway operating at higher flows

Alternatives - The only other method to determine spillway integrity is through modeling. As part of the Fort Peck Dam Major Rehabilitation Spillway Report, spillway stress was modeled. Additional modeling using existing data would not add to the knowledge of the spillway stability. New data is needed and could be provided by stress monitors during a spillway discharge event. With additional data, the model could be updated to provide a more accurate estimate of the spillway integrity situation.

Objective - To test data collection methodology to be used during the mini test and the full test

Alternatives - Although the methodology to collect most of the fisheries and water quality data is standard, there are some "on site" adjustments that are needed for this reach of the Missouri River. Additionally, this is the first time that remote telemetry receiving stations will be used in this reach; therefore, field-testing is prudent prior to using this equipment to determine pallid sturgeon response during the full test. There is no alternative to field-testing, other than to not test.

Objective - To gather data on temperature, based on various combined flows from the spillway and powerhouse

Alternatives - Although some temperature data are available for the Missouri River below Fort Peck, as well as for Fort Peck Lake and Fort Peck Dam discharge water, the relationship among the reservoir temperature, spillway discharges, and resulting river temperatures is unknown. The USFWS has identified 18 degrees Celsius (64.4 degrees Fahrenheit) as a target at Frasier Rapids (USFWS 2000); however, it is unknown whether this temperature is attainable using the spillway as a discharge vehicle for the warmer water of the upper lake. By collecting temperature information for a series of flows during the spillway stress tests, a model could be developed based on the relationship among the lake temperature, spillway discharge volume, powerhouse discharge volume, and the resultant river temperature at Frasier Rapids. This model may be able to further define the relationship among spillway flow volume and powerhouse discharges and resulting temperature conditions downstream. There is no alternative to collecting the temperature data other than to model the situation without the availability of true temperature data for model calibration.

Alternatives Outside the Scope of the Mini Test

There may be alternative actions (other than a spillway discharge) that could be taken to achieve the underlying purpose of the test ("..to support the Endangered Species Act and the Biological Opinion....to achieve 64.4 degrees F at Frazier Rapids ....to facilitate pallid sturgeon spawning..."). Warm water releases may also be potentially achieved by holding water in constructed shallow ponds for later release, running water through a heating component prior to discharge from the powerhouse, relaxing restrictions on warm-water effluent discharges along this reach, etc. However, none of these actions could achieve the specific purpose of the mini test, which is to test the spillway integrity, test data collection methodology, and to test various combinations of spillway and powerhouse releases. Therefore, these alternatives are not considered within this EA.

No Action Alternative

The Council on Environmental Quality (CEQ) requires that a "no action" alternative be included within a NEPA document. If the Federal action (mini test) is not pursued, then this "no action" alternative would consist of a continuation of the previous pattern of discharges from Fort Peck Dam. These discharges relate to precipitation and water availability, as well as hydropower demands, and would not be discharged for test purposes. The "no action" alternative would not meet the purpose and need for the mini test, would not result in the collection of spillway stability data, the testing of data collection methodology, nor the collection of temperature information about the various combinations of spillway and powerhouse releases.

V. Existing Conditions

This section describes the current conditions within the project area and its immediate vicinity. The current conditions may also include information on "normal" variability among water years (low flow, high flow, etc.). Physical and biological parameters that are discussed in this EA reflect the comments of the public, agencies, and Tribes that were collected during scoping. Those resources not impacted as a result of the mini test and not raised as scoping concerns are not included in this evaluation.

Environmental Baseline and Existing Conditions

Water Quality*

Temperature

Lake Temperatures

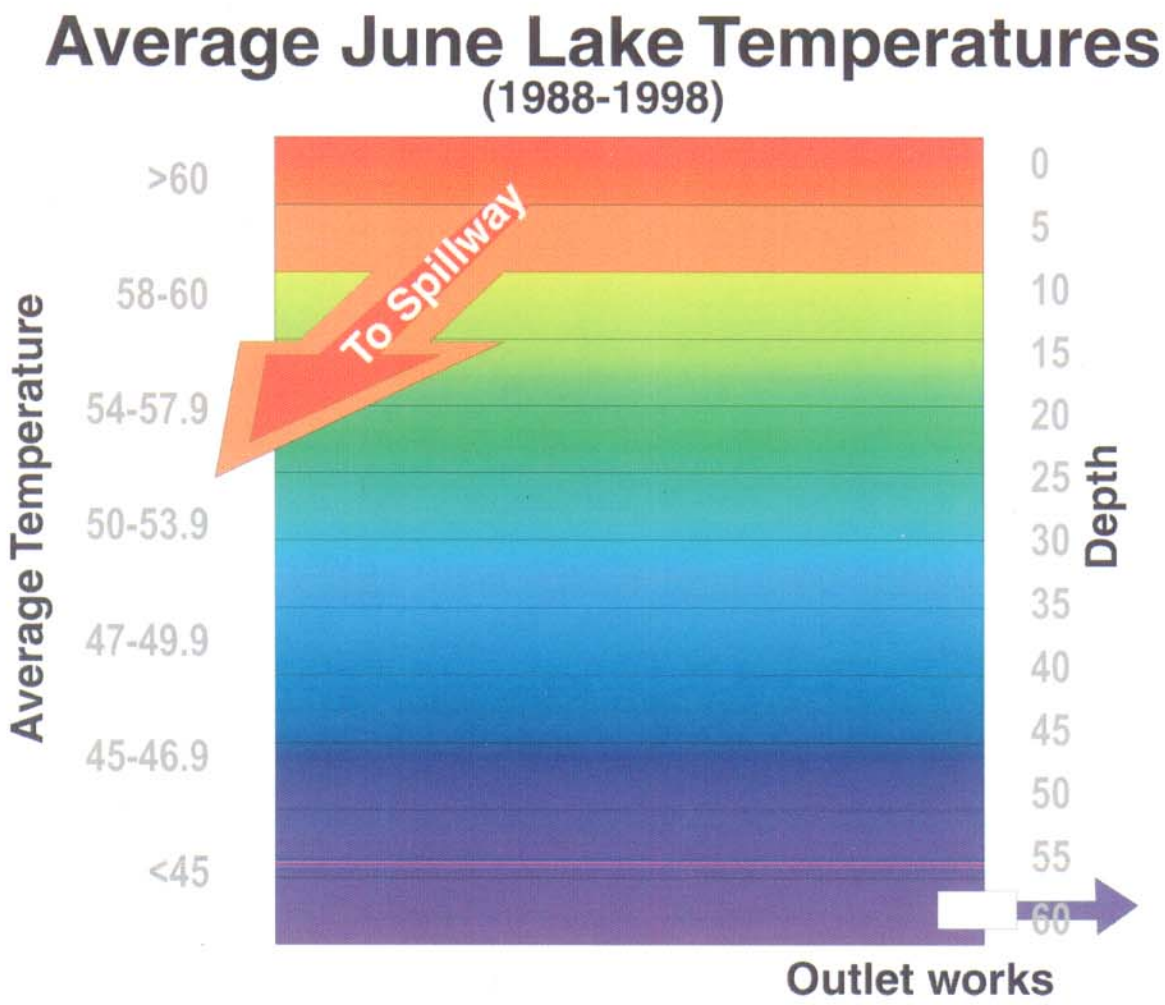
The water temperature in Fort Peck Lake varies from month to month, from year to year, and from the top of the lake to the bottom of the lake. Temperatures on the bottom of the lake are the same as the temperatures discharged from the outlet works, since the inlet pipe to the powerhouse is located near the bottom of the lake.

The intent of the mini test (and other flow modification actions) is to draw warmer water from the top of the lake down the spillway and into the Missouri River. The water from the upper tenth of a meter (about 4 inches) of the lake ranged from 71.6 (June 18, 1986) to 50.4 (June 7, 1982) degrees F during the month of June, based on monthly lake temperature measurements taken from 1976 to 1998. Since water would be drawn from 5 feet above the spillway gates and the relationship between the lake surface elevation varies by water year, the temperature range from a depth of 5 meters (about 15 feet) was used for temperature analysis. The historic temperature range for the upper 15 feet ranged from 68 to 55 degrees F during the month of June. The warmer the water discharged down the spillway, the greater the likelihood for temperature changes in the Missouri River resulting from the mini test.

By contrast, the water 55 meters (about 165 feet) below the surface of the lake ranged from 42.8 to 50.0 degrees F during the month of June. The average lake temperatures from 1988 to 1998 are graphed by depth in Figure 3. Depth for the figure is in meters.

* An issue raised during public scoping

Figure 3. Average June Lake Temperatures



Temperature of Water Discharged from Dam

The powerhouse inlet pipe is located near the bottom of Fort Peck Dam, and therefore water discharged from the powerhouse comes from the hypolimnion, or bottom, of the lake. This water is almost always the coldest water available from the lake. Water temperatures were taken for water in the tailrace immediately below the dam, which is where the water is discharged from the powerhouse. Tailwater temperatures during the month of June (1990 - 1997) ranged from 44.6 - 53.8 degrees F (U.S. Army Corps of Engineers, unpublished data).

Table 3. Tailwater Temperature Data, 1990 to 1997

Month	Minimum	25th percentile	Median	75th percentile	Maximum	Observations
January	33.9	35.0	35.6	36.6	42.9	170
February	34.8	35.1	35.3	36.5	38.0	147
March	35.0	35.6	36.2	36.9	43.7	166
April	35.9	37.3	38.2	39.9	47.1	125
May	39.5	42.4	44.0	46.2	54.1	111
June	**44.6**	**46.5**	**48.2**	**50.7**	**53.8**	**114**
July	46.5	47.9	49.9	52.2	57.9	88
August	47.5	51.3	52.9	56.1	59.7	127
September	50.8	53.0	54.3	57.5	71.2	106
October	50.7	54.2	55.5	57.3	64.8	125
November	38.4	45.1	46.9	49.2	53.1	150
December	34.4	37.0	39.1	41.2	44.2	168

Missouri River Temperatures

As the water from the tailrace moves downstream, it is warmed by solar radiation, atmosphere interaction, wind action, and incoming warmer tributaries. The intent of the mini test is to see how the introduction of warmer lake water, via the spillway, affects the Missouri River temperatures downstream. Average daily Missouri River temperatures, based on data collected during June 2001, ranged from 49.6 to 75.9 degrees F, and increased as one progressed downstream (Yerk and Baxter, 2001).

Hypolimnetic releases (coming from the bottom of the lake) through Fort Peck Dam have altered the water temperature regime of the Missouri River downstream from Fort Peck Dam based on a comparison with the Missouri River above Fort Peck Lake. Gardner and Stewart (1987) found that average temperatures (in degrees F) between June and September were 66.9[16] in the Missouri River above Fort Peck Lake, 52.5 downstream from the Fort Peck Dam, and 58.8 at Wolf Point, and 61 near Culbertson. Thus, mean water temperatures are suppressed 5.9 to 14.4 degrees F compared to conditions upstream from Lake Peck.

During 2001, mean water temperature between mid-May and mid-October was 6.3 degrees C cooler at Frazer Rapids (mean = 13.8 degrees C) than in the free-flowing Missouri River upstream from Fort Peck Dam (mean = 20.1 degrees C) (Braaten and Fuller, 2002). Temperatures at Frazer Rapids, the targeted area for 18 degree C in the 2000 Biological Opinion, did not reach 18 degrees even during late summer months, according to temperature data collected during 2001 and 2002.

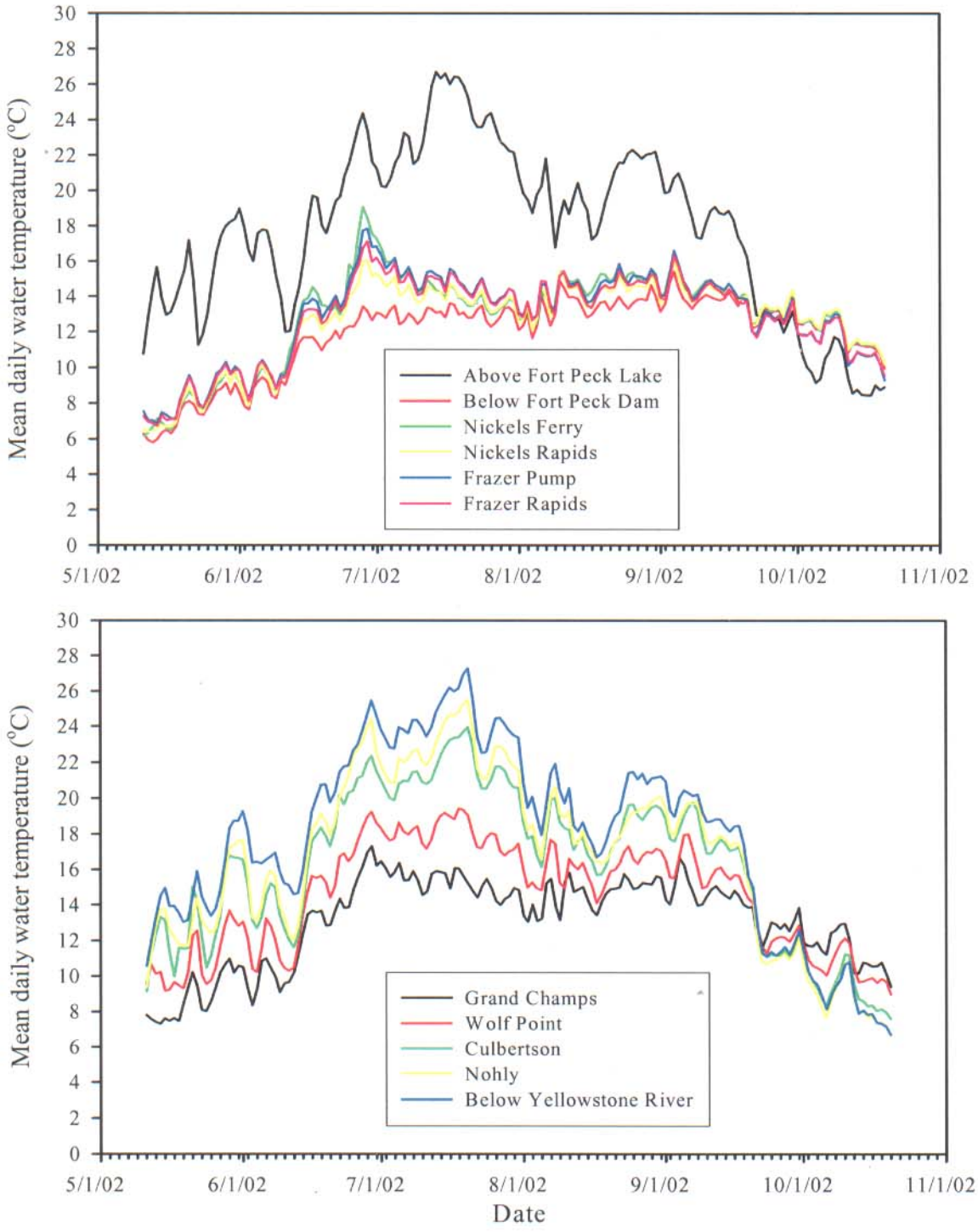
The Opinion states that a minimum water temperature of 18 degrees C (64.4 degrees F) will be established at Frazer Rapids (river mile 1746) via spillway releases. According to the Opinion, pallid sturgeon spawning is thought to occur as water temperatures approach 18 degrees C. The existing temperature in the Missouri River at Frazier Rapids during

[16] Gardner and Stewart reported results in degrees C which have been converted to degrees F for understandability in the EA using the formula F = 1.8 (degrees C) + 32.

the month of June, based on data collected during 2001, ranged from 49.7 (June 14, right bank) to 63.6 (June 29, left bank) degrees F. The temperature varies from right bank to left bank, and from the surface to the bottom within the water column, with an average June water temperature in 2000 and 2001 of 55.5 degrees F (Yerk, 2001 and Braaten, 2001). Maximum daily temperatures at the Frazier Rapids site targeted for temperature increases averaged 17.0 degrees to 17.1 degrees C from 2000 - 2002 data collection efforts (Yerk and Baxter 2000, Braaten and Fuller 2002, Braaten and Fuller 2003).

During 2002, mean daily water temperatures for the Missouri River mainstem sites was greatest at the Robinson Bridge site (17.9 degrees C) located above Fort Peck Lake, and in the Missouri River downstream from the Yellowstone River (17.9 degrees C). Just below Fort Peck dam, temperatures averaged 11.9 degrees C. As shown on Table 4 below, throughout the summer water temperatures increased as water moved downstream to 16.7 degrees at the Nohly site and were highest below the Yellowstone confluence (Braaten and Fuller, 2003).

Table 4 - Mean Daily Water Temperatures 2002
(Braaten and Fuller, 2003)



Turbidity

Fort Peck Tailwaters

Turbidity data was collected by the Corps in the tailwaters of Fort Peck Dam during the period 1990 through 2001. During this period, turbidity was monitored sporadically during the months of February through October. A summary of this information is given below.

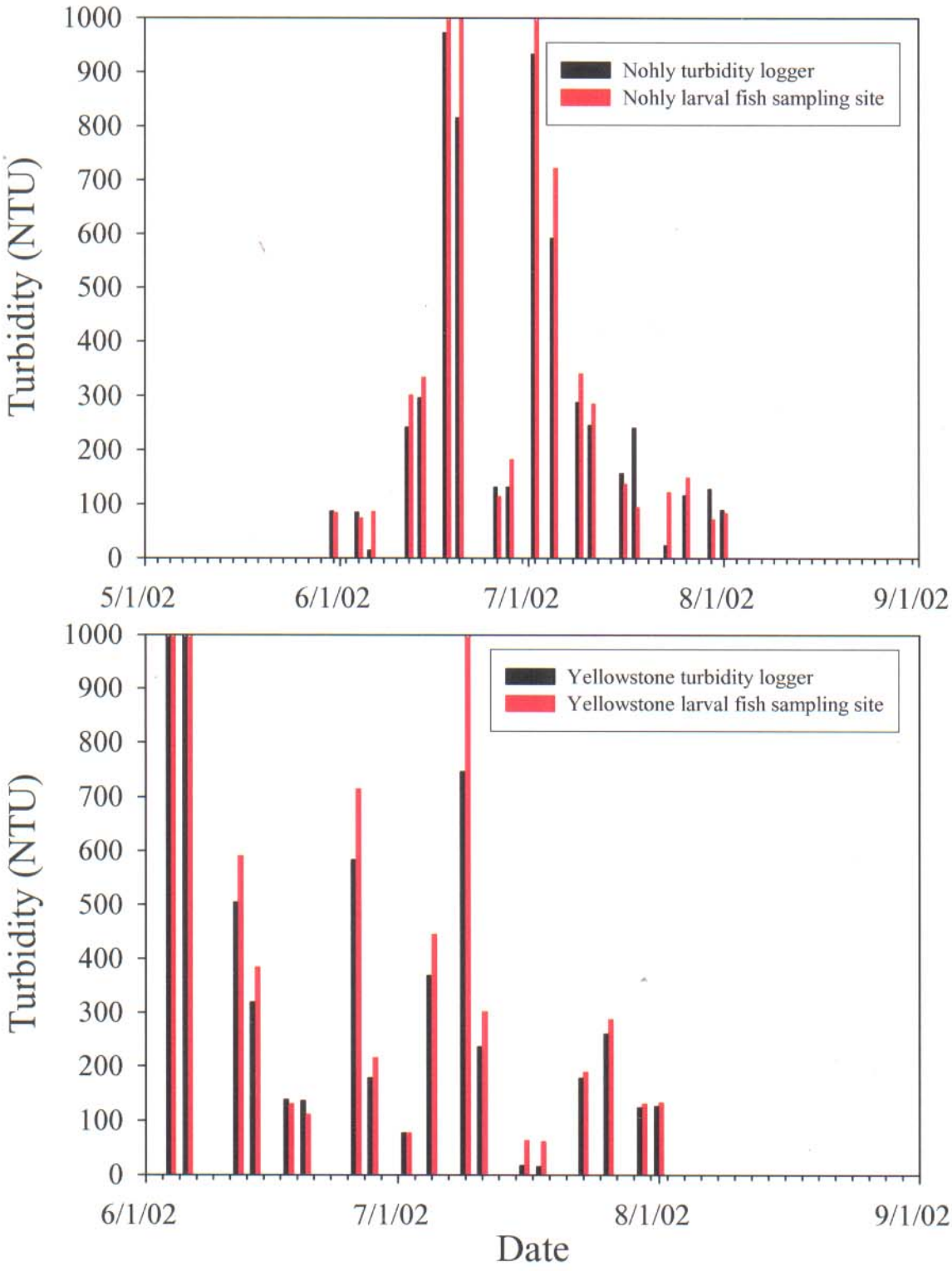
Turbidity is an important water quality variable that can influence the distribution and habitat use of pallid sturgeon. There is evidence suggesting that pallid sturgeon prefer areas of high turbidity in the Missouri River (Erickson 1992). In addition to altered discharge and reduced water temperatures, the reduced turbidity in the Missouri River downstream from Fort Peck Dam (Dieterman et al. 1996; Young et al. 1997) may inhibit use of this area by pallid sturgeon.

Missouri River Turbidity

The relatively clear water coming out of the powerhouse and into the tailwaters quickly picks up sediments as it moves downstream. Tributaries add considerable amounts of turbidity, as does rainfall runoff. During monitoring during 2001 and 2002, turbidity increased longitudinally downstream from Fort Peck Dam and generally increased during periods of elevated discharge (Braaten and Fuller, 2002; Braaten and Fuller, 2003). The ability of the water to suspend sediments is related to water temperature; warmer water can hold more sediment than cooler water. Therefore, as water temperatures increase, the potential for increased turbidity in that water is slightly greater.

Table 5 shows the variation in turbidity throughout the season in the Missouri River and in the Yellowstone River. Turbidity was taken by remote logger (in black) and in conjunction with larval drift collections (Braaten and Fuller, 2003).

Table 5 - Mean Daily Turbidity 2002
(Braaten and Fuller, 2003)



Water Chemistry

Lake Water Chemistry

Fort Peck Lake is used as a water supply by the towns of Fort Peck and Glasgow, Montana, and for numerous individual cabins in the area. The State of Montana has placed Fort Peck Lake on the 303(d) List of Impaired Waterbodies due to the presence of lead, mercury, other metals, and noxious aquatic plants. Inflows and waters within Fort Peck Lake have a low pH and elevated levels of arsenic, phosphorus, mercury, manganese, beryllium, and iron (U.S. Army Corps of Engineers, 2001a). While generally considered "good," water quality, the Fort Peck Lake has occasionally exceeded Montana water quality standards and/or EPA criteria for arsenic, mercury, cadmium, and chlordane. These pollutants apparently derive from non-point sources and enter the reservoir through inflows or from local soils. The exceedances have not been large or frequent enough to constitute a problem for water users.

The Montana Department of Public Health and Human Services has published a "Meal Advisory" for the consumption of certain species and size of fish caught in Fort Peck Lake due to mercury in the tissues of walleye, northern pike, lake trout, and chinook salmon (Environmental Protection Agency, 2001).

During the 1987 and 1989, two instances of algal blooms resulting in the release of algal toxins occurred within Fort Peck Lake. Large algae blooms occur nearly every year, which is typical for aging lakes.

River Water Chemistry

There are two Missouri River segments downstream from Fort Peck Dam that are on the State of Montana's 303(d) List of Impaired Waterbodies; from Fort Peck Dam to the Poplar River, and from the Poplar River to the North Dakota border. These segments are affected by metals and habitat alteration resulting from modified stream flows (U.S. Army Corps of Engineers, 2001a).

Lake Levels*/Discharge Volume*

The average annual daily discharge from Fort Peck Dam is 10,000 cfs. The flow duration analysis from 1960 through 1999, using data from the "below Fort Peck gauge," indicates that June's daily flow is generally in the range from 14,400 to 14,800 cfs for the 90 percent flow. This means that 10 percent of the time, the average daily flow will be higher than that value. During the mini test, the average daily discharge will range from 8,000 cfs to 15,000 cfs. An average daily discharge of 15,000 cfs or higher occurs about every 20 years.

The 50 percent exceedance lake elevation for the month of June (1898 - 1997) is 2239.5 feet msl. That means that half of the years are above that value and half of the years are below that value.

Flooding*/Drought*

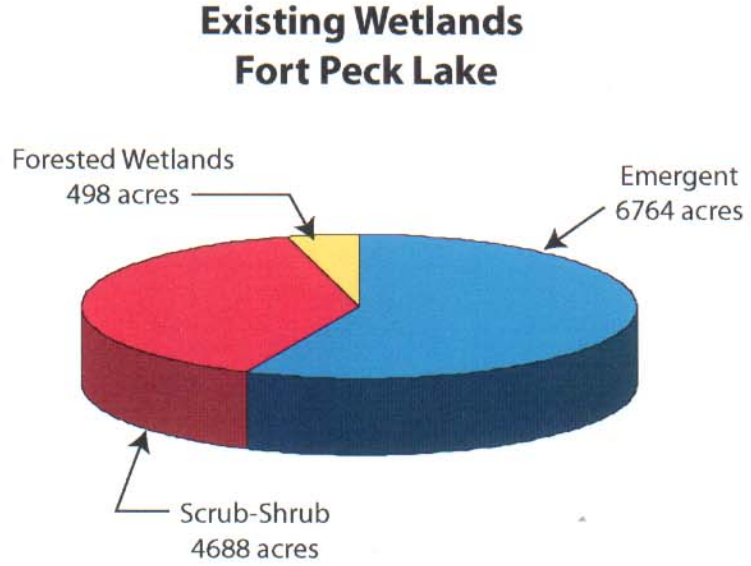
Downstream flooding was an issue raised by organizations and individuals during the scoping process. Concern was voiced regarding the flooding of valuable agricultural land near the headwaters of Lake Sakakawea and of low farm ground in general. The impact of the increased Missouri River flow in conjunction with seasonal high flows on the Yellowstone River were of special cencern. These are the result of mountain snowmelt and normally occur at the same time as the proposed mini test. This combination could impact landowners near the confluence of these rivers and downstream to Lake Sakakawea, especially flooding and an increased water table at the Buford-Trenton Irrigation District.

Wetlands

Fort Peck Lake Wetlands

Figure 4 depicts the relative acreage of wetlands by type along Fort Peck Lake. This information is based on National Wetland Inventory survey information, as summarized by the draft Master Manual (Corps of Engineers, 2001).

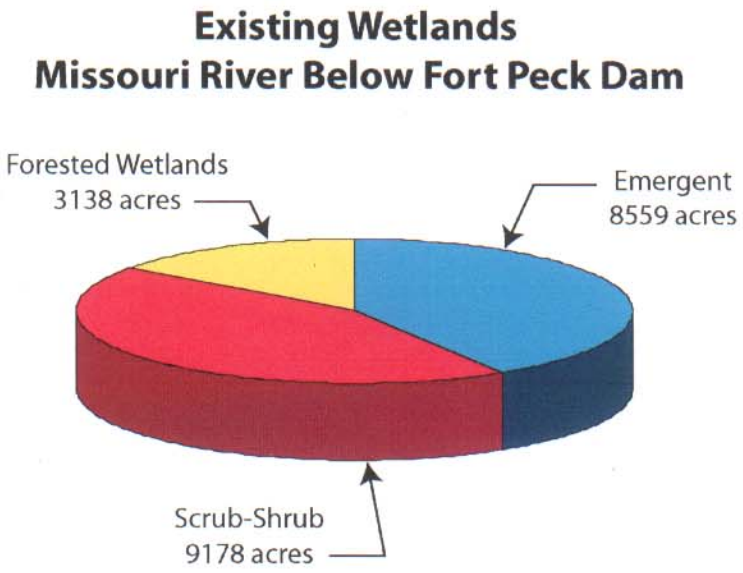
Figure 4. Fort Peck Wetlands Composition



Wetlands along the Missouri River below Fort Peck Dam

Figure 5 depicts the relative acreage of wetlands by type along the Missouri River below Fort Peck Dam. This information is based on National Wetland Inventory survey information, as summarized by the draft Master Manual (Corps of Engineers, 2001a).

Figure 5. Missouri River Wetlands Composition Below Fort Peck



Cottonwood Forest

Lake Cottonwood Habitat

The north side of the lake consists of gently rolling hills with upland vegetation, primarily mixed short-grass and mid-grass prairie. A large ponderosa pine forest is located on the east end of the lake. On the south side of the lake, vegetation consists of primarily pine forest in areas of rugged topography, as well as prairie and sagebrush on areas of level topography. Shrubs are concentrated in ravines and tributary valleys. The upstream end of the lake consists of deciduous floodplain forest. Much of the area is grazed by cattle which results in limited natural regeneration of tree seedlings. Tree plantings are regularly done by the Corps and the USFWS.

Riverine Cottonwood Habitat

The low elevation areas in the tailrace below the dam consists of deciduous floodplain forest. Higher elevation areas consist of prairie vegetation and sage on gently rolling topography. An inventory of cottonwood forest habitat was conducted by a contractor for the Fort Peck Tribes as part of riverbank monitoring for the mini test. Cottonwood

trees have cultural and religious importance to the Tribes. The scope of work for this effort can be found in Appendix D, as it is a sub-set of the cultural resources inventory.

The following information is from the cottonwood study conducted by Elliot and Larix, 2001. The riparian community along the Missouri River consists of an overstory dominated by cottonwoods (40 to 80 percent of canopy cover) ranging from 12 to 40 inches in diameter. Most of the mature trees have heart rot, complicating the determination of age, however it appears as though most of the trees are over 70 years old, and many are over 100 years old. The average life expectancy for the Great Plains cottonwood is 125 years. Cottonwood vigor is poor, evidenced by dead tops, missing branches, and cavities. Live trees ranged from 30 to 250 per acre. Dead trees ranged from 0 to 100 per acre. Cottonwood reproduction is taking place along a narrow zone along the river, and these trees are extremely vulnerable to beaver-caused mortality (although older trees also show beaver damage). The cottonwood study can be found in Appendix L.

Fisheries

Fort Peck Lake

Fort Peck Lake is noted for its walleye fishery. Supplemental stocking is needed to perpetuate the species since spawning habitat is limited due to the general lack of rocky substrates. The lake also has a significant coldwater fishery for lake trout and chinook salmon. Chinook salmon do not reproduce naturally and are, therefore, stocked annually. Lake trout were introduced into the lake by stocking; however, they now spawn on riprap along the face of the dam. Erosion due to wave action and water level fluctuation preclude vegetation growth around the perimeter of the lake and severely limits spawning and rearing habitat for other game species such as northern pike, crappie, and yellow perch. Observations by Water Management personnel in recent years as the pool has lowered indicate that the soil is so sterile that no vegetation, including weeds, grows along the shoreline (Keasling, personal communication). Pallid sturgeon and paddlefish have also been found in the lake and are probably remnant river populations. These species migrate upstream into the Missouri River upstream from Fort Peck Lake on a seasonal basis (U.S. Corps of Engineers, 2001a).

As mentioned in the Water Quality section, the Montana Department of Public Health and Human Services has published a "Meal Advisory" for the consumption of certain species and size of fish caught in Fort Peck Lake due to mercury in the tissues of walleye, northern pike, lake trout, and chinook salmon (Environmental Protection Agency, 2001).

Missouri River below Fort Peck Dam

The river immediately below Fort Peck Dam is cold and clear and has little cover. The nominal sediment load in this reach contributes to the availability of gravel substrate throughout the area. The outlet works for the dam releases cold water in a "tailrace" area that supports a large population of shovelnose sturgeon, some pallid sturgeon, and

rainbow trout. A lake-like "dredge cut" area also supports a paddlefish population (U.S. Army Corps of Engineers, 2001a). This section of the river is considered a coldwater fishery in Montana's state water quality regulations.

Downstream from the Milk River, the Missouri River warms and holds more sediment. The inflow from the Yellowstone River even further downstream adds sediment and nutrients to the reach. This segment of the Missouri River is considered a non-salmonid fishery.

During a 1999 study in which trammel nets were used to collect fish, 13 species were captured in the Missouri River:

pallid sturgeon	smallmouth buffalo
shovelnose sturgeon	bigmouth buffalo
paddlefish	longnose sucker
goldeye	white sucker
carp	channel catfish
river carpsucker	burbot
blue sucker	sauger
walleye	

The most numerous species captured during this study was the channel catfish, followed by the shovelnose sturgeon, and the sauger (Liebelt, 1999).

Movement of native fish species is of interest as it may relate to pallid sturgeon movement in response to flows. During 2001, 16 blue suckers, 19 paddlefish, and 29 shovelnose sturgeon were surgically implanted with radio/accoustic transmitters as part of baseline data collection efforts associated with the mini test. Movement of these fish was recorded, beginning in April 2002 to examine discharge and temperature-related movement patterns.

In 2002, additional fish were captured and implanted with monitoring transmitters: 21 shovelnose sturgeon, 21 blue suckers, and 3 paddlefish. An additional 20 paddlefish were captured and implanted by Dr. Dennis Scarnecchia from the University of Idaho. Permission has been granted to track movement information of these additional paddlefish as part of the Fort Peck telemetry project. Between April and November of 2002, telemetry relocations were obtained for 16 blue suckers (160 relocations), 27 shovelnose sturgeon (276 relocations), and 18 paddlefish (134 relocations) in the Missouri and Yellowstone Rivers (Braaten and Fuller, 2003). Shovelnose sturgeon and paddlefish were highly migratory and exhibited seasonal differences in the use of the Missouri River and the Yellowstone River. Blue suckers tended to be less migratory. See full report in Appendix L.

Threatened and Endangered Species

The following federally listed species could occur within the vicinity of the Fort Peck Dam, Corps' project areas, or downstream riverine habitat:

Black-footed ferret	Endangered	potential resident
Bald eagle	Threatened[17]	winter resident
Piping plover	Threatened	summer nesting migrant critical habitat proposed
Least tern	Endangered	summer nesting migrant
Pallid sturgeon	Endangered	resident

Black-footed Ferret

Black-footed ferrets have not been sighted on Corps' project lands. A 1967 survey indicated signs of ferrets in two prairie dog towns; however, no ferrets were observed. Due to their association with prairie dog colonies, occurrence of ferrets is possible, though unlikely. Over 100 prairie dog colonies cover about 5000 acres on project lands (USACE 1992b).

Bald Eagle

Bald eagles are common within the Fort Peck project area. An estimated 100 eagles may be present within the project vicinity on any given day during spring migration. Since 1988, eagles have been wintering in substantial numbers below Fort Peck Dam on the north edge of the Downstream Recreation Area. Eagles also winter on Scout Island, the shoreline of the Corps' group camp area, and trees on the east bank of the tailrace pool.

Piping Plover

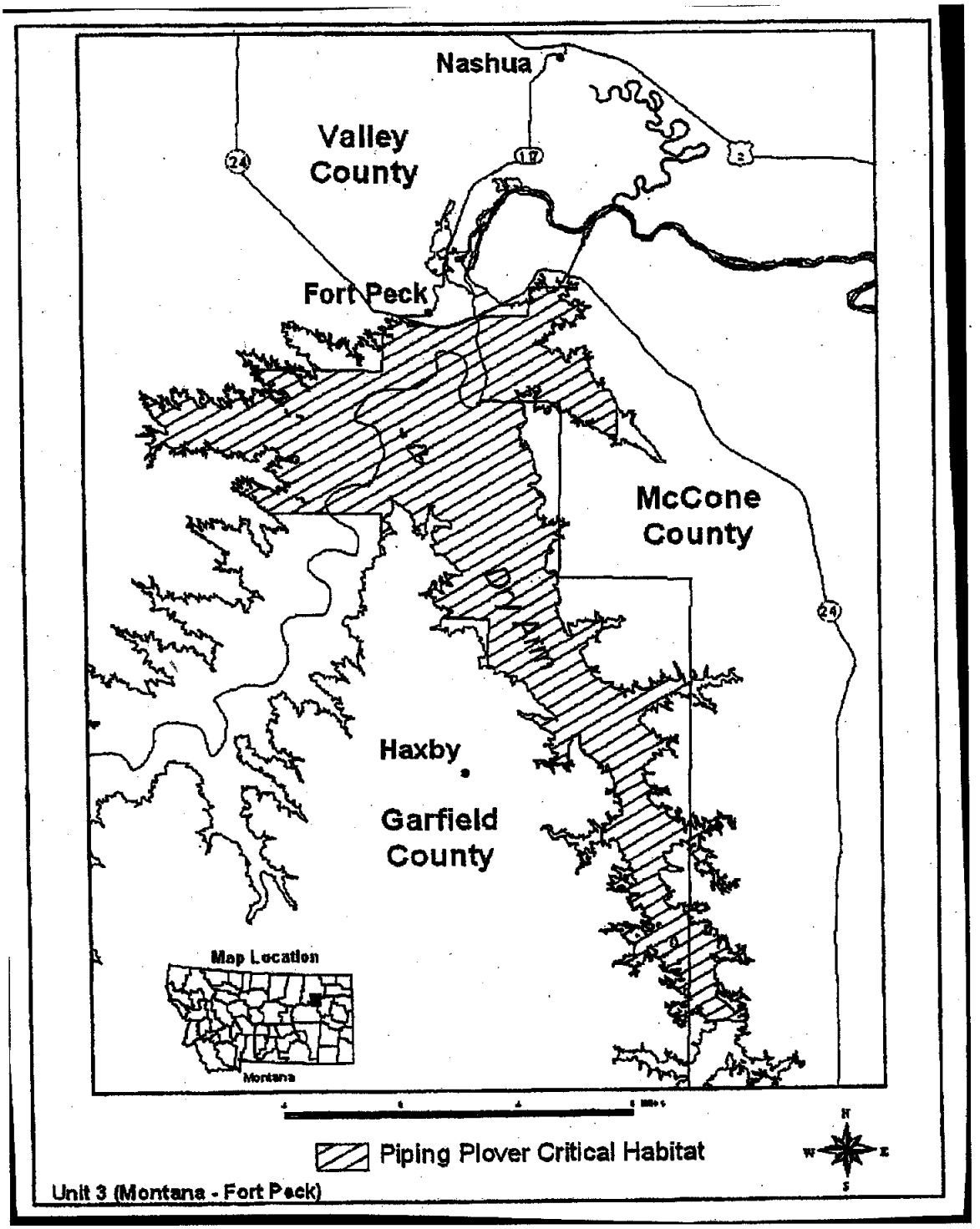
Fort Peck Lake

Piping plovers have been surveyed on Fort Peck Lake since 1986. The birds have been found on the eastern part of the lake, especially the Dry Arm and Bear Creek Bay. Plovers have been known to arrive on Fort Peck Lake as early as late April with the majority arriving and initiating nests in May. On average, 11.1 plovers have been found during the annual adult census with a high of 30 adults found in 1993 and a low of zero in 1996 and 1997. Factors influencing plover numbers include the water level of the lake and the amount of vegetative cover on the beaches. Productivity on the lake is fairly robust with 1.41 chicks fledging per adult pair. System wide the fledge ratio is 1.00 chicks per adult pair. In 2001 four adult plovers were observed on the lake. There were two nests, one was successful with two chicks fledging for a fledge ratio of 1.00.

[17] petitioned for delisting

The USFWS has listed critical habitat for the piping plover along much of the shoreline of Fort Peck Lake, as depicted in Map 2 (Federal Register Vol 66, No. 113, June 12, 2001).

Map 2. Critical Habitat – Fort Peck Lake

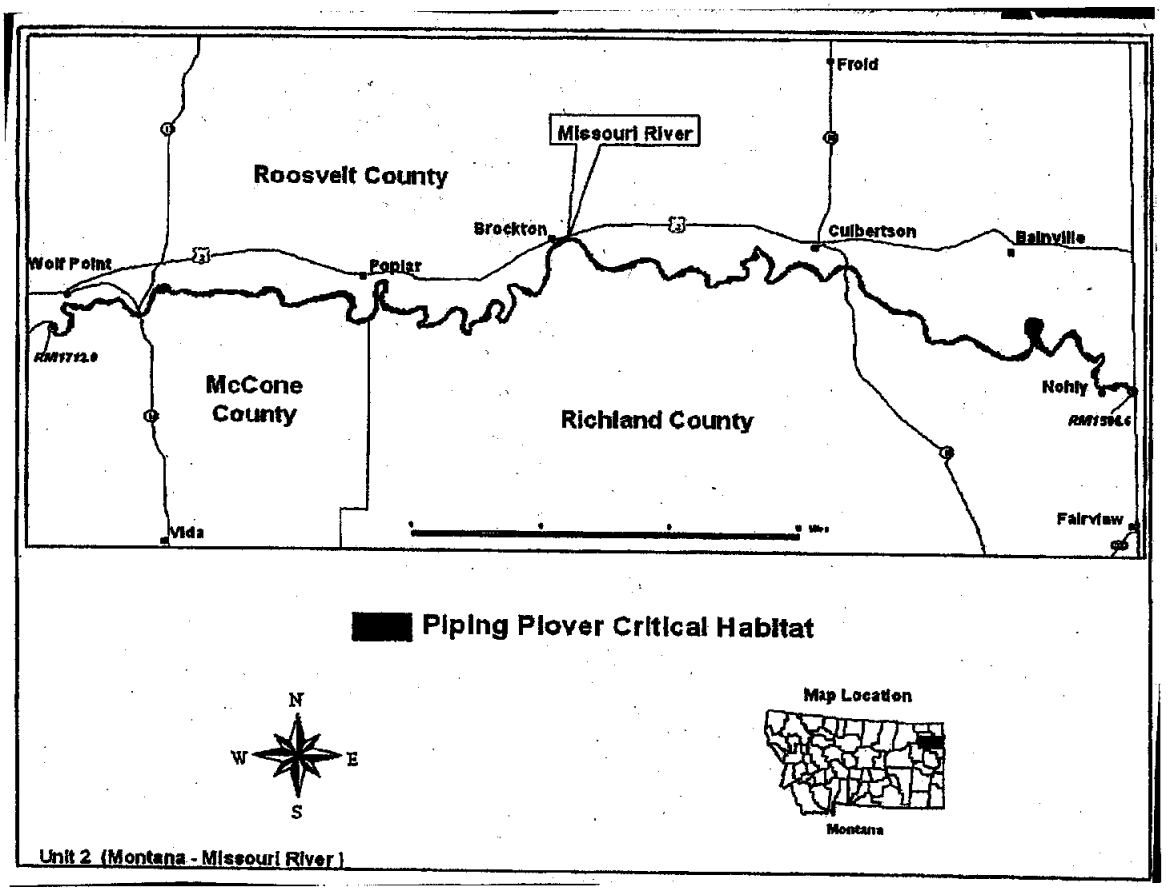


Missouri River below Fort Peck Dam (RM 1771 – RM 1568)

Piping plovers on the Missouri River below Fort Peck Dam have been surveyed from 1988 through 2001. Plover numbers are low on this stretch of the river with an average of 10.1 birds counted during the annual adult census. The high for the river was 1996 when 24 adults were seen and the low was 1992 when no plovers were observed. The highest numbers of plovers have been found on the river from RM 1690 to RM 1670. The plovers arrive on the river around mid May with the majority of nests being initiated in late May and early June. Productivity is below average compared to the entire Missouri River System with 0.86 chicks fledging per adult pair on the river and 1.00 chicks fledging per adult pair system wide. In 2001 three adult plovers were counted during the adult census. There were two nests on the river, both hatched with two chicks fledging for a fledge ratio of 1.33.

The USFWS also listed critical habitat for the piping plover along the islands within portions of the Missouri River below Fort Peck Dam, as depicted in Map 3 (Federal Register Vol 66, No. 113, June 12, 2001).

Map 3. Critical Habitat – Missouri River Below Fort Peck Dam



Least Tern

Fort Peck Lake

Least terns were first observed in the project area in 1987 and will nest in similar areas as the piping plovers, often in the same colony. Least terns nest on river islands more than the piping plovers do, however.

Least terns begin to arrive at the lake in late May with most nests being initiated in early to mid June. Tern use of Fort Peck Lake however is incidental at best. Adult censuses have been conducted on the lake from 1987 through 2001 with an average of 3.5 adults being observed. The high for the lake was 1991 when ten terns were seen. The low has been 1992, 1996, 1997, 1999 and 2001 when no terns were observed. Productivity is below average on Fort Peck Lake compared to the entire Missouri River System with .52 chicks fledging per adult pair on the lake and .72 chicks fledging per adult pair system wide.

Missouri River below Fort Peck Dam (RM 1771 – RM 1568)

Least terns on the Missouri River below Fort Peck Dam have been surveyed from 1988 through 2001. In contrast to piping plover, least tern numbers are quite good on this stretch of the river with an average of 67.5 birds counted during the annual adult census. The high for the river was 1997 when 162 adults were seen and the low was 1988 when 18 adults were observed. This part of the river can be very important for least terns if habitat is unavailable on the lower parts of the Missouri, as was the case in 1996 and 1997.

The most frequently used sections of the river are from RM 1690 to RM 1670 where 123 adults have been counted and from RM 1610 to RM 1590 where 177 adults have been counted. The terns arrive on the river around late May with the majority of nests being initiated in early to mid June. Productivity is below average compared to the entire Missouri River System with 0.62 chicks fledging per adult pair on the river and 0.72 chicks fledging per adult pair system wide. In 2001 39 adult terns were counted during the adult census. There were 20 nests on the river, 13 hatched with 20 chicks fledging for a fledge ratio of 1.03. Map depicting least tern and piping plover nesting areas within the Missouri River below Fort Peck Dam can be found in Appendix I.

Pallid Sturgeon

Pallid sturgeon are present in the lake, the tailrace pool, and the Missouri River below Fort Peck Dam. One of the few remaining concentrations of pallid sturgeon occur on the Missouri River between Fort Peck Dam and the headwaters of Lake Sakakawea, and in the lower Yellowstone River (Bramblett, 1996). Appendix J provides maps indicating pallid sturgeon capture information, based on the USFWS nationwide database housed in the Bismarck, North Dakota office of the USFWS.

- Altered hydrograph
- Altered river temperatures
- Habitat alterations (including obstructions to migration, such as the dams)

Pallid sturgeon have been collected at more than 280 locations in the Fort Peck reach and the lower Yellowstone River. A detailed listing of capture locations including data, river mile, length, and weight, can be found in the Fort Peck Flow Modification Biological Data Collection Plan, hereafter referred to as the Fort Peck data collection plan, found in Appendix F).

Stomach Analyses

In addition to those reasons that most often come to mind, other, less likely potential reasons for the decline of pallid sturgeon exist within this reach. During the scoping process, local landowners indicated that piscivorous (fish-eating) fish fed on small sturgeon in tributaries to the Missouri River. This has not been documented, although few stomach analyses have been done within this reach. Collection of piscivorous fish for stomach analysis began during the summer of 2001 in order to address this concern.

Food habit data for burbot, channel catfish, freshwater drum, goldeye, northern pike, sauger, shovelnose sturgeon, and walleye were obtained during July and August of 2001 and 2002. Although each species exhibited piscivory (eating of fish), there was no evidence that sturgeon larvae or juveniles were consumed. Goldeye and catfish were found in examined stomachs, as well as parts of other unidentified fish. However, stomach evidence of predation is difficult to quantify, especially for fish such as sturgeon.

Other studies also provide some input into the predation concern. During a concurrent stomach content analysis of predators as part of an experimental predation study of larval fish by adult bluegill and white crappie, the stomach analyses did not accurately quantify predation rates or detect any consumption of small larvae which was known to occur, based on the experimental study (Kim and DeVries, 2001). Walleye are "gape limited" feeders, so the size of prey eaten is limited to the size of the fish, with small walleyes preying on age 0 or juvenile fish (Jackson et al, 1993). On average, walleye can consume prey up to 29 percent of its body length, with a maximum of 44 percent of its body length (Knight et al, 1984; Porath, 1996). The presence of large year-classes of yellow perch or alewives has been shown to buffer other prey species from walleye predation (Lyons and Magnusen, 1987).

Many predators are opportunistic feeders, so any prey species of appropriate size is a potential food source, including sturgeon, but no sturgeon remains were identified in fish stomachs to date. In addition to fish, insects, crustaceans, spiders, worms, fungi, detritus, and even parts of mammals and birds were identified in stomach contents (Braaten, 2003). Prey species that are abundant are more likely to be consumed than species that are not abundant.

Seasonal Movement

Movements of pallid sturgeon in the Missouri River and lower Yellowstone River have been investigated by telemetry and summarized by various researchers (Clancy 1990; Tews and Clancy 1993; Tews 1994; Bramblet 1996). A summary of findings from each researcher can be found in the Fort Peck data collection plan. There are some generalities that can be stated from the data currently available.

For pallid sturgeon tagged near the Yellowstone River confluence, the following patterns are suggested (Tews 1994; Bramblett 1996):

- Movement from the Missouri River to the Yellowstone River during April and May
- Residence in the Yellowstone River during May, June, and July
- Movement into the Missouri River/Yellowstone confluence during late summer
- Little movement in the winter

Pallid sturgeon tagged in the Fort Peck tailrace area exhibit different movement patterns. They either move downstream in the Missouri River during April, or they remain in the tailrace area year-round.

As part of the Fort Peck data collection plan, movements of radiotagged (CART transmitters) pallid sturgeon and selected native species will be monitored using both boat-based receiving units (summer) and multiple fixed data logging receivers (continuous). In addition to following radiotagged pallids, researchers will be drifting trammel nets over radiotagged sturgeon periodically to sample for individuals that may be associating with radiotagged pallid sturgeon.

Larval sturgeon

Larval sampling has been done at several locations in various years in the Missouri River downstream from Fort Peck Dam to determine if pallid sturgeon were successfully spawning. Details about the information collected, what was found, and the researchers can be found in the pallid sturgeon monitoring plan. Several studies reported collections of sturgeon larvae *Scaphirhynchus spp.,* but positive identifications prior to 2002 indicated that all were shovelnose sturgeon (Ruggles, MTFWP). However, Braaten and Fuller report that larval fish sampling associated with pre-test monitoring captured two larval pallid sturgeon during early September, 2002 in the Missouri River downstream from the Yellowstone River confluence. These findings are the first documented account of larval pallid sturgeon in the Missouri River downstream from Fort Peck Dam, and indicate that successful spawning by pallid sturgeon did occur during 2002. However, it is unknown whether spawning occurred in the Yellowstone River or the Missouri River (Braaten and Fuller, 2003). Larval fish sampling is ongoing as part of the Fort Peck data collection plan preceding the mini test, as well as during the mini test (and full test). Exact collection methodology and constraints are discussed in Appendix F.

Turbidity is much reduced downstream from the dam, but sediment contributions from the Milk and other tributaries seasonally elevate turbidity (Gardner and Stewart, 1987). Pallid sturgeon larvae require an extensive length of free-flowing riverine habitat to complete their 8 to 13 day larval drift period (Kynard et al, 1998). It is hypothesized that cool water temperatures in the Missouri River inhibit spawning and that suspected spawning areas in the lower Yellowstone River do not allow for sufficient drift time for successful spawning. Increasing the water temperature in the Missouri River to 18 degrees C at Frazer would not only increase the suitability of that area for pallid sturgeon

spawning, but it would also allow a longer drift distance for the developing larvae if spawning was successful. Preliminary data from the larval drift study indicate that most larval sturgeon drift at the same rate as the water in the river.

Socioeconomic Baseline & Existing Conditions

Recreation

Fort Peck Lake

The original Corps' Master Plan for recreational use of Corps lands at Fort Peck was approved in 1946 and updated in 1965. This Master Plan, which identifies areas of recreation as well as those areas set aside for wildlife, was updated again in 1992. The 1992 update allocated approximately 2,500 additional acres to intensive recreation on Corps land within the vicinity of Fort Peck Lake for a total of over 7,000 acres identified for recreational use. The updated Master Plan identified 18 new recreation sites (US Corps of Engineers, 1992).

The Fort Peck area receives low to moderate density visitation, which is primarily concentrated at the few designated recreation areas near highways. Summer visitation primarily consists of sightseeing, camping, picnicking, fishing, hunting, and boating. Water based recreation at Fort Peck Lake includes fishing, boating, water skiing, swimming, and waterfowl hunting. Picnicking, camping, upland game hunting and sight seeing are also popular pastimes in the project area. There were 495,511 user days of recreation activity reported for the Fort Peck project, including the lake and downstream facilities, in fiscal year 2000 (October 1 through September 30). The quality and extent of these activities, for the most part, are at least indirectly dependent on the presence of the lake.

Missouri River below Fort Peck Dam

Recreational activities on and near the river include fishing, boating, water skiing, water fowl hunting, swimming, picnicking, upland game hunting, and sight seeing. Recreation facilities, including boat ramps, are located within a few miles downstream of the dam. These recreation areas include Goose Pond, Downstream, Nelson Dredge, Floodplain Recreation, Round House Point, Nature Trails, First Dredge and Second Dredge.

Fort Peck Reservation

The presence of only two boat ramps within the Fort Peck Reservation is considered a problem by the Tribes. The low number of boat ramps was brought up by the Tribes during consultation; however, this is outside the scope of the Fort Peck mini test action.

Hydropower*

The Fort Peck spillway is utilized only when release requirements exceed the 15,000 cfs discharge capacity of the two powerplants. Water power is converted to mechanical power by turbines and then to electrical power by the generators attached to the turbine shafts. Efforts are made to maximize the production of electricity within the parameters of other project purposes. The Fort Peck powerplant has a nameplate rating of 185.25 megawatts. Fiscal year 2002 main stem generation was 7272 gigawatt-hours (GWh), 73 percent of average. Fiscal year 2002 revenue for the Missouri River main stem plants was $102.8 million.

The Western Area Power Administration (WAPA) is an agency of the Federal government, within the Department of Energy, established expressly to market and distribute hydropower produced in its region at Corps of Engineers and Bureau of Reclamation projects. Total sales in fiscal year 2002 were 10,838 GWh, valued at $179,285,000. Power is distributed to preference customers as prescribed by legislation. Power in excess of these customers needs is sold on the open market. Power generated by the Corps main stem Missouri River dams and Canyon Ferry and Yellowtail dams, which are operated by the Bureau of Reclamation, is distributed in the Upper Great Plains Region. Within this region WAPA serves all or parts of the states of Montana, North Dakota, South Dakota, Nebraska, Minnesota, Iowa, and a small part of the state of Missouri.

Riverbank Erosion*

Stream bank erosion occurs at various points along the Missouri River between Fort Peck Dam and Lake Sakakawea. The location and extent of erosion varies over time and is dependent on many variables. These include the annual volume of flow, the location and duration of flows, the direction of flow, the susceptibility of the soil at a given site to erosion and other factors. Although erosion along the river varies from place to place over time, it is widely believed to increase during periods of prolonged high discharge.

Irrigation*

The Missouri River provides water for irrigation in this semi-arid region. There is normally ample water available to irrigate thousands of fertile acres of Missouri River bottomland. Without the availability of water, these acres would be committed to dry land crops, thereby producing only a fraction of the value of their current yield. The deposition of sediment and the occurrence of high bank erosion can adversely affect existing water intakes and limit the availability of good intake sites. Both deposition and bank erosion vary for a wide variety of reasons, including water flow. Water intakes between Fort Peck dam and Lake Sakakawea are normally constructed in locations believed to provide long-term use. Due to variation in periodic flows and in associated sedimentation or erosion, water intakes are required to operate within a broad range of conditions.

* An issue raised during public scoping

Water pumped from the river in the area is used to irrigate hay, barley, sugar beets, oats, and beans (Roosevelt County Conservation District, 2002). A regional water system that would serve the Fort Peck Reservation and most of the non-Tribal lands in Montana north of the Missouri and east of Glasgow is currently being developed, with a proposed intake near the town of Poplar, Montana (ibid).

According to a 1994 survey of water intakes on Fort Peck Lake and the Missouri River below Fort Peck Dam, the following information is available for water intakes:

Table 6. 1994 Survey of Water Intakes

	Municipal	Industrial	Irrigation	Domestic	Public
Fort Peck Lake	1	0	5	101	2
Missouri River	5	4	283	162	1
Tribal Reservation	1	0	94	14	0

A survey of water pumps in the Missouri River below Fort Peck Dam during the summer of 2001 identified 143 pumps; 55 were on the north side of the river and 87 were on the south side (Roosevelt County Conservation District, 2002).

Appendix K contains maps indicating the location of water intakes based on the 2001 survey.

Water Supply*

There are no municipal or rural water district water supply intakes in the immediate vicinity of the dam. Intakes for these purposes are located at Wolfe Point and Culbertson, Montana, and Williston, North Dakota. An intake site for the Fort Peck Indian Reservation Rural Water System, which would serve the reservation and four counties in northeast Montana, has been proposed on the Missouri River near Poplar, Montana. There are also several hundred water intakes for irrigation and domestic uses between Fort Peck Dam and Lake Sakakawea.

Socioeconomic

Region of Influence

The Missouri River below Fort Peck Dam flows through Valley, Richland, McCone, and Roosevelt counties in Montana, and McKenzie and Williams counties in North Dakota.

* An issue raised during public scoping

The socioeconomic background for these counties is displayed for background information, and for consideration with regard to the Environmental Justice executive order.

Population

The year 2000 population and racial composition for the six county region are shown in Table 6. As shown in the table, population has declined during the past decade. In the year 2000, the population of all six counties totaled 55,437. The racial compositions of McCone, Richland, and Valley counties in Montana and McKenzie and Williams counties in North Dakota are predominately white. In Roosevelt County, which includes part of the Fort Peck Indian Reservation, over half of the population is classified as Native American.

Table 7. Population and Race, Ft. Peck Counties, Year 2000

State County	Population Year 2000	Percent Change Since 1990	Population by Race			Percent Population		
			White	Indian	Other	White	Indian	Other
Montana								
McCone	1,977	-13	1,917	21	39	97	1	2
Richland	9,667	-10	9,338	145	184	97	1	2
Roosevelt	10,620	-3	4,347	5,921	352	41	56	3
Valley	7,675	-7	6,765	6	904	88	0	12
North Dakota								
McKenzie	5,737	-10	4,440	1,216	80	77	21	3
Williams	19,761	-7	18,358	869	534	93	4	2
Region	55,437	-7	45,165	8,179	2,093	81	15	4

Source: U.S. Census of Population 1990 and 2000.

Employment and Income

The unemployment level is normally a good indicator of the health of an economy. The unemployment level is the percentage of the labor force who are actively seeking employment, but who are not employed. Due to normal job changes and other reasons, full employment is generally believed to exist at about the 4.0 percent unemployment level. In the year 2000, unemployment averaged 4.9 percent in the State of Montana. In McCone, Richland, Roosevelt, and Valley counties it was 3.2, 6.2, 9.5, and 4.1 percent respectively. The unemployment rate for the State of North Dakota was 3.0 percent the same year. In McKenzie and Williams counties, it was 3.1 and 3.6 percent, respectively. The six-county area experienced an unemployment level of 5.1 percent. The Fort Peck Indian Reservation had an unemployment level of 10.8 percent. Reservation unemployment levels are often under-reported because job prospects are frequently so poor that many would-be employees stop registering and are no longer counted. The unemployment rate is also reflected in the income distribution within the area. As shown in Table 7, the Montana counties of McCone, Richland, and Valley and the North Dakota counties of Williams and McKenzie all have similar income levels. The average of the median annual household income for these five counties averaged $31,145 in 1997. Roosevelt had a median income of almost 25 percent less at $23.953. Figures for Roosevelt County, which includes the Fort Peck Indian Reservation, show a high level of persons living below the poverty level and a proportion of persons in this classification twice that of the states of Montana and North Dakota. Roosevelt County has the highest concentration of low income in the six-county region as reflected by the lower median household income and number of persons living below the poverty level. All six counties have lower income and a higher percentage of people living in poverty than the United States as a whole. In 1997 the National median income was $37,005, with 13.3 percent of the population living below the poverty level.

Table 8. Income/Persons Living In Poverty, Years 1997/2000

State County	Median Household Annual Income	Persons Below Poverty Level Number	 Percent of Total
Montana			
McCone	$28,974	285	14.4
Richland	$31,885	1,554	15.5
Roosevelt	$23,953	3,303	31.1
Valley	$29,581	1,382	18.0
State of Montana	$29,672	139,840	15.5
North Dakota			
McKenzie	$32,034	1,124	19.6
Williams	$33,249	2,589	13.1
State of North Dakota	$31,764	80,275	12.5

Note: The persons below the poverty level figures are based on 2000 population counts and 1997 income levels. Accordingly they may be off by a small margin.
Sources: Economic Census 1997. U.S. Census of Population and Housing 2000.

Cultural Resources

Archeologists divide the cultural chronology for the eastern Montana area into several different eras or periods. These include the Early Prehistoric Period, Middle Prehistoric Period, late Prehistoric, the Protohistoric Period, and the Historic Period.

The Early Prehistoric Period (similar to the Paleoindian Period in regions further east) is the time between 11,000 Before Present (BP) to 7,700 BP. The archeological record indicates that these people were big game hunters during the earlier parts of this period and bison hunters during the later parts. Included within this time period are the Clovis, Goshen, Agate Basin, Hell Gap, Alberta, and Cody complexes. Spear or dart points are part of the archeological record from this period.

The Middle Prehistoric Period is described as the time from 8,000 to 1,300 BP. This is synonymous with the Early, Middle, and Late Archaic and early Woodland periods along the Missouri River farther to the east. This period includes Mummy Cave, Oxbow, McKean, Pelican Lake, Yonkee, Sandy Creek, and Besant type projectile points. During this time, people hunted bison and many other species of animals. Late in this time period, pottery becomes part of the archeological record at some sites. The bow and arrow were also invented late in this period.

The Late Prehistoric Period runs from 100 AD to Historic times. Bison hunting was the main means of procurement and communal hunting was practiced. This period is similar to the Late Prehistoric and Protohistoric periods described for the Central Plains.

The Historic Period is marked by written records. The eastern Montana area is inhabited by Gros Ventres (or Atsina), Piegan (or Blackfoot) and Assiniboine. Much later, the Chippewa and Cree people arrived at the Rocky Boys Reservation.
The Historic Period is also marked by the travels of Lewis and Clark up the Missouri River. Much has been written about this expedition in both popular and scholarly journals. The Historic Period also includes the fur trade, ranching, railroads, the homestead era, and the Great Depression. The fur trade is highlighted by the construction of many fur trade posts and forts. Fort Galpin was constructed about 12 miles above the confluence with the Milk River in 1862. Fort Copeland was constructed in 1865 at the confluence of the Milk River and the Missouri. Fort Peck was built in 1866, near the current site of the town of Fort Peck. Fort Peck also served as an Indian Agency from 1873 to 1879. Fort Kaiser was constructed in 1885, immediately downstream from the confluence of the Milk and Missouri Rivers (near the site of the defunct Fort Copeland). All of these fur trade posts were in commission for at least one or two years and a few continued for several decades.

Ranching was also part of the historic era. Cattle and sheep ranchers settled in eastern Montana in the late nineteenth and early twentieth centuries. The construction of the Great Northern railroad in 1887 and the Chicago, Milwaukee, St. Paul, and Pacific railroad in 1905 further emphasized ranching. The railroad companies provided the means for European immigrants to settle much of the land on either side of the route. These companies also encouraged settlement with somewhat exaggerated descriptions of the land in the eastern part of the state. Homesteading began around 1900 and continued with periods of plentiful rainfall until 1916. At that point in time, rainfall amounts declined on the northeastern part of the state and many homesteaders gave up farming for other occupations.

In more recent times, the state was hit with the effects of the Great Depression. To counter unemployment, Roosevelt initiated the New Deal plan. His first big project was Fort Peck Dam which began in 1933. This project provided jobs for many of the unemployed. Workers brought their families, since it was impossible to earn enough money to maintain themselves at the dam site and their family at another location. As a result, many boomtowns sprang up around the dam site. More people arrived than the government had anticipated. Up to 10,000 people were employed, either directly or indirectly, at the height of the construction season. Almost all of these boomtowns are gone and the town site of Fort Peck has decreased to just a few hundred people. Today, the eastern Montana-Fort Peck area is working hard to maintain a viable economy with ranching, farming, and tourism as a basis for economic health.

The reach of the Missouri River downstream from the Fort Peck spillway to the Highway 85 bridge in North Dakota has the potential to contain many types of cultural sites. These could include prehistoric campsites, procurement areas, sacred areas, stone effigies, early fur trading forts, historic homesteads, sites associated with railroads (bridges, abutments, graded lines), and sites associated with farming and ranching.

Although most of the Corps' land surrounding Fort Peck Lake has not been surveyed for cultural sites, known sites consist of lithic scatters, campsites, tipi rings, and historic structures. The townsite of Fort Peck has many buildings that are listed on the National Register of Historic Places (NRHP). As mentioned earlier, Fort Peck Dam and powerhouse are listed on the NRHP. The Fort Peck Dam is under consideration for National Historic Landmark status.

Fort Peck is rich in paleontological remains, including those of world-wide significance such as the *Tyrannosaurus rex* unearthed near Nelson Creek.

The Corps funded a cultural site inventory within the project vicinity, approximately 200 miles of the Missouri River below Fort Peck Dam. The contractor surveyed lands within 150 feet of the Missouri River along both banks in order to identify cultural "features." The "features" of a site help to determine a site's significance with regard to the Natural Historic Preservation Act of 1966. "Features" are specific activity areas which have become part of the historic or prehistoric record. Features include such things as hearths, ash lenses, post molds, cache pits, root cellars, or cairns (a pile of rocks to mark a special area or part of a trail). Many other aspects of a site would qualify as a feature as well: a grain bin, a pump house, a stone or brick walkway, a windmill, a stone circle, or a tipi ring.

Generalized site information can be found in Appendix D.

VI. Environmental Impacts of the Test

This section describes the anticipated impacts to the human environment as a result of the test. Concerns identified in scoping meetings with the public, agencies, and Tribes are indicated with an asterisk (*).

The environmental impacts of the "no action" alternative (not running the test) would be a continuation of the range of conditions presented in the "Affected Environment" section of this EA.

Environmental Impacts

Water Quality

The potential change in ambient Missouri River water quality conditions would be dependent of the difference in water quality conditions between the spillway and powerhouse discharges. It is not expected that the spillway discharge would noticeably affect other water quality conditions, other than temperature.

Changes in Turbidity

Because the mini test is within the range of "normal" flows in a 5-year hydrograph, turbidity changes associated with the mini test volume of flows would not be considered abnormal; therefore, while still a concern by the public, these flows are not significant. In fact, a rainstorm event would likely provide a greater increase in turbidity than the mini test. Table 5 reflects the high degree of variation during a "no test" timeframe.

However, directly across the spillway there is the potential for up to 5 acres of erosion, if a bank stabilization is not built to prevent this erosion (see Executive Summary, "Unresolved Issues"). Turbidity monitoring would be conducted during the mini test to address this concern.

Changes in Water Temperature

Water in the spillway flows about 1½ miles from the lake before it enters the Missouri River approximately 7 river miles downstream of the dam and 1 mile upstream from the confluence of the Milk River.

During the mini test, warmer water from the upper portion of Fort Peck Lake would form a plume[18] as the spillway discharge enters the cooler Missouri River. The Missouri River above the spillway discharge point would be entirely comprised of the cooler water discharged through the powerhouse. The plume of warmer water would not be visible by sight, but may be detected by temperature sensors in the water. Since the spillway flow would be roughly 3 times the volume of the powerhouse flow during the highest spillway

[18] a temporary, concentrated area of unmixed water

discharge, complete mixing would be expected to occur in a reasonable distance downstream, depending on the angle of spillway entry into river and channel morphology. The situation is complicated by the discharge of the Milk River entering the Missouri River approximately one mile downstream of the spillway discharge. Mixing of the Milk River discharge with the powerhouse and spillway discharges (i.e., Missouri River) would be dependent on the magnitude of the discharge of the Milk River and channel conditions at the confluence of the Milk River. A plume of Milk River water should form along the north bank of the Missouri River until complete mixing occurs. The USGS maintains a gage on the Milk River at Nashua, Montana (near the mouth of the Milk River). The period of record for this gage is 1940 to present. Based on 1940 to 2000 flow measurement records, the monthly mean streamflow at this gage for May and June is 1,026 cfs and 960 cfs, respectively.

The methodology to project the potential temperature increase resulting from the mini test consists of a "mass balance" calculation, taking into consideration the volume of "warm" water from the spillway and the volume of "cool" water being discharged from the powerhouse. Initially, a plume of warmer water would enter the Missouri River water from the spillway. At complete mixing (disregarding heat radiation, spring inflows, etc.) a weighted mass balance of temperature among the three flows (spillway discharge + powerhouse discharge + Milk River discharge) would be a rough estimate of ambient river water temperature -- [(11,000 cfs x spillway temperature) + (4,000 cfs x powerhouse temperature) + (960 cfs x Milk River temperature /15,960 cfs]. The "ambient" or existing water temperature achieved downstream of the Milk River will be dependent on the amount of flow coming in from the Milk River, its temperature, and the water temperatures of the spillway and powerhouse discharges. The greater the difference in water temperature between the spillway and the powerhouse and the lesser the flow of the Milk River, the greater the increase in ambient water temperature of the Missouri River below the confluence of the Milk River. Other parameters that could affect the resulting temperature include solar radiation (number of sunny days during June), air temperature, groundwater inflow and temperature, and rainfall events.

The number of data observations for Fort Peck Lake surface water temperatures is limited – 9 and 11 observations for the months of May and June. In comparing the powerhouse and lake surface water temperatures for the months of May and June, it can be seen that the lake surface is only marginally warmer for the month of May, but significantly warmer for the month of June. Using the mass balance equation (11,000 x 60 degrees F) + (4,000 x 54 degrees F) + (960 x 65 degrees F)/(15,960), calculated June water temperatures would be 59 degrees F at Frazier Rapids. This temperature is about 4 degrees F higher than the measured water temperature at Frazier Rapids during 2000 and 2001. However, this temperature is still below the targeted temperature from the Opinion.

Appendix F indicates the predicted maximum water temperature increase due to the mini test, based on an 11,000 cfs discharge down the spillway as well as the predicted minimum water temperature increase due to the mini test, based on a 4,000 cfs discharge down the spillway.

Consistency with Water Quality Regulations

Usually, water is discharged through the powerhouse and is not released over the spillway except during flood events. Dam operations are considered "natural" with regard to water quality regulations since these laws were enacted after the dam was in place. However, if the predicted water temperature increase was not in conjunction with dam operations, then a temperature increase could be in conflict with State and Tribal water quality regulations. For instance, if the temperature goals of the Opinion cannot be met through changes in the operation of the dam (e.g., if water needs to be heated before being discharged, or other means such as ponding would be pursued), then additional coordination with the State and the Tribes would be needed before implementation.

A clarification of the application of the State of Montana's water quality laws and regulations regarding the potential increase in water temperature due to a purposeful spillway discharge is being pursued with the Montana Department of Environmental Quality (MDEQ). A copy of that letter, dated December 20, 2001, can be found in Appendix F. A clarification of the application of the Tribes' water quality standards to the Fort Peck mini test is also being pursued with the Assiniboine and Sioux Tribes Office of Environmental Protection in a letter dated December 21, 2001. This letter can also be found in Appendix F.

The National Academy of Sciences report referenced a legal case that indicated that dams are not considered as "point sources" with regard to Clean Water Act regulations (National Wildlife Federation v. Gorsuch, 693 F. 2d 156, D.C. Cir. 1982 in National Academy of Sciences, 2002).

Lake Levels*/Discharge Volume*

The 1967-2000 June average daily release from Fort Peck is 10,500 cfs or 625,000 acre-feet. Should Upper Quartile runoff occur in 2002, the forecasted Fort Peck June release is 8,500 cfs or 506,000 acre-feet. If the mini test is conducted entirely in June, the average release for the month is 12,800 cfs or 762,000 acre-feet. Therefore, an additional 256,000 acre-feet would be released as a result of the mini test and Fort Peck Lake would be at elevation 2234.7 feet msl on June 30 compared to elevation 2235.9 feet msl if the mini test is not conducted. This would result in an elevation decline (or a slowing of the rate that the lake level increases) equal to 1.2 feet.

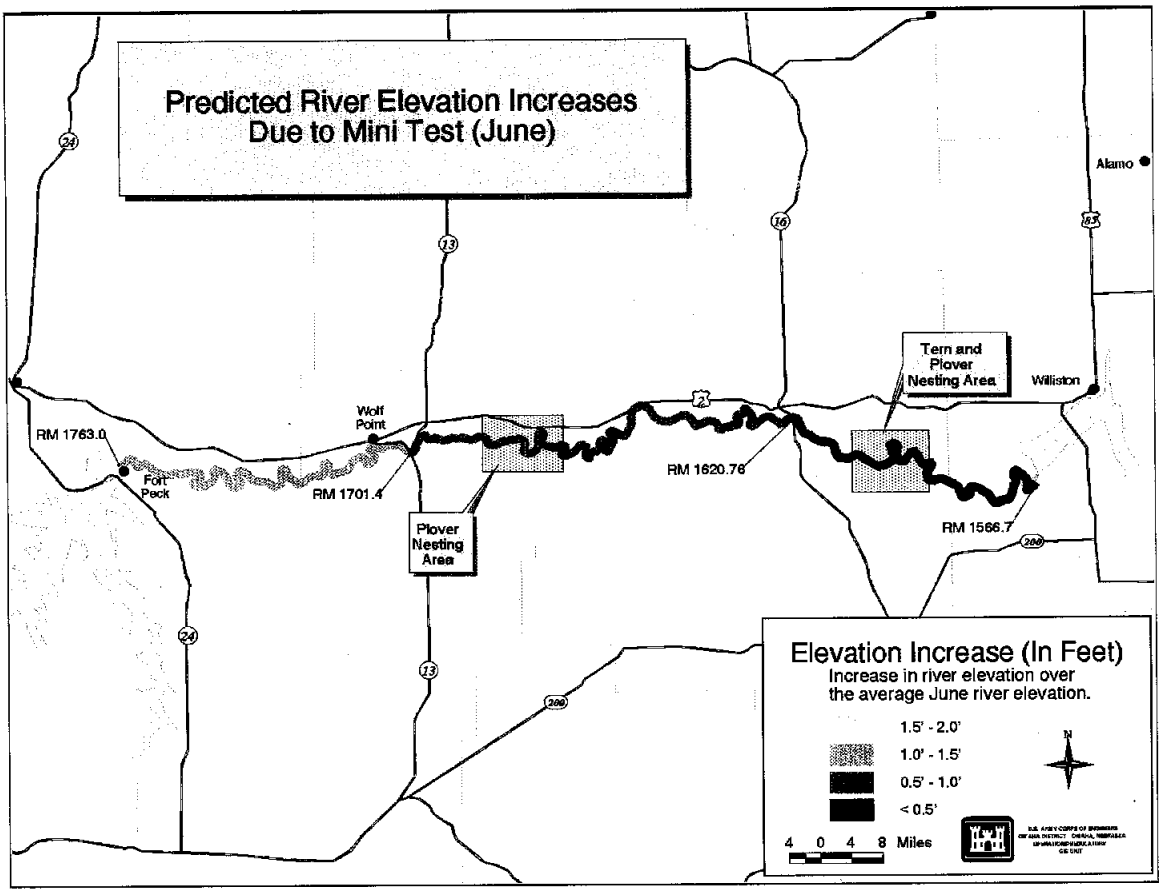
River Elevation and Flooding*

Although spring flooding and high water tables are problems along this reach of the Missouri River, the test should not greatly increase either (project increase in river elevation of approximately 1.5 feet for most of the reach). As indicated previously, the flow would be that which normally experienced or exceeded every two or three years with normal discharges. In the event of an unusually high flow on the Yellowstone

* An issue raised during public scoping

River, the test can be stopped to avoid adverse impacts.

Map 4. Anticipated River Elevation Increase due to Mini Test



Drought*

The mini test would not occur during a drought year, since a lake elevation of 2,230 feet msl is needed to proceed with the test. Therefore, the mini test would not exacerbate problems associated with drought.

Wetlands

Fort Peck Lake Wetlands

The discharge of water associated with the mini test would likely result in an ending June lake elevation 1.2 feet below what would be expected if the mini test didn't take place. Since the exposed shorelines along Fort Peck Lake are not prone to lush stands of wetland vegetation and since the elevation decrease is temporary, there would be no impact on wetland vegetation within the lake. Much of the lake shoreline is currently not suitable for wetland development for various reasons (soil type, wind-wave action,

"normal" lake fluctuation). In other reservoirs, however, when lake levels are temporarily reduced, plant establishment along the shoreline is anticipated.

Wetlands in the Missouri River below Fort Peck Dam

The river elevation is expected to increase up to 1.5 feet in conjunction with the mini test, tapering to a lesser amount as the water moves downstream into wider river segments. River wetland communities have experienced changes in river elevation in the past and can tolerate these temporary changes in elevation. The additional water may act to facilitate additional temporary wetland growth along the river banks.

Mosquito Control[*]

A concern was expressed by the public that the additional water would increase mosquitoes as a result of an increase in watered areas suitable for breeding. Since the mini test consists of discharges seen every 2 or 3 years and the overall water volume remains the same (the amount of water added to the river during the mini test = the amount of water leaving the lake during the mini test), the mosquito population in the project area (Fort Peck Lake + Missouri River below Fort Peck Dam) would not be affected by the mini test.

An increase in mosquito population is more likely due to an increase in overall precipitation (more water in the lake + more water in the river) where there is an increase in overall wet areas in the region.

Cottonwood Forest

Fort Peck Lake

The lake level drop of 1.2 feet during the month of June would have no affect on cottonwood survival or health. Cottonwoods are river pioneer species that have evolved to survive water elevation fluctuations, especially temporary fluctuations. Additionally, Fort Peck Lake fluctuates routinely (currently, the lake is over 14 feet below "normal" elevations).

Missouri River below Fort Peck Dam

The increase in river elevation from 0 to 1.5 feet above "normal" during the month of June will allow for an additional wet area along the root zone of the riparian corridor. This may trigger additional cottonwood regeneration, should a sufficient seed bank be available. Since the depth increase is temporary and is within the range of normal river elevation fluctuation, there would be no adverse effects to mature cottonwood forests.

[*] An issue raised during public scoping

Fisheries

Fort Peck Lake

The anticipated differential in the lake (1.2 feet lower than without the mini test) is not expected to have an adverse effect on the Fort Peck fishery. This decline is within the range of "normal" lake fluctuations over time and is much less than that seen during drought (currently the lake is over 14 feet below "normal").

Although wetland development along the shoreline of the lake is not anticipated, if wetlands (or terrestrial plants) would form along portions of the exposed shoreline, then that plant development would likely benefit fish when lake elevations increase and flood the vegetated shoreline. Submerged plants add nutrients to the water, provide a substrate for certain aquatic invertebrates, provide spawning substrate for vegetation-spawning fish, and provide cover for young fish.

The potential loss of lake fish over the spillway during the mini test will be monitored via the installation of a fish net across the spillway. By monitoring fish captured in the net during various spillway discharges, as well as the difference in fish numbers captured in the spillway pool while the net is up versus while the net is down, an approximate number of fish loss (if apparent) can be estimated to determine the scale of this concern.

Missouri River below Fort Peck Dam

Due to the minor warm-water discharge increase associated with the mini test (maximum 11,000 cfs down the spillway) and the resulting size of the temperature plume after dilution with colder Missouri River water at the spillway confluence, the warmest water (up to 4 degrees F increase) is not expected to continue downstream as far as the Yellowstone River confluence area. Therefore, impacts to paddlefish leaving a successful spawning area as a result of the mini test are unlikely. Impacts to paddlefish resulting from larger (or warmer) discharges resulting from the full test or implementation of an ongoing flow modification regime is outside the scope of this EA.

Radiotagged paddlefish are included in the Fort Peck data collection plan, and movement information from the mini test, as well as additional temperature information, will assist in better predicting the likelihood of a movement response in Yellowstone River paddlefish for future flow-related actions.

Threatened and Endangered Species

The U.S. Fish and Wildlife Service has already considered the biological effects of the mini test in the development of the Reasonable and Prudent Alternative for the Opinion and determined that the mini test is an integral component of the Fort Peck flow modifications to avoid jeopardy to listed species. Therefore, the Corps is not required to prepare a Biological Assessment (BA) for this action (U.S. Fish and Wildlife Service

letter, February 20, 2002). However, for the purposes of NEPA, this EA discloses the effects/benefits of the mini test on endangered species.

Black-footed Ferret

Since the black-footed ferret is a terrestrial animal and the Fort Peck mini test does not affect terrestrial areas, there would be no adverse affect on black-footed ferrets.

Bald Eagle

Since cottonwood forests are not adversely affected by the proposed mini test, there would be no adverse affect on bald eagles.

Piping Plover

To avoid piping plover impacts, a survey of the river would be needed before June 1 to ensure no nests have been initiated within 1.5 feet of the water surface elevation. The projected river increase of 1.5 feet in the area of highest nest concentration (RM 1670 – 1690) would likely prevent new nest formation due to the resulting wet sand. Nests would be monitored, and any eggs at risk would be relocated. As a result of the higher water, some vegetation scour could occur on lower portions of some existing islands.

Potential impacts to the piping plover would be avoided by monitoring low elevation nests and, if necessary, collecting eggs for transport to the hatchery at Gavins Point Dam if water levels become threatening. The Corps already has an endangered species collection permit under which eggs at risk could be collected and relocated, if needed (see Appendix E).

The drop in lake elevations of 1.2 feet due to the mini test could provide additional nesting substrate during the mini test.

Least Tern

To avoid least tern impacts, a survey of the river would be needed before June 1 to ensure no nests have been initiated within 1.5 feet of the water surface elevation. The projected river increase of 1.5 feet in the area of highest nest concentration (RM 1670 – 1690) would likely prevent new nest formation due to the resulting wet sand. Nests would be monitored, and any eggs at risk would be relocated. As a result of the higher water, some vegetation scour could occur on lower portions of some existing islands.

Potential impacts to the least term would be avoided by monitoring low elevation nests and, if necessary, collecting eggs for transport to the hatchery at Gavins Point Dam if water levels become threatening.

The drop in lake elevations of 1.2 feet due to the mini test could provide additional nesting substrate during the mini test.

Pallid Sturgeon

The mini test is not expected to have a negative effect on pallid sturgeon and, in fact, may have a slight positive effect on pallid sturgeon movement upstream into the Missouri River due to temperature increase resulting from the mini test (up to 4 degrees F). The primary benefit resulting from the mini test is the standardization of collection and tracking methodology prior to the implementation of the full test. The likelihood for pallid sturgeon movement responses is greatest immediately downstream from the spillway area (potentially the highest water temperatures); however, the majority of pallid sturgeon would already have moved into the Yellowstone River by June, based on previous movement studies (Tews 1994; Bramblett 1996) and therefore would not receive any benefits from the mini test. It is expected that the warm water "plume," if any, would not extend far enough downstream to serve as an attractant force for the Yellowstone fish. However, the Fort Peck data collection plan, especially the movement information, could provide movement data for confirming or refining this expectation for the mini test, as well as better predicting any movement expectations during the full test.

Socioeconomic Impacts

Recreation

Fort Peck Lake

Water based recreation at the lake is dependent on a sufficient water level. Low water or drastic changes in water elevation can affect the quality and quantity of recreational activity. High inflows to the reservoir normally occur in late May and the month of June. These flows are the results of snow melt in the mountain within the basin. This period overlaps the scheduled test. The lake level would normally be increasing during this period. The test release of water, in addition to the amount normally discharged, would attenuate the normal increase to some extent. Accordingly, water levels may be slightly lower than would otherwise be experienced (a decrease of 1.2 feet); however, current water levels are over 14 feet below what is considered "normal." A reduction of 1.2 feet would have a negligible effect on Fort Peck Lake, which normally experiences annual and periodic fluctuations of a much greater magnitude. In the event water levels are low due to drought or for other reasons, the test will be postponed, as was done in the year 2001. No major fluctuation in lake level is anticipated and accordingly, no appreciable negative impact to lake recreation is foreseen.

Missouri River below Fort Peck Dam

The increased discharge from Fort Peck Dam resulting from the test is well within periodic flows equaled or exceeded every two or three years. No change in the type, quality, or quantity of river recreation below the dam is anticipated as a result of the test. Some fishing activity may move in response to water levels or changes in conditions

advantageous to this activity and an increase in sightseeing as a result of spillway operation is likely. Neither is considered to be a significant impact.

Fort Peck Reservation

No change in the type, quality, or quantity of river recreation along the Missouri River shoreline within the Fort Peck Reservation is anticipated as a result of the test. Some fishing activity may move in response to water levels or changes in conditions advantageous to this activity, and an increase in sightseeing as a result of spillway operation is likely. Neither is considered to be a significant impact.

Hydropower*

During the mini test, a portion of the discharges from Fort Peck would be released through the spillway (up to 11,000 cfs) while maintaining a constant 4,000 cfs release from the powerplants. To the extent water is spilled, which would otherwise be used to generate electricity, the amount of energy generated during the test would be diminished. The amount of energy lost depends on the water level of the lake at the time of the release. More potential energy is lost at higher lake elevations due to the increased head at the powerplants.

Preliminary 2003 - 2004 Annual Operating Plan Simulations using the Current Water Control Plan indicate Fort Peck Lake would be at an elevation at which spillway releases could be made in June 2005 if upper quartile or greater runoff occurs during the next two years. A 13,000 cfs release would be required in June, July, and August 2005 to lower Fort Peck Lake to elevation 2234 feet msl (base of annual flood control pool) by March 1, 2006.

The Fort Peck mini test releases as specified in an August 28, 2001 clarification letter from the Omaha District would average 12,800 cfs in June. Therefore, the mini test would not change forecasted monthly releases from Fort Peck in 2005. The energy loss due to spillway releases would be 56 gigawatt hours (GWh) in June and 5 GWh in July 2005, reflecting the termination of spillway releases on July 2.

WAPA estimates the market value of energy in June and July 2005 at $56 per megawatt hour. The loss in energy generation is $3.4 million.

The test flow would result in a 61 GWh loss of energy. This was about 1 percent of the power generated by the main stem system during FY 2002 and 1 percent of the energy forecast to be generated during the affected period. A change of this magnitude can easily be picked up by another part of the power grid, provided other generating elements are readily available and not already working at capacity. A factor that could greatly increase the severity of this loss would be an energy shortage.

* An issue raised during public scoping

In the event there would be an energy shortage in an area impacted by the reduction in power production due to the spillway flow test, the test would be discontinued to prevent exacerbating the problem. The financial loss resulting from lost sales would be relatively small, being about 2 percent of annual sales and would not greatly affect WAPA or its service area. For these reasons, the loss of energy generation resulting from the proposed action is not considered to be significant.

Riverbank Erosion*

General Erosion

Downstream erosion to farmland, irrigation pump sites and resulting sedimentation are normal occurrences on the Missouri River. Since the test flow is of a magnitude which is met or exceeded by normal flows in a period of 2 to 3 years, average erosion rates within the Missouri River are anticipated during the test; however, site-specific erosion locations may vary.

Erosion Across from the Spillway

Erosion is normally not a problem across from the spillway outlet due to the infrequent use of the spillway. However, erosion could occur in this area as a result of spillway discharge. Because the spillway flows would not be accompanied by full powerhouse releases (as would occur during a flood event), the erosion in the immediate vicinity of the spillway could vary from erosion associated with a spillway discharge during a flood event. This could create an adverse impact to irrigation water intakes and pump sites located on land directly across from the spillway. To avoid potential adverse impacts, the water intakes could be moved or modified in such a manner as to allow their continued use during the test. The Corps evaluated alternative methods of protecting these intakes, including bank stabilization and intake relocation. Any modification to the site would be done only with landowners' consent and associated easements.

A site visit was conducted in November, 2000 and field data was collected and recorded including soil conditions and properties, pump site locations, and physical properties of the river. An estimated erosion rate was calculated by assuming that spillway flows would remove the toe[19] material from the bank. Bank failure would occur at the rate required to replace the eroded toe material. Based on this analysis, approximately 70 feet of bank loss (approximately 5 acres) could occur during the mini test (USACE, 2001c).

If a bank stabilization structure would be constructed, erosion would be prevented during the mini test, as well as for the full test (and potential future operational changes involving spillway flows).

Another option to the landowner would be to request that a sloughing easement be purchased by the Corps prior to the erosion. This would not prevent the erosion from

[19] supporting base

occurring, but would compensate the landowner in advance for the risk and likelihood of erosion due to the mini test.

Regardless if the potential erosion problem is resolved or not, the amount of erosion and the potential loss of irrigation pump sites (and associated economic impacts) are not considered to be an impact of regional significance, although the impacts may be locally important to the landowner.

Erosion downstream from the Spillway

Numerous studies of Missouri River bank erosion downstream from Fort Peck Dam have been conducted. One recent study was prepared for the Coordinated Resource Management Group - Lower Missouri River CRM (USDA, 1999). A second recent study was prepared as part of the Missouri River Master Water Control Manual review and update study (U.S. Army Corps of Engineers, 1998). The two studies present many conclusions regarding historic and future Missouri River bank erosion trends. Analysis conclusions regarding bank erosion causes and future trends are conflicting between the two studies. The studies and available data demonstrate that existing conditions are unstable and that erosion is occurring in the pre-test condition.

Assuming that the annual erosion rate is directly correlated with the annual flow volume, then the proposed test release would have no impact on the average annual erosion rate.

Because the volume of water discharged during the mini test would be "corrected" by the discharge of lesser volumes of water during the fall, the net annual discharge of water from Fort Peck Dam should still remain constant. As such, annual erosion of riverbanks below Fort Peck Dam (with the exception of "force" erosion across from the spillway) should also remain within the annual average within the reach.

Missouri River erosion processes are complex, and the mechanisms that cause erosion are often site-specific. If only the test flow time period is considered, erosion impacts of the test flow are difficult to quantify. The recommended approach is to perform monitoring during the test as described in the Bank Erosion Monitoring section found in Appendix E.

Since the annual erosion rate for the reach is expected to remain the same, erosion is not considered a significant impact of the mini test.

Irrigation*

Missouri River intakes

Water intakes are currently subject to periodic high and low flows and subsequent problems. Generally, the discharge from the dam for the mini test is within the range of normal periodic high flows, occurring on the average every 2 or 3 years. This document discloses the increase of river elevation of approximately 1.5 feet during the month of June (should a test occur) which allows the landowners time to make accommodations, if needed. No problems to downstream irrigation are anticipated as a result of the test.

The Roosevelt County Conservation District (RCCD), under contract to the Omaha District Corps of Engineers, gathered a variety of data on intakes along the Missouri River from Fort Peck Dam to the Montana-North Dakota border. The RCCD completed a report entitled "Inventory of Pumps and Intakes on the Missouri River Between the Fort Peck Dam and the North Dakota Border", February 19, 2002. Participation by pump owners in the inventory was very strong. The 143 pumps surveyed are believed to comprise the vast majority of pumps being used in the project area. Of the 143 pumps, 55 pumps were on the north side of the river and 87 pumps were on the south side. These pumps are used to irrigate 56,415 acres of cropland. The deliverables from this report include the data input forms used in the inventory as well as related photographs, AutoCAD products, and maps. The RCCD also provided an estimate of the number of pumps/intakes impacted at river discharges of 15,000 cfs to 70,000 cfs in 5,000 cfs increments. This estimate was not a deliverable required by the contract and did not include a detailed explanation of the criteria for determining impacts. Since a Fort Peck Dam release of 15,000 cfs is within the limits of the current water control plan, and since the maximum discharge for the mini test is 15,000 cfs, there is no evidence to indicate mini test impacts beyond normal operations. Therefore, these estimates of impacts were not considered relevant to this EA.

Directly across from the spillway

The water discharged from the spillway would enter the river at a different location than that normally discharged through the powerplant. Due to the direction and magnitude of this discharge, erosion is likely to occur directly across from the spillway which could impact water intakes servicing approximately 1,200 acres of irrigated farmland. The magnitude of the problem would be dependent on the extent of the erosion and the likelihood of temporarily or permanently relocating the water intakes. Although a potentially major loss to the landowner, the loss of irrigation at this site is not considered to be a significant impact on a regional or National basis.

* An issue raised during public scoping

Water Supply*

Missouri River intakes

The discharge required by the test is within normal flow levels experienced or exceeded every two or three years in this reach of the Missouri River. For this reason no abnormal impacts to existing or proposed municipal, rural water district, irrigation district, or to any individual irrigator or domestic intakes are anticipated as a result of the flow test. Turbidity levels are not expected to exceed normal levels, therefore treatment costs are not expected to increase significantly. With regard to the reduced amount of water stored at the reservoir, because of the limitations placed on the availability of water for discharge, no loss of water required for domestic water supply is anticipated.

Immediately downstream from the spillway

If the mini test proceeds without the construction of a preventative bank stabilization project (under the Corps' Section 33 program), then the erosion of up to 5 acres of land directly across from the spillway could temporarily increase turbidity levels in the vicinity of the spillway and immediately downstream from the spillway. There are irrigation intakes in the vicinity of the spillway (one across from the spillway, and two downstream from the Milk River), but no water supply intakes near the spillway or immediately downstream from the spillway. The temporary, localized increase in turbidity is not considered significant.

Environmental Justice Determination

The areas most impacted by the flow test are directly downstream from the spillway. The closest concentration of minority and low-income groups that could potentially be impacted by the proposed action are on the Fort Peck Reservation. This reservation is located on the left bank of the Missouri River, which serves as its southern boundary. The reservation starts approximately 5 miles below the dam and extends along the river a distance of about 80 miles. To the extent the reservation has a greater concentration of Native Americans than the state as a whole, the potential for disproportionate impacts to this minority group was evaluated. However, because no adverse bank erosion impacts are anticipated this far downstream as a result of the test, there would be no disproportionate impacts to minority or low-income groups.

The area most impacted by the flow test is directly across from the spillway. These impacts do not affect Roosevelt County or the Fort Peck Reservation. Since there are no adverse impacts in that county or on the Reservation, no disproportionate impacts to minority or low-income groups are anticipated.

Cultural Resources Impact Analysis

The Missouri River meanders considerably below Fort Peck Dam. High cutbanks exist on the outside bends of the river, and erosion in these areas is active. Assuming that the

Table 9 - Cultural Site Analysis

Site Number(s)	Site Description	NHRP	NHRP eligible	State	Not Impacted	Monitoring Recommended	Comments
24DW287 24RL204 24RL300 32MZ1174	Lower Yellowstone Irrigation Project		X	MT	X		
24MC1	bison processing site		X	MT	X		
24MC97	remnant of the Great Northern Wiota to Fort PEck railroad		X	MT	X		located 49 feet above water level
24MC29 24VL590	Fort Peck Dam	X		MT	X	spillway monitoring	includes powerhouse, spillway, intake tunnels, and gatehouses
24RL246	Carlisle bison processing site		X	MT	X		site already documented, but not relocated during 1992 inventory.
24RL247	Gallinger Ditch			MT	X		not eligible for NHRP
24RL248	two hearths, bison processing, foundation		X	MT	X		stabilized for erosion control
24RL86 24RL211	Snowden Bridge	X		MT	X		bridge is no longer in use
24RV50 32WI17	Fort Union Trading Post	X		MT	X		
24RV438	Lewis and Clark Bridge	X		MT	X		a.k.a. Wolf Point Bridge or Macon Bridge. Still in use.
24VL1345	historic material scatter and terraces			MT	X		not eligible for NHRP
24VL1686	barge and slipway structure		X	MT	X		
24MC401	Barge		X	MT	X		
24MC402	prehistoric site		X	MT	X	X	
24MC403	prehistoric site		X	MT	X		
32MZ58	Mondrian Tree Site		X	ND	X		Impacted by pipeline construction
	Fort Buford		X	ND	X		
32WI156	Buford-Trenton irrigation canal and pumping station		X	ND	X		
32WI904	House and associated outbuildings				X		House dates from 1908-1918 but not on original location. Moved.

annual erosion rate is directly correlated with annual flow volumes, then the proposed test releases would have no impact on the average annual erosion rate. Therefore, no increase in annual erosion rates is anticipated as a result of the mini test. Areas currently experiencing erosion would continue to have erosion with or without the mini test. Impacts of altered Missouri River flows on bank erosion rates are discussed in the "Cumulative Erosion Impacts Analysis" (U.S. Army Corps of Engineers, 1998 a, 1998 b and 1998 c).

Without additional erosion, there would be no anticipated impact to cultural sites along the riverbank (see Table 10). Therefore, no impacts to cultural sites or TCP's is expected as a result of the mini test. Concurrence letters from the Montana State Historical Preservation Officer (SHPO) and the North Dakota SHPO are included in Appendix D.

Tribal Issues Impact Analysis

The following are issues/concerns raised by the Fort Peck Tribes during the consultation process. The Fort Peck Tribe concerns address the full spectrum of the "mini test," "full-test," and "implementation." The issues/concerns mainly deal with the "full-test" and "implementation" but are listed as an indication of their concerns.

1. The Fort Peck Tribe states there has been no substantive consultation nor coordination on the "Fort Peck mini test" or the "Fort Peck full-test."

Corps update: The Omaha District of the Corps of Engineers' understanding of this issue is that the Corps has not provided "plans" of action for the issues the Tribe has raised. The Corps has met, listened, and addressed the concerns with the Tribe. The Corps has not decided on the appropriate plan for these concerns at this time. However, actions have been taken to investigate or address the Tribe's concerns.

2. The Corps of Engineers must provide the Tribe with a plan for protection of the intake site including related facilities in the flood plain of the Missouri River, a plan for mitigation and/or replacement of facilities stemming from the full-test, and any proposed change in operating procedures at Fort Peck Dam to accommodate a future, artificial spring rise. The plan for mitigation and/or replacement of facilities must address a mechanism for financing repairs and/or replacement of the intake and related facilities through funds available from the Corps of Engineers or Federal entities other than the entity established for the operation, maintenance, and replacement of the Fort Peck Reservation Rural Water System.

Corps update: Regarding protection of the intake for the Fort Peck Reservation Rural Water System, it is the Corps understanding that the details of the design for the intake are not available at this time, so an analysis of damage is not possible. However, based on our current knowledge, no overall damages to Tribe facilities from any of the flows is foreseen to be greater than the current operating plan.

3. The Corps of Engineers must likewise provide the Tribes with a plan for funding the additional costs of treating Missouri River water to remove enhanced levels of suspended solids at the water treatment plant for the Fort Peck Reservation Rural Water System.

Corps update: At this time, it is not known that treatment cost above the cost associated with the current river operating plan exist. The Fort Peck Tribes Total Sediment Transport Monitoring plan will be submitted to the Corps Strategic Planning Committee for consideration.

4. The Corps of Engineers must provide the Tribes with a plan for protection/mitigation/replacement/funding of existing intake sites along the north bank of the Missouri River for the Fort Peck Irrigation Project and for other intakes for irrigation or other purposes, including new tribally-proposed irrigation intakes, within the boundaries of the Reservation.

Corps update: The need to protect sites has not been established. The Corps has contracted for an inventory of pumps and intakes on the Missouri River below Fort Peck Dam with the Roosevelt County Conservation District. As a part of the "mini test" and "full-test," it is anticipated that revised river profiles will be established.

5. The Corps of Engineers must provide an analysis of the impact of the mini test, full-test, and any future operational changes at Fort Peck Dam on the erosion of the north or left bank of the Missouri River. The analysis should include the impact of future operations on the mechanisms of accretion and avulsion and the impact of future operations on changes in ownership that might be caused by movement of the banks or channels of the Missouri River. The analysis should also include the impact of future operations of the elevation of the bed of the River as a result of aggradation or degradation. The analysis should provide maps of the Missouri River Valley between the east and west boundaries of the Fort Peck Indian Reservation outlining the soil types, geologic anomalies and any other factors that will permit definition of areas more susceptible to erosion and areas less susceptible to erosion. The analysis must provide conclusions with respect to means of compensating landowners within the Fort Peck Indian Reservation for loss of land whether those landowners are the Tribes, allottees, or private owners.

Corps update: The Corps does not have knowledge of any overall long-term changes to the erosion on the Missouri River caused by the mini test. To address continued local interest groups and Tribe concerns, the Corps has added three erosion monitoring sites in addition to the existing system for evaluating erosion. A new aerial photograph of the Fort Peck reach of the Missouri River was taken in the fall of 2001. The U.S. Department of Agriculture (USDA), Agriculture Research Service (ARS) has performed some independent work and to our understanding has recently provided a report to the local Coordinated Resource Management Group (CRM). In regard to compensating landowners, the only known method of compensation is the Missouri River between Fort

Peck and Gavins Point Project (Section 33). Section 33 has provisions which may limit its applicability to the Tribe's concerns.

6. The Corps of Engineers must provide a plan for review by the governing body for assurances of safety during testing and future operations. The plan should address, among other things, the methods of notification and warning before and during testing or operating procedures to artificially produce a spring rise. The plan should acknowledge and address warning and safety procedures for cultural and spiritual ceremonialists, recreationists, landowners, wood gatherers, hunters, fishermen, and others, that would normally occupy the River, its banks, and its flood plain. The plan should also address the potential for rainfall and/or snow melt events in the Missouri River Basin above Fort Peck Dam, such as the 1948, 1952, and 1964 events, and a loss of flood control capability due to revised operational procedures to maintain reservoir levels at or near spillway elevations in the May/June period in order to accomplish the release of water from the spillway for an enhanced spring rise. The plan should also address any known concerns with regard to the capability of the spillway to perform properly during the mini test, the full-test, or during future operations.

Corps update: The Corps appreciates and acknowledges the concern for those people who are using the river during the "mini test." The releases will increase gradually. An outline for the draft safety plan has been developed and will be completed prior to the mini test. This safety plan will be finalized prior to implementation of the "mini test." The spillway is completely safe for all actions associated with the "mini test" and "full-test." To assess long term effects of future operations, an engineering consultant has completed preliminary instrument installation in the spillway. The consultant will do additional preliminary analysis and additional testing during the mini test and full-test.

7. The Corps of Engineers must provide a plan for review by the governing body for the protection of human remains, cultural, historical, and archeological resources known to exist in the Missouri River Valley and that may in the future be exposed by testing and/or future operating procedures.

Corps update: At this time, the Corps has no knowledge of any change to the impacts on human remains, cultural, historical, and archeological resources as a result of mini test actions. The Corps contracted with the Fort Peck Tribes for a Cultural Resources Inventory and Traditional Cultural Properties Inventory. Given the mini test will not be performed until June 2005 at the earliest, additional information may be available to determine the amount of monitoring of possible erosion of potential cultural sites necessary.

8. The Corps of Engineers must clearly present a report to the governing body on the benefits to the Tribes, their lands, and their resources of the proposed revisions in operations of Fort Peck Dam. The report must address economic, environmental, and cultural benefits.

Corps update: A report which addresses the benefits to the Tribe has not been provided, but the following are some of the benefits the Tribes can expect to receive:

Economic Benefits
The Tribes have a contract with the Corps to conduct Cultural Resources Inventory, Traditional Cultural Properties, and cottonwood forest surveys.

Environmental Benefits
The Tribes and public in general benefit from the protection to the pallid sturgeon, the least tern, and piping plover resulting from the Endangered Species Act (ESA). This protection may also benefit other native fish.

Cultural Benefits
Additional information will be available to the Tribe regarding Cultural Resources Inventory, Traditional Cultural Properties, and cottonwood forests surveys.

9. The report must also address the impact of the mini test, full-test, and any future operational changes on aquatic habitat, riparian habitat (with special attention on our cottonwood forest), endangered or threatened species and upon species that are not threatened or endangered.

Corps update: The Corps contracted with the Fort Peck Tribes to perform an initial cottonwood forest survey as a part of the Cultural Resources Inventory.

10. The report must address the impact of changes in operation of Fort Peck Dam on hydropower resources of the Eastern Division of Pick-Sloan and, more specifically, on the resource pool which the Fort Peck Assiniboine and Sioux Tribes will receive Federal power at preference rates beginning January 1, 2001. The report should provide the Tribes with an assessment of the financial impact of operational changes on the Tribes' hydropower allocation as well as the financial impact on the Tribes from any other positive or negative changes.

Corps update: This EA addresses general hydropower impacts associated with the mini test. It is our understanding that the mini test would not impact the Tribes' hydropower allotment, since Pick-Sloane allocations are generally based on firm kilowatt hours, not a percentage of the total produced.

11. The Corps of Engineers must prepare and present a detailed plan to establish field baseline conditions and thereafter to monitor changes in the field to the river banks, the river bed, suspended sediments, bedload, aquatic habitat, riparian habitat, and other resources and facilities. The plan should describe how changes caused by revised operating procedures will be determined (relative to historic operating procedures) and how those determinations of marginal changes will be used to define damages, mitigation requirements, and compensation. Independent investigations have been undertaken by the tribes on the increase in suspended sediments that may be expected as a result of the spring rise. Those investigations

conclude that a 7 percent increase in suspended sediment can be expected with a change in flows from the historic pattern to the proposed pattern with spring rise. This is of significant concern and interrelates with aggradation, degradation, bank erosion, riparian habitat, and other resources. The Tribes are willing to share this analysis with the Corps of Engineers given a showing of attention to our concerns.

Corps update: The Corps acknowledges the Tribal concern for the river and the associated environments. The Fort Peck Tribe's Total Sediment Transport Monitoring Plan proposal will be submitted to the Corps Strategic Planning Committee for consideration. New aerial photography of the Fort Peck reach of the Missouri River was taken in the fall of 2001. Other monitoring and data collection plans (e.g., fisheries, erosion, etc.) can be found in Appendix E.

Relationship between Short-term Uses and Long-term Productivity

The short-term use of 256,000 acre-feet of water from Fort Peck Lake for a mini test would have a temporary and insignificant effect on hydropower productivity. Water in the lake is a renewable resource dependent on precipitation. The effect of the mini test on long term productivity is insignificant.

Irreversible and Irretrievable Commitments of Resources

The impact analysis resulting from the commitment of water resources for the test is described above and is insignificant. The use of water for the mini test would be irretrievable for this water season, but is retrievable over time through precipitation.

In the absence of a bank stabilization structure across from the spillway, the potential for the direct erosion of up to 5 acres of farmland across from the spillway would be irretrievable for that site. If that site contains sands and other heavier materials, those could form islands or accretion lands at some unknown point downstream. Even so, the erosion would not be significant for the region.

Cumulative Impacts

This section discusses the cumulative or additive impacts and benefits of this mini test with reasonably foreseeable future actions, as well as past actions within the same general area.

There is a likelihood that a full test of flows involving a Fort Peck spillway discharge could occur in the near future, since the full test, like the mini test, is identified in the Opinion as a needed task. It is currently unknown on how these tests would influence future flow management out of Fort Peck Dam. The Master Manual addresses flow alternatives based on the data known to date, and future flow changes, if any, would be addressed through annual AOP meetings and coordination.

The cumulative effect of these actions, in addition to the mini test, could result in warmer Missouri River water during the month of June (and possibly continuing into the summer) during years with flow modifications. This could positively benefit the pallid sturgeon and potentially lead to natural spawning in the Missouri River below Fort Peck.

The cumulative effect of these same actions on native paddlefish, however, was an expressed concern and is unknown. Paddlefish have been tagged and will be monitored for movement to determine if the warmer water compels them to abandon the Yellowstone River (where they successfully spawn) and enter the Missouri River. The incremental temperature increase of the mini test is the smallest of the three actions, and it is not likely to alter paddlefish movement.

The cumulative effect of the flow modification actions on erosion rates is expected to be within the ranges of annual erosion. Erosion across from the spillway (in the absence of bank stabilization) could be locally important, but not a significant impact at the regional scale.

The cumulative effects of flow modification actions and the potential to affect recreation, especially that associated with the Lewis and Clark Bicentennial from 2004 - 2006, would depend on the timing of the flow modification actions. The mini test is scheduled in June of 2005 if sufficient water is available in Fort Peck Lake. However, if the drought continues, the mini test may not occur until after the bicentennial celebration. Prior to implementing the mini test, notice of the higher water would be given to boaters. The additional water could be a benefit for early summer river recreation.

Consistency with Other Public Plans and Documents

This section discloses the consistency of this mini test action with other existing plans and /or NEPA documents within the same general vicinity. In addition, and Environmental Checklist of compliance with State and Federal laws and Executive Orders can be found in Appendix G.

Document	Consistent	Not Consistent
Draft Master Manual	X	
Opinion	X	
Section 33 Bank Stabilization	X	
Annual Operation Plan 2003	X	
Fort Peck Master Plan	X	
Fort Peck Fish Hatchery Report	X	
Fort Peck Visitor Center	X	
Regional Water System for Fort Peck Tribes	X	

References

Braaten, P.J. and D. B. Fuller. 2003. Fort Peck flow modification biological data collection plan, 2002 Report prepared for the U.S. Army Corps of Engineers, Omaha District and the Montana Department of Fish, Wildlife, and Parks. Fort Peck, Montana.

Braaten, P.J. and D. B. Fuller. 2002. Fort Peck flow modification biological data collection plan, 2001 Report prepared for the U.S. Army Corps of Engineers, Omaha District and the Montana Department of Fish, Wildlife, and Parks. Fort Peck, Montana.

Bramblett, R.G. 1996. Habitats and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers, Montana and North Dakota. Doctoral dissertation, Montana State University, Bozeman.

Clancey, P. 1990. Fort Peck pallid sturgeon study. Report period: April 1, 1989 – December 31, 1989. Montana Department of Fish, Wildlife, and Parks, Helena.

Dieterman, D.J., M.P. Ruggles, M.L. Wildhaber, and D.L. Galat. 1996. Population structure and habitat use of benthic fishes along the Missouri and lower Yellowstone Rivers. 1996 Annual report of the Missouri River Benthic Fish Study PD-85-5832 to the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation.

Elliott, J.C. and Laris Systems, Inc. 2001. Missouri River Cottonwood Study, Fort Peck Reservation, Montana. Prepared for the Fort Peck Assiniboine and Sioux Tribes, Poplar, Montana. September, 2001.

Erickson, J.D. 1993. Habitat selection and movement of pallid sturgeon in Lake Sharpe, South Dakota. Master's thesis, South Dakota State University, Brookings.

Fort Peck Tribes, 2003. Fort Peck Reservation, Assiniboine and Sioux Tribes Survey of Traditional Cultural Propertie. Prepared by MR & I Water Pipeline Project, P.O. Box 1027, Poplar, Montana 59255

Galat, D.L., M.L. Wildhaber, and D.J. Dieterman. 2001. Spatial patterns of physical habitat. Volume 2. Population structure and habitat use of benthic fishes along the Missouri and lower Yellowstone rivers. U.S. Geological Survey, Cooperative Research Units, University of Missouri, 302 ABNR Bldg., Columbia, Missouri.

Gardner, W.M., and P.A. Stewart. 1987. The fishery of the lower Missouri River, Montana. Project FW-2-R, Job 1-b. Final Report. Montana Department of Fish, Wildlife, and Parks, Helena.

Gardner, W.M. 2000. Montana Department of Fish, Wildlife, and Parks unpublished data.

Jackson, J., D. Willis, and D. Fielder. 1993. Changes in walleye food habits throughout Lake Oahe, South Dakota, in August 1991. Prairie Naturalist 25:331-339.

Keasling, Robert. 2003. Personal communication. Northwestern Division Reservoir Control Center.

Kim, G.W. and D.R. DeVries. 2001. Adult fish predation on freshwater limnetic fish larvae: a mesocosm experiment. Transactions of the American Fisheries Society 130: 189-203.

Knight, R., F. Margraf, and R. Carline. 1984. Piscivory by walleyes and yellow perch in western Lake Erie. Transactions of the American Fisheries Society 113: 677-693.

Kynard, B., E. Henvey, and M. Horgan. 1998. Studies on pallid sturgeon. Progress report to the U.S. Fish and Wildlife Service, pallid sturgeon recovery team. U.S. Fish and Wildlife Service, Bismarck.

Liebelt, J.E. 1999. Lower Missouri River and Yellowstone River pallid sturgeon study. 1999 report, submitted to the Western Area Power Administration. Montana Dept of Fish, Wildlife, and Parks.

Liebelt, J.E. 1996. Lower Missouri River and Yellowstone River pallid sturgeon study. 1994 – 1995 report, submitted to the U.S. Bureau of Reclamation and Western Area Power Administration. Montana Department of Fish, Wildlife, and Parks, Helena.

Midwest International Inc., 1997. Fort Peck Project, Montana, Downstream Channel and Sediment Trends Study. Prepared for the U.S. Army Corps of Engineers, Omaha District Hydrologic Engineering Branch, Omaha Nebraska, February 1997.

National Academy of Sciences. 2002. The Missouri River Ecosystem: Exploring the Prospects for Recovery. Water Science and Technology Board, Division of Earth and Life Sciences, National Research Council. National Academy Press, Washington, D.C. January, 2002.

Paul, E. and A Peterson (eds). 1964. Collector's handbook to marks on porcelain and pottery. Modern Books and Crafts, Inc. Green Farms.

Porath, M. and E. Peters. 1997. Use of Walleye Relative Weights (Wr) to Assess Prey Availability. North American Journal of Fisheries Management 17:628-637.

Pouley, John O., James D. Strait, Blain Fandrich, and Lynelle Peterson, 2002. A Cultural Resources Inventory fo the Corps of Engineers Fort Peck Dam Flow Modification Project. Ethnoscience, 4140 King Ave East, Billings, Montana. Prepared for the Fort Peck Water Resources Office, Poplar, Montana, August 2002.

Roosevelt County Conservation District. 2001. Inventory of Pumps and Intakes on the Missouri River between Fort Peck Dam and the North Dakota Border. Final Report by the Roosevelt County Conservation District, Culbertson, Montana. Prepared for the U.S. Army Corps of Engineers, Omaha District. February, 2002.

Ruggles, M. 1997. Powerpoint presentation. Montana Fish, Wildlife, and Parks.

Tews, A. 1994. Pallid sturgeon and shovelnose sturgeon in the Missouri River from Fort Peck Dam to Lake Sakakawea and in the Yellowstone River from Intake to its mouth. Final Report. Submitted to the U.S. Army Corps of Engineers. Montana Department of Fish, Wildlife, and Parks, Helena.

Tews, A., and P. Clancey. 1993. Fort Peck pallid sturgeon study. Report period January 1, 1992 – December 31, 1992. Submitted to the U.S. Army Corps of Engineers. Montana Department of Fish, Wildlife, and Parks, Helena.

Toulouse, J.H. 1969. Bottle makers and their marks. Thomas Nelson Inc. New York.

U.S. Army Corps of Engineers. 2001a. Revised Draft Environmental Impact Statement, Master Water Control Manual, Missouri River, Volume 1 – Main Report. Northwestern Division, Missouri River Office, Omaha, Nebraska.

U.S. Army Corps of Engineers. 2001b AOP, Missouri River Main Stem System 2001 – 2001 Annual Operating Plan. October, 2001. Northwestern Division, Missouri River Office, Omaha, Nebraska.

U.S. Army Corps of Engineers, 2001c. Missouri River between Fort Peck Dam, Montana, and Gavins Point Dam, South Dakota and Nebraska (Section 33). Irrigation Site Protective Measures. Letter Report. Omaha District, May, 2001.

U.S. Army Corps of Engineers. 2001d. Missouri River between Fort Peck Dam, Montana and Gavins Point Dam, South Dakota and Nebraska (Section 33). Irrigation Site Protective Measures, Fort Peck Dam, Montana. Letter Report. Omaha District.

U.S. Army Corps of Engineers, 2000a. Annual Report, Water Quality Management Program, Omaha District Lake Project.

U.S. Army Corps of Engineers, 2000b. Fort Peck Spillway, Major Rehabilitation Study, Omaha District, August 2000.

U.S. Army Corps of Engineers, 1998a. Technical Report CHL098-X, Cumulative Erosion Impacts Analysis of the Missouri River Master Water Control Manual Review and Update Study, Waterways Experiment Station, Vicksburg, MS, March 1998.

U.S. Army Corps of Engineers, 1998b. Master Water Control Manual, Missouri River, Review and Update Study, Volume 10 - Cumulative Erosion Impacts Analysis. Northwestern Division, Missouri River Office, Omaha, NE, August 1998.

U.S. Army Corps of Engineers. 1993. Detailed Project Report. Missouri River between Fort Peck Dam, Montana, and Gavins Point Dam, South Dakota and Nebraska. Omaha District.

U.S. Army Corps of Engineers. 1992a. Design Memorandum MFP-105D. Master Plan - Missouri River Montana, Fort Peck Dam/Fort Peck Lake. Omaha District.

U.S. Army Corps of Engineers. 1992b. Environmental Assessment for Master Plan - Missouri River, Montana, Fort Peck Dam/Fort Peck Lake. Omaha District.

U.S. Department of Agriculture (USDA), Agricultural Research Service. 1999. Channel erosion on the Missouri River, Montana between Fort PEck Dam and the North Dakota border. Prepared for Coordinated Resource Management Group - Lower Missouri River CRM, Culbertson, Montana. May, 1999.

U.S. Fish and Wildlife Service. 2000. Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and the Operation of the Kansas River Reservoir System. November, 2000. Region 6, Denver, CO and Region 3, Fort Snelling, MN.

Yerk, D.B. and M.W. Baxter. 2001. Lower Missouri and Yellowstone Rivers pallid sturgeon study, 2001 report. Report submitted to Western Area Power Administration, Montana Fish, Wildlife, and Parks, Helena, MT.

The Fort Peck Tribes and Fort Peck Reservation. 2003. Assiniboine and Sioux Tribes Survey of Traditional Cultural Properties, 2003. Prepared by MR & I Water Pipeline Project, P.O. Box 1027, Poplar, Montana 59255

Pouley, John O., James D. Strait, Blain Fandrich, and Lynelle Peterson. 2002. A Cultural Resources Inventory for the Corps of Engineers Fort Peck Dam Flow Modification Project. Ethnoscience, 4140 King Ave East, Billings, Montana. Prepared for the Fort Peck Water Resources Office, Poplar, Montana. August 2002.