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# Environmental Assessment

## Byway Lakes Enhancement Project

Hell Canyon Ranger District, Black Hills National Forest  
Custer & Pennington Counties, South Dakota

T02S, R05E Sections 11  
T02S, R06E Sections 27, 28  
T03S, R05E Sections 15, 22



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## Commonly Used Acronyms and Abbreviations

<b>APE</b>	Area of Potential Effect	<b>FSR</b>	Forest Service Road
<b>AUM</b>	Animal Unit Months	<b>FY</b>	Fiscal Year
<b>BA</b>	Basal Area	<b>GIS</b>	Geographic Information Systems
<b>BABE, BA/BE</b>	Biological Assessment/Biological Evaluation	<b>HUC</b>	Hydrologic Unit Code
<b>BCC</b>	Birds of Conservation Concern	<b>IDT, ID Team</b>	Interdisciplinary Team
<b>BCR</b>	Bird Conservation Region	<b>LRMP</b>	Land and Resource Management Plan
<b>BHNF</b>	Black Hills National Forest	<b>MA</b>	Management Area
<b>BHNF LRMP</b>	Black Hills National Forest Revised Land and Resource Management Plan	<b>MBBH</b>	Monitoring Birds of the Black Hills
<b>BMP</b>	Best Management Practices	<b>MIS</b>	Management Indicator Species
<b>CDA</b>	Connected Disturbed Areas	<b>MPB</b>	Mountain Pine Beetle
<b>CEQ</b>	Council on Environmental Quality	<b>MVUM</b>	Motor Vehicle Use Map
<b>CFR</b>	Code of Federal Regulations	<b>NEPA</b>	National Environmental Policy Act
<b>CWD</b>	Coarse Woody Debris	<b>NFMA</b>	National Forest Management Act
<b>CWPP</b>	Community Wildfire Protection Plan	<b>NFS</b>	National Forest System
<b>DENR</b>	Department of Environment and Natural Resources	<b>NFSR</b>	National Forest System Road
<b>EA</b>	Environmental Assessment	<b>NHPA</b>	National Historic Preservation Act
<b>EPA</b>	Environmental Protection Agency	<b>NRHP</b>	National Register of Historic Places
<b>FDR</b>	Forest Development Road	<b>OHV</b>	Off Highway Vehicle
<b>FEMA</b>	Federal Emergency Management Agency	<b>R2</b>	Forest Service Region 2 (Rocky Mountain Region)
<b>FPS&amp;G</b>	Forest Plan Standards and Guidelines	<b>RIS</b>	Resource Information System
<b>FSM</b>	Forest Service Manual		

<b>RMBO</b>	Rocky Mountain Bird Observatory	<b>SUP</b>	Special Use Permit
<b>RMRS</b>	Rocky Mountain Research Station	<b>TES</b>	Threatened, Endangered, & Sensitive Species
<b>SD</b>	South Dakota	<b>THPO</b>	Tribal Historic Preservation Office
<b>SDDENR</b>	South Dakota Department of Environment and Natural Resources	<b>USC</b>	United States Code
<b>SDGFP</b>	South Dakota Game Fish and Parks	<b>USDA</b>	United States Department of Agriculture
<b>SDNHP</b>	South Dakota Natural Heritage Program	<b>USFS</b>	United States Department of Agriculture Forest Service
<b>SHPO</b>	State Historic Preservation Office	<b>USFWS</b>	United States Fish and Wildlife Service
<b>SHR</b>	Stream Health Rating	<b>USGS</b>	United States Geological Survey
<b>SIO</b>	Site Integrity Objective	<b>WCP</b>	Watershed Conservation Practice
<b>SOLC</b>	Species of Local Concern	<b>WIZ</b>	Water Influence Zone
<b>SOPA</b>	Schedule of Proposed Action	<b>WUI</b>	Wildland Urban Interface
<b>SS</b>	Structural Stage		





## SUMMARY

The Hell Canyon Ranger District of the Black Hills National Forest proposes to remove lake sediments from Horsethief, Lakota and Bismarck Lakes to improve water quality for fisheries and recreation (see Figure 1 or Map 1 in Appendix A). These three lakes would be drained during the fall of the year and their bottom sediment allowed to freeze. The sediment would then be excavated with heavy equipment and hauled to a sediment site. The lakes would be allowed to refill once the sediment is removed.

The Byway Lakes Enhancement project area consists of each lake (Horsethief, Lakota, and Bismarck Lakes) and their immediate shoreline acreage, the haul routes for trucking sediment from each lake, and the sediment deposit sites. Bismarck Lake is within Management Area 8.2, Developed Recreation Complexes. Lakota Lake and Horsethief Lake are both located within Management Area 5.4A, Norbeck Wildlife Preserve. The entire project area is within the Hell Canyon Ranger District of the Black Hills National Forest.

The focus of the purposed action is to remove sediment from Horsethief, Bismarck and Lakota Lakes to improve water quality for fisheries and recreation. This action is needed because all three lakes are experiencing loss of water quality due to excess lake sediment that has built up over the past 50-70+ years. Horsethief Lake currently does not meet the State of South Dakota water quality standards due to excess sediment containing naturally occurring phosphorus. This project would decrease the sediment load of all three lakes, increase the water quality, and provide opportunities to enhance fish habitat and improve recreational opportunities.

The proposed action was described in a scoping document (July 8, 2011) and mailed to approximately 62 individuals, tribal representatives, groups, government entities and other interested members of the public.

The Forest Service evaluated the following alternatives:

### **Alternative 1 - No Action**

The National Environmental Policy Act requires the study of the No Action Alternative as a basis for comparing effects of the proposed action and other alternatives. The No Action alternative assumes no implementation of any elements of the proposed action or other action alternatives would take place within the project area. This alternative represents no attempt to actively respond to the purpose and need for action or the issues identified during scoping. For example, there would be no effort to remediate existing sedimentation conditions in the project lakes, current Forest Service lakeside recreation site maintenance would continue, as well as, State of South Dakota water quality monitoring and fish stocking programs on National Forest lands.

### **Alternative 2 - Modified Proposed Action**

The Modified Proposed Action is designed to address the purpose and need for action and to address the key issues identified during scoping. The two key issues identified during scoping are 1) sediment disposal and 2) downstream water quality.

The proposed action would lower each lake's water level in the fall of the year. Water levels would be lowered as much as possible which would usually result in a very small pool of water left at the lowest point of each lake. While lakes are drained shoreline erosion areas would be repaired by placement of native rock and lake bottoms final shaped, contoured. The removal of sediment would occur during the winter months with an estimated refill of Horsethief Lake by the end of June and the other lakes 4-6 weeks earlier. Areas of no disturbance for wildlife protection

have been mapped at each lake and would not be dredged or disturbed. Restocking of the lakes would be accomplished by the State of South Dakota Department of Game, Fish and Parks when they are refilled.

The work of dredging each lake would be accomplished with heavy machinery to remove frozen sediment during the winter and to haul it to a nearby sediment storage sites. Erosion control methods would be applied to sediment sites as necessary such as compost matting, silt fencing or compost sock to control sediment erosion. After frozen sediments melt and dry the sediment sites would be re-contoured to the surrounding land topography and seeded with native vegetation the following growing season. Herbicide treatments would occur to control the spread of any invasive weeds until native vegetation becomes established.

Based upon the effects of the alternatives, the Responsible Official will decide:

- Whether or not to undertake sediment removal to improve water quality for recreation and fisheries at Horsethief, Bismarck and Lakota Lakes.
- Which actions are appropriate and under what conditions actions would take place.

# CHAPTER 1: INTRODUCTION

## Document Structure

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The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would generally be expected to result from the implementation of the proposed action and alternatives. This document is organized into five chapters:

**Chapter 1: Introduction** - This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposed action and the key issues identified.

**Chapter 2: Comparison of Alternatives, including the Proposed Action** - This section provides a more detailed description of the proposed action as well as alternatives. These alternatives were developed based on key issues raised by the public and other agencies. This chapter also includes a comparative summary of the alternatives and the expected environmental consequences associated with each.

**Chapter 3: Affected Environment and Environmental Consequences** - This section describes the expected environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area (i.e. Wildlife, Recreation). Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

**Chapter 4: Consultation and Coordination** - This section provides a list of preparers, agencies, and persons consulted during the development of the Environmental Assessment.

**Chapter 5: Literature Cited and Glossary**

**Appendices:** The appendices provide more detailed information to support the analyses presented in the Environmental Assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Hell Canyon Ranger District Office in Custer, South Dakota.

## Background

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The Black Hills National Forest has the responsibility to ensure quality outdoor recreation opportunities for current and future visitors. In 2009 the Hell Canyon Ranger District applied for a Federal Highway Administration National Scenic Byway Grant through the administering office of the State of South Dakota Department of Transportation to conduct environmental planning to consider removal of sediment from Horsethief, Bismarck and Lakota Lakes to improve water quality. Implementation to remove sediments from lakes in this project is dependent upon the outcome of the Byway Lakes Enhancement Project Environmental Assessment planning effort. These lakes are considered an important recreation resource for Byway travelers and the grant was awarded through the State of South Dakota Department of Transportation by the Federal Highway Administration in 2010. Matching grant monies for this project are being partly provided through cost sharing with cooperator South Dakota Department of Game, Fish and Parks on this project.

Bismarck, Lakota and Horsethief Lakes are all formed by dams and were built for the purpose of serving as recreational use lakes. Bismarck and Horsethief Lake dams were built during the 1920's – 1930's by the Civilian Conservation Corps for the purpose of providing a recreation resource for Black Hills visitors. They currently are the location for Forest Service developed recreation sites Horsethief Lake Campground and Day Use Fishing Area, Bismarck Lake Campground and Day Use Picnic Ground, and the organization Camp Bob Marshall. The Lakota Lake dam was constructed in the 1960's under former private ownership for the purpose of providing a recreation resource for a planned private resort that was never completed. This lake is the location of Lakota Lake Picnic Ground.

All three lakes are considered high-use public recreation sites on the Black Hills National Forest which is visited by thousands of recreation users every year. The summer months hold the highest concentration of use. These lakes are important recreational fisheries for Forest visitors and are stocked annually with trout by the State of South Dakota.

Bismarck, Lakota, and Horsethief Lakes were all formed by historic dams. Lakes formed by dams go through an "aging" process resulting in sediment build up. Sediments are transported by inlet streams into the lakes. Over time the lakes become filled in with sediment. None of these lakes have had sediment removed since their construction. Sediment sources from inlet streams and areas of disturbance were mostly from earlier times of poorly regulated mining, road building and logging and then exacerbated by the historic 1972 floods. Excess lake sediment can cause water quality issues such as increased water temperature and nutrient loading, shallow depths particularly at stream inlets and near shore areas, algae growth during warm periods, lack of dissolved oxygen in water important for fish survival, loss of quality fish habitat and rapid growth of shoreline vegetation which limits public access to the lake for recreation activity. All three project area lakes are experiencing loss of water quality issues from 50-70 years of sedimentation. Horsethief Lake also has sediment containing naturally occurring phosphorus which increases nutrient loading as it is released over time in lake water. As a result, Horsethief Lake is not meeting the State of South Dakota water quality standards.

The State of South Dakota conducted lake sediment surveys and collected data of all three lakes in 2009. Subsequent GIS mapping of this sediment data for this planning effort estimates sediment cubic yard quantities of 25,000 for Horsethief Lake, 24,000 for Bismarck Lake and 22,000 for Lakota Lake (see Appendix F for sediment data). In light of these conditions there is a need to reduce lake sediment to improve water quality for fisheries and recreation.

## **Location**

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The Byway Lakes Enhancement Project area is located in Custer and Pennington Counties, South Dakota (see Figure 1 or Map 1, Appendix A). Bismarck Lake is within Management Area 8.2, Developed Recreation Complexes. Lakota Lake and Horsethief Lake are both located within Management Area 5.4A, Norbeck Wildlife Preserve. The entire project area is within the Hell Canyon Ranger District of the Black Hills National Forest.

The project area consists of each lake (Horsethief, Lakota, and Bismarck Lakes) and their immediate shoreline acreage, the haul routes for trucking sediment from each lake, and the sediment deposit sites.

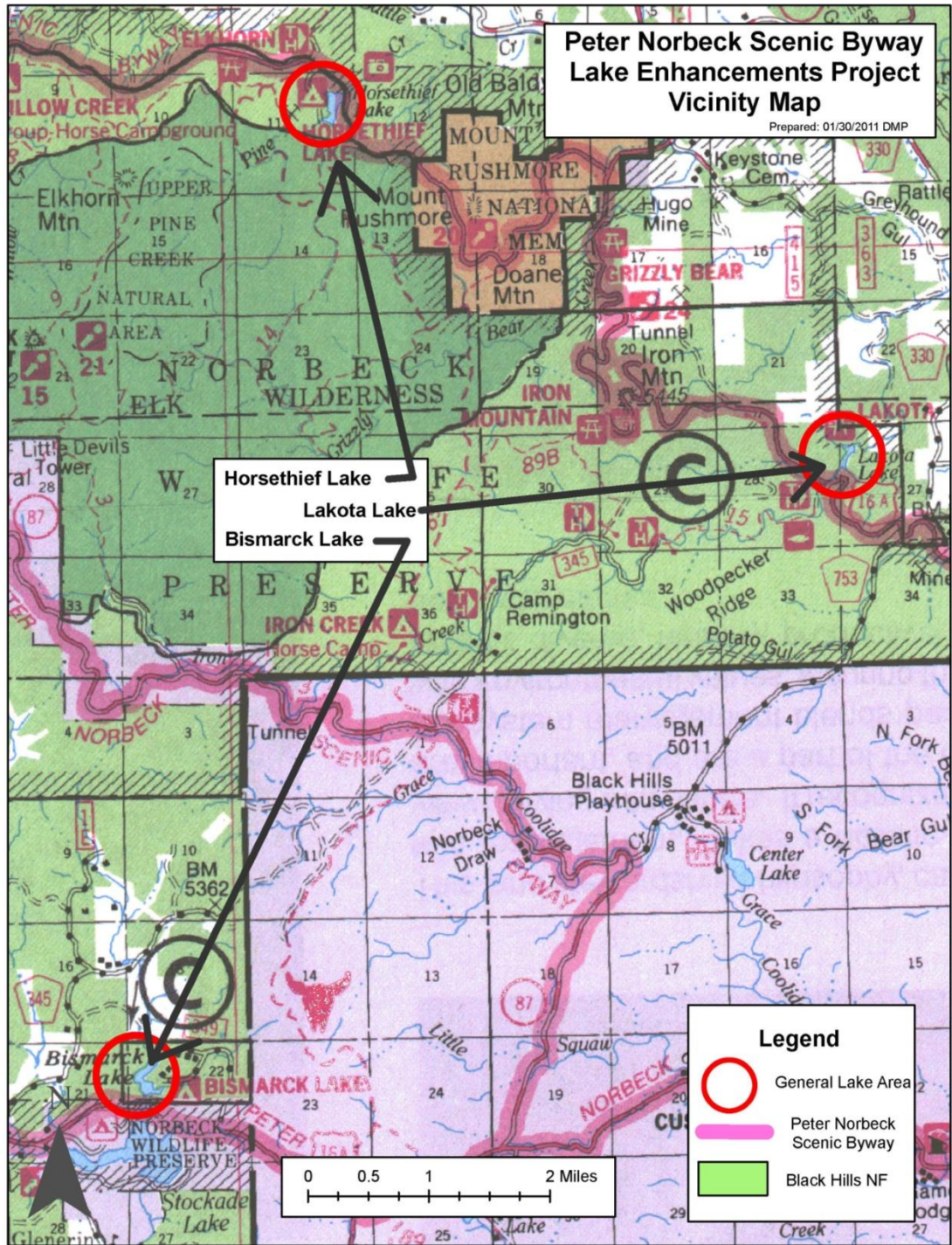


Figure 1. Byway Lakes Enhancement Project Vicinity Map

Each lake portion of the project area is discussed in more detail below.

**Horsethief Lake** is located approximately three miles east of Mt. Rushmore National Memorial on US Highway 244. The lake and its immediate shoreline covers 15 surface acres. There are two associated sediment deposit sites totaling 2.2 acres located within Pennington County, South Dakota, in T2S, R5E, Sections 11 & 2.

**Bismarck Lake** is located approximately ten miles east of Custer, SD and is accessed through Custer State Park on US Highway 16A. The lake and its immediate shoreline covers 24 surface acres. There would be one associated sediment deposit site totaling 1.8 acres located within Custer County, South Dakota, in T3S, R5E, Sections 15 & 22.

**Lakota Lake** is located approximately four miles south of Keystone, SD and accessed from Iron Mountain Road/US Highway 16A. The lake and its immediate shoreline covers 10 surface acres. There would be one associated sediment deposit site totaling 1.8 acres located within Custer County, South Dakota, in T2S, R6E, Sections 27 & 28.

There are several arterial roads proposed for hauling sediment which are included in the project area as follows: 0.75 mile of NFSR (National Forest System Road) 349 & 349.1A, 0.10 mile of NFSR 444, 0.70 mile of US Highway 244 and 0.60 mile of the Horsethief Lake unclassified utility maintenance road. All three lakes are located on the Peter Norbeck National Scenic Byway corridor.

## Management Direction ---

The 1997 Revised Land and Resource Management Plan (Forest Plan), as amended (the Record of Decision for the Phase II Forest Plan amendment was signed on October 31, 2005 and this direction became effective on February 28, 2006) provides direction for the management of the forest. The Forest Plan contains management Goals and Objectives, Management Area direction, and identifies desired future conditions for the forest. Resource specialists reviewed the current condition of the project area and compared these conditions with the desired conditions identified in the Forest Plan, as well as other applicable goals and objectives. Opportunities for improvement were identified.

The Forest Plan assigns a management emphasis to each portion of the Forest to meet multiple-use objectives. For each designated Management Area (MA) Chapter 3 of the Forest Plan includes descriptions of desired future conditions, goals, objectives, standards, and guidelines. The Byway Lakes Enhancement Project area contains three management area designations: MA 5.4A, Norbeck Wildlife Preserve, MA 8.2 Developed Recreation Complexes and MA 4.2B Peter Norbeck Scenic Byway. The 15 acres for Horsethief Lake sediment removal and 10 acres for Lakota Lake sediment removal is entirely in MA 5.4A. The 24 acres for Bismarck Lake sediment removal is entirely within MA 8.2.

**Management Area 5.4A, Norbeck Wildlife Preserve:** This area is managed to provide habitat for game animals and birds. Some human activities are allowed, consistent with wildlife needs.

**Management Area 8.2, Developed Recreation Complexes:** These areas are managed for recreational opportunities and visual qualities adjacent to developed recreation sites and bodies of water.

**Management Area 4.2B, Peter Norbeck Scenic Byway:** This area is managed to emphasize visually appealing landscapes in roaded settings, while meeting overall wildlife objectives for the Norbeck Wildlife Preserve.

Goals and objectives within the Forest Plan, as amended by Phase II, were used to develop the proposal for the Byway Lakes Enhancement Project.

**Goal 1:** "Protect basic soil, air, water and cave resources."

**Objective 103:** Maintain or improve long-term stream health. Achieve and maintain the integrity of aquatic ecosystems to provide stream-channel stability and aquatic habitats for water quality in accordance with state standards.

**Objective 104:** Maintain or enhance watershed conditions to foster favorable soil relationships and water quality.

- a. Implement projects to improve watershed conditions on an average of at least 300 acres annually over the plan period.
- b. Achieve and maintain stable stream beds and banks, diverse riparian vegetation and effective ground cover that controls runoff and erosion.

**Objective 106:** Manage water-use facilities to prevent gully erosion of slopes and to prevent sediment and bank damage to streams.

**Goal 4:** “Provide for scenic quality, a range of recreational opportunities, and protection of heritage resources in response to the needs of the Black Hills National Forest visitors and local communities.”

**Objective 40:** Review all existing projects and areas that do not meet the adopted Scenic Integrity Objective (SIO) specified for each management area, and set priorities for rehabilitation.

**Goal 7:** “Emphasize cooperation with individuals, organizations and other agencies while coordinating planning and project implementation.”

**Objective 701:** Continue to cooperate with interested parties and organizations in the development of plans and projects.

**Objective 703:** Seek partnerships with other service providers – federal, state, county, local and private sector – to define complementary roles that best meet customer needs.

## **Purpose and Need for Action**

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The purpose for action in the Byway Lakes Enhancement Project area is to improve water quality in Horsethief, Bismarck and Lakota Lakes for recreation and fisheries. Over the 50-70 year lifespan of these dammed lakes, sedimentation has caused a decline in water quality. Water depth has decreased, water temperatures have become warmer, near shore areas have become choked with mostly cattails which are preventing public access; water is more nutrient laden, prone to algae blooms, and habitat for fish survival has declined. There is an overall decline of the quality environment for lakeshore recreation activities such as fishing, picnicking, and canoeing. These resource conditions could worsen over time as the lakes continue to accumulate sediment negatively affecting the quality of experience for future visitors to the Black Hills, as well as, the ability to provide quality fisheries.

This action responds to the goals and objectives outlined in the Black Hills National Forest Forest Plan and would move the project area toward desired conditions described in that plan (USDA Forest Service 2006).

## **Proposed Action**

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The proposed action would lower each lake’s water level in the fall of the year. Water levels would be lowered as much as possible which would usually result in a very small pool of water left at the lowest point of each lake. The removal of sediment, also called dredging, would occur during the winter months when sediments are frozen. Some shoreline areas of no disturbance for

wildlife protection have been mapped for each lake and would not be dredged. After dredging and while still drained, lake bottoms would be final contour-shaped and shoreline erosion areas would be repaired by placement of native rock. Refilling lakes would occur from spring snow melt and precipitation. Based on hydrologic data estimates, Horsethief Lake would be full of water by the end of June and Lakota and Bismarck Lakes 4-6 weeks earlier. Restocking of the lakes would be accomplished by the State of South Dakota Department of Game, Fish and Parks.

The work of dredging each lake would be accomplished with heavy machinery to remove sediment and haul it to nearby sediment site(s). Erosion control methods such as silt fencing, compost matting and compost socks would be placed on the sediment site as necessary to control erosion. After sediments melt and dry, also called de-water, the sediment sites would be re-contoured by machinery to match the surrounding land topography. After contouring, the sediment site would be reclaimed and seeded with native vegetation for the next growing season. Herbicide treatments would occur as necessary to control the spread of invasive weeds until native vegetation becomes established. As proposed, sediment sites would limit transportation hauling of sediments on paved public roads to 0.70 mile and require no new road construction..

This action responds to the goals and objectives outlined in the Forest Plan and would move the project area toward the desired conditions described in that plan.

## **Decision Framework**

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Given the purpose and need, the deciding official (District Ranger) will review the proposed action, the issues identified during scoping, the other alternatives, the environmental consequences of implementing each alternative, and comments received from public scoping. After careful consideration of this information, the District Ranger will decide the following:

- Whether or not to undertake sediment removal from the Byway Lakes.
- Determining which actions are appropriate and under what conditions actions would take place.

## **Public Involvement**

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The original proposal was listed in the Schedule of Proposed Actions in April 2012. The proposal was provided to the public and other agencies for comment during scoping on July 8, 2011. As part of the public involvement process the Forest Service mailed a detailed scoping document to approximately 62 individuals, groups, tribal representatives, government agencies, and other interested members of the public. Federal, state, local, and Tribal governments and interested parties provided input during scoping efforts. South Dakota Game, Fish, and Parks (SDGFP) personnel joined members of the Interdisciplinary Team (IDT) in an initial planning meeting held in December 2010 and on a field review of the project area in March 2013.

Using the comments received during the scoping period, key issues were identified. All scoping comments received and the Forest Service response to those comments is available in the Byway Lakes Enhancement Project record, located at the Hell Canyon District Office in Custer, SD.

## **Issues**

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Comments received during the scoping process raised various issues in relation to management activities in the Byway Lakes Enhancement Project area. A total of 10 individuals, groups and agencies provided scoping input. From these comments and other sources, the project IDT identified two key issues that drove the development of the alternatives. A brief description of the two issues follows:



**Key Issue #1: Sediment Disposal**

Some commentors were concerned that the sites for sediment disposal and the methods used to transport sediment to the disposal sites could affect other resources including scenery, wildlife, vegetation, wetlands, water quality and recreation.

This issue is addressed by modifying the proposed action, Alternative 2. One modification is to not use the back sides of the lake dams for sediment disposal. Not using the backside of the lake dams would eliminate the potential effects of sediment soil eroding into more sensitive riparian areas located at the bottom of the back side of lake dams. It would also eliminate the effects to public traffic on the narrow section of US Highway 244 which crosses Horsethief Lake Dam where sediment hauling trucks would have had to stop, maneuver and then unload. There would also be no need for new road building to access the backside of Lakota Lake Dam.

Locating the proposed sediment deposit sites to areas reasonably close to each lake being dredged would minimize the truck hauling of removed sediment on paved roads to 0.70 miles on US Highway 244. This would minimize potential conflicts with public highway travelers and not disturb areas of the forest with new road building. All other roads totaling 1.43 miles are existing native or gravel surface roads that are either closed to the public year round, closed normally at the end of the developed recreation season or could be closed during the low public use winter period when the project activities would occur.

Another modification that addresses this issue is to not use the removed lake sediment for use at other project locations, such as mine reclamations or highway projects. Doing so would have been too ambiguous and it would not have been possible to analyze the effects for sediment use in unidentified “potential” projects located outside of the Byway Lakes Enhancement Project area.

**Measurement indicator:** Location and acreage of sediment sites, cubic yard estimate of sediments removed, feet of shoreline erosion repair, acreage and number of shoreline wildlife exclusion areas, route identification and mileage for sediment hauling, months of year for project implementation, estimated dates for refilling lakes.

**Key Issue #2: Downstream Water Quality**

Some commentors were concerned that this project could negatively impact water quality by increasing sediments to downstream water resources or affecting downstream flows during construction.

This issue is partly addressed by modifying the proposed action, Alternative 2, to address Issue #1, by not using the back sides of the lake dams for sediment deposit sites and by not considering the use of removed lake sediment for other projects, such as mine reclamation or highway projects. By not considering the use of removed lake sediment at other project locations, such as mine reclamation or highway projects reduces the potential impacts to downstream water resources elsewhere. Use of the removed sediment outside of the project area would have been ambiguous and it would not have been possible to analyze the effects for sediment use in unidentified “potential” projects.

Not considering the backside of the lake dams as sediment deposit sites eliminates the potential of dredged material entering downstream waters located at lake outlets. There are no downstream waters located directly below proposed sediment deposit sites needed for this project, with the exception of Lakota Lake where effective erosion control measures would be implemented.

This issue is also addressed through the project design criteria. Downstream water quality would be protected during the drawing down of lake water levels by the use of dam valves or if necessary gravity siphon pipes in the event that mechanical valves are not working. Dam valves would be used to control the water discharge to the minimum necessary. This would help decrease any lake bottom sediment from become mobile and would reduce effects to the

downstream water quality. The siphon pipe method draws water from the top most layers of the lake which contain no sediment. The siphon pipe is positioned, sized and adjusted to prevent outlet water from creating downstream erosion/sedimentation. Plastic piping would be temporarily be placed from lake inlet streams to each lake outlet, to maintain water flow and prevent downstream sedimentation during implementation. Appropriate state and federal permits, such as a General Permit for Storm Water Discharge Associated with Construction Activities and Clean Water Act section 404 permits, would be applied for and received prior to ground disturbing activities.

**Measurement indicator:** Location – topography of sediment sites, distance to downstream water resources from sediment site, project engineering design for downstream water quality protection.

## **CHAPTER 2: COMPARISON OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION**

This chapter describes and compares the alternatives considered for the Byway Lakes Enhancement Project. This section includes a description of each alternative considered in detail, including the No Action alternative (Alternative 1) and the Proposed Action (Alternative 2 Modified), as well as alternatives not considered in detail. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

### **Alternatives Considered in Detail**

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The Forest Service developed two alternatives; Alternative 1 - No Action and Alternative 2- Modified Proposed Action. The alternatives considered in detail by the IDT are discussed below. This section provides a summary of activities proposed to occur during implementation of any action alternative. Exact figures such as acres, miles, or other numerical units of any particular activity may vary slightly. These figures, which are based on inventory and survey estimates, may vary during preparation of project activities based upon various site factors such as topography, non-uniform site structure, soil conditions, etc.

#### **Alternative 1 – No Action**

The National Environmental Policy Act (NEPA) requires the study of the No Action Alternative as a basis for comparing the effects of no action to effects from the action alternatives. The No Action Alternative assumes no implementation of any element of the action alternatives within the Byway Lakes Enhancement project area. Current management plans would continue to guide management of the project area. This alternative represents no attempt to actively respond to the purpose and need for action or the issues presented during scoping. No effort would be made to modify existing water quality issues caused by sedimentation within the project area.

#### **Alternative 2 – Modified Proposed Action**

This alternative was developed to meet the purpose and need for action and represents the agency's recommendations after public scoping. The Modified Proposed Action proposes to remove sediment from Bismarck, Lakota and Horsethief Lakes to improve water quality for fisheries and recreation.

It is proposed that the project lakes would be drained and dredged over a two winter time period allowing some lake(s) to remain full of water every winter. Each lake would be drained after Labor Day weekend. Horsethief Lake is proposed to be drained and dredged in the fall/winter of 2013-14. Horsethief Lake is proposed as the first priority because it is listed by the State of South Dakota as failing to meet water quality standards due to excess nutrients, primarily naturally occurring phosphorous, which is stored in the lake sediments. Bismarck and Lakota Lakes would be drained and dredged in the fall/winter of 2014-15. Staggering the lakes between two successive years would allow fall/winter recreation activity such as hiking, nature photography and ice fishing to occur on the lakes not being dredged. Lake dredging would occur during the recreation off-season when recreation sites are closed. To avoid disrupting the highly concentrated summer recreation use, re-filling of the lakes would begin prior to the start of the primary recreation season beginning May 15th of each year. Based on 35 years of stream flow data from Grace Coolidge Creek located in Custer State Park it is estimated Horsethief Lake

would be refilled by the end of June, Lakota Lake by the first week of April and Bismarck Lake by the first week of June.

Draining the lakes would be accomplished by opening the dam valves to allow outflow of water from the bottom of each lake to outlet streams. Valve opening is done in a slow, deliberate and controlled process to prevent disturbance of bottom sediments. If efforts are not successful at opening dam valves due to mechanical problems then lakes would be drained by the use of a gravity flow siphon pipe placed over the dam face for outflow to the outlet stream. A bypass pipe would convey stream inflow through the dewatered lakes to minimize sediment mobilization and to maintain downstream water quality and beneficial uses.

This alternative would remove up to an estimated 71,000 cubic yards of bottom sediments from all three lakes. This estimate is based on data from a detailed lake bottom sediment survey conducted by the South Dakota Game, Fish and Parks Department in winter, 2009. This total includes approximately 25,000 cubic yards (cyds) from Horsethief Lake, 24,000 cyds from Bismarck Lake, and 22,000 cyds from Lakota Lake. The actual volume of sediment removed will be dependent on factors such as: the ability of construction trucks to access all areas of each drained lake which is dependent on lake bottom terrain as well any presence of any remaining pool(s) of water; frozen lake bottom conditions which is dependent on weather; possibly more or less sediment deposited and in different locations since the 2009 SD Game, Fish and Parks sediment survey; and ability to effectively drain each lake which is dependent on successful mechanical operation of valves and/or siphon pipes.

After draining, the exposed sediment would be allowed to freeze. During the winter months heavy machinery would be utilized to remove (dredge) the frozen sediment from the lake bottom. The sediment would be transported by truck to nearby sediment disposal sites.

Horsethief Lake would have two sediment deposit sites totaling 2.2 acres. One of these sites is a 1 acre forest opening located on the north side of US Highway 244 and the other 1.2 acre site is an abandoned gravel borrow pit located south of US Highway 244. The borrow pit sediment deposit site is located behind a locked gate and is accessed by a 0.60 mile native surface road off of US Highway 244. There would be no need for road construction to access this deposit site. The existing road is administrative use only to maintain Horsethief Lake Campground utilities, mainly the water cistern, the water system control and supply lines and electric line. Approximately 1,000 feet of this administrative use road and a portion of the borrow pit are also used as the trail tread for the non-motorized Centennial Trail 89. This trail section would be permanently relocated off of the existing road for approximately 1,000 feet in length because sediment would be placed in the borrow pit obliterating the existing trail tread. The new trail tread would not require timber cutting and would be built for horse and human foot traffic to a primitive trail class 3 standard (4 feet wide, grades less than 6%, native surface). This work would be accomplished by the Forest Service using non-mechanized hand tools. Approximately 50-75 non-commercial sized (< 9" diameter at breast height) conifer trees growing along the perimeter of the borrow pit opening and 2-3 conifer trees in the commercial size range (15-17" diameter at breast height) located in the borrow pit itself would be removed. The larger trees would be cut and anchored into the Horsethief Lake shoreline to improve amphibian habitat. The small trees would be chipped and piled nearby for mulching sediment soil during reclamation or added to the nearby slash pile left over from the Palmer Timber Sale, if it still exists, during project implementation.

The second Horsethief Lake sediment deposit site is a meadow which is accessed directly from the edge of US Highway 244 with no need for new road construction. The sediments would be placed on the western side of the meadow and cover approximately one acre in size. An area of non-commercial (< 9" diameter at breast height) conifer tree encroachment around the edge of the meadow would be cut, chipped and piled nearby for mulching sediment soil during reclamation.

This meadow's vegetation is mostly non-native Brome grass which would be planted with native species as part of reclamation of the site. Horsethief Lake sediment deposit sites are not located near any wetlands, streams or other bodies of water.

Bismarck Lake would have one 1.8 acre sediment deposit site. This site is an abandoned borrow gravel pit that is located across from the Camp Bob Marshall sewage lagoon. Access to this site is along Camp Bob Marshall road, FSR 349 & 349.1A for approximately 0.75 mile. The Bismarck Lake sediment deposit site is not located near any wetlands, streams or other bodies of water.

Lakota Lake would have a 1.8 acre sediment deposit site located in a pine encroached meadow beside the day use picnic area parking area. The proposed sediment deposit site is near the lake but buffered from the lake by a thickly matted meadow. To minimize erosion and protect water quality, design criteria such as compost matting, silt fencing, compost socks, seeding of native vegetation, and mulching would be applied until the newly planted vegetation becomes established. This sediment deposit site is a mechanically cut landform suspected to have been used to provide fill for building the Lakota Lake dam. As such it has a half-bowl shape which would buffer it from public view and be a non-complex site for effective sediment erosion control. Access is along the recreation site road FSR444 (parking lot) and is approximately 0.10 mile from the lake.

Lakota and Bismarck Lake sediment deposit sites both have non-commercial (< 9" diameter at breast height) conifer encroachment in them which would be cut, chipped and piled nearby for mulching sediment soil during reclamation. Neither site requires any road construction.

After placing sediment in the deposit sites erosion control methods such as silt fencing, mulch, compost socks, and compost matting would be utilized to protect water quality from each sediment deposit site to minimize erosion and sediment movement to water bodies. After drying, each sediment deposit site would be re-contoured with machinery and planted with native vegetation during the following year growing season. Herbicide treatments would be applied to control the spread of any invasive weeds until native vegetation becomes established.

Areas of exclusion, or no disturbance, have been mapped for each lake for wildlife protection, sensitive species protection, riparian/wetland habitat protection and to minimize shore line slumping. These near shore areas would not be dredged. The wildlife exclusions represent four locations totaling 0.65 total acres for Bismarck Lake, two areas totaling 1.63 acres for Lakota Lake and one area totaling 0.31 acre for Horsethief Lake.

In addition to sediment removal, this project would repair areas of shoreline bank erosion by placement of native rock (rip rap) while each lake is drained. Large wood and other structures may be placed to enhance aquatic and shoreline habitat. Shoreline erosion has been caused in the past by heavy foot traffic from recreation visitors and wave action undercutting shoreline banks. More effective and permanent erosion repair using native rocks placed at the shoreline of these heavy public use areas can be accomplished while the lake water levels are drawn down on all three lakes. Shoreline erosion repair would involve approximately 1,000 feet at Horsethief Lake, 250 feet at Bismarck Lake and 500 feet at Lakota Lake.

While the lakes are drained additional work could be accomplished, depending on availability of resources, to place structures on lake bottoms to provide fish habitat or along shorelines to provide amphibian habitat. Examples include placing turtle logs along shorelines or lake bottom fish cribs to provide fish cover.

Appropriate state and federal permits, such as a General Permit for Storm Water Discharge Associated with Construction Activities and Clean Water Act section 404 permits, would be applied for and received prior to ground disturbing activities.

## Design Criteria

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Design criteria include Forest Plan standards and guidelines, USFS Region 2 Watershed Conservation Practices (WCPs), Best Management Practices (BMPs) and site specific design to avoid resource impacts. They are applicable and to be implemented as a matter of standard operating procedures for the action alternative. Design criteria are applied to protect resources and forest users. All activities proposed in this project must implement these design criteria. A complete list of project design criteria is available in Appendix B.

## Alternatives Not Considered in Detail

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Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives, and to briefly discuss reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the proposed action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of the project, duplicative of the alternatives considered in detail, or determined to be components that would cause unnecessary environmental harm. Therefore, the following alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

- Alternative 2 – Original Proposed Action. The original proposed action would have implemented dredging and sediment removal as described above but included the backside of dams as sediment deposit sites and considered the use of sediments for other projects located elsewhere such as mine reclamation or highway projects. The use of the backside of dams for sediment storage was found to not be necessary as other more favorable sites with fewer effects to natural resources for this project were found during project planning. The use of the back side of lake dams would have created a number of potential challenges as sediment sites including transportation (hauling, construction activity & road building), presence of nearby sensitive streams and their associated flora and fauna located below dam faces, more complex erosion control and construction activity on steeper dam slopes. It was found to be too ambiguous and would not have been possible to analyze the effects for sediment disposal elsewhere for other, unidentified projects.
- Alternative to consider excluding sediment sites from the Norbeck Wildlife Preserve. Some commentors suggested that sediment disposal within the Norbeck Wildlife Preserve would negatively impact game animals and birds, and therefore sediment sites should be located outside of the Preserve. This alternative was considered but deferred from detailed analysis because suitable disposal sites were identified within the Norbeck Wildlife Preserve which could benefit or maintain habitat for game animals and birds. For example, proposed sediment deposit sites within the Norbeck Wildlife Preserve would reclaim a gravel pit near Horsethief Lake and remove pine encroachment from meadows near Lakota Lake and Horsethief Lake. From public comments, the effect of hauling large quantities of sediments on public roads was a concern. Due to the location of the project lakes within the boundaries of the Norbeck Wildlife Preserve an alternative to haul sediments outside of Norbeck would have meant greater impacts to public roads, recreation travelers, safety and vehicle traffic.

## Comparison of Alternatives

This section provides a comparison of the alternatives. Appendix A, Maps 2-4, provide a visual display of where activities are proposed. The environmental consequences of the alternatives are described in detail in Chapter 3 of this Environmental Assessment (EA).

**Table 1: Comparison of Alternative 1-No Action and Alternative 2-Modified Proposed Action**

	Total Surface Acres of Lake	Estimated Sediment Removed (cubic yards)	Sediment Haul Miles/Miles on Public Paved Roads	Sediment Sites: # of sites/acres	Wildlife Exclusions: # of exclusions/acres	Shore Erosion Repair (feet)	Estimated Date of Lake Refill
<b>Horsethief Lake</b>							
Alt. 1	15	0	0	0	0	0	N/A
Alt. 2	15	25,000	1.3/0.70	2/2.2	1/0.32	940	End of June
<b>Bismarck Lake</b>							
Alt. 1	24	0	0	0	0	0	N/A
Alt. 2	24	24,000	0.75/00	1/1.8	4/0.6	221	1 <sup>st</sup> Week of June
<b>Lakota Lake</b>							
Alt. 1	10	0	0	0	0	0	N/A
Alt. 2	10	22,000	0.10/00	1/1.8	2/1.70	521	1 <sup>st</sup> Week of April

## CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the environment of the affected project area and the potential changes to those environments due to the implementation of the alternatives. Relevant resource descriptions of the existing condition and the environmental consequences of each alternative are presented here. It also presents the scientific and analytical basis for comparison of alternatives presented in Chapter 2. For the purposes of this analysis and under federal regulations, “impacts” and “effects” are assumed to have the same meaning and are interchangeable.

The information presented here is based on analysis prepared by resource specialists from the interdisciplinary team (IDT). Analysis was accomplished by field observations and surveys, past experience and professional recommendation, aerial photography, resource modeling, literature review, information obtained through monitoring, Forest Plan direction and associated analysis, and public participation. The specialist reports are included in the project file, which is located at the Black Hills National Forest, Hell Canyon Ranger District, 330 Mt. Rushmore Rd., Custer, South Dakota. All resource specialists used the best available science in completing their analysis, in accordance with Forest Service Manual (FSM) 1920.

### Past, Present, and Reasonably Foreseeable Actions

Analysis of cumulative effects includes past, present, and reasonably foreseeable future activities that could affect the biological or social environments. See Appendix E for a listing of past, present and future activities considered in the Byway Lakes Enhancement Project cumulative effects analysis. The cumulative effects analysis area is bounded in space as the project area for all resources except for fisheries which includes the streams and Stockade Lake immediately downstream of the project lakes. Rationale for cumulative effects boundaries is noted in the cumulative effects discussions by resource.

## Hydrology and Fisheries

### Affected Environment

There are no natural lakes in the Black Hills (Stewart & Thilenius 1964). Bismarck and Horsethief Lakes were constructed in the late 1930s and Lakota Lake was completed in the 1960s. Horsethief and Lakota dams impound Pine Creek and Iron Creek, respectively. Bismarck Dam impounds Bismarck Creek. Immediately downstream of Bismarck Lake is Stockade Lake which is in Custer State Park. See Table 2 below for lake and watershed statistics and Maps 5-7 in Appendix A, that display the watersheds for the lakes. The lacustrine wetlands are manmade and were formed when the dams were built and water was ponded. None of the wetlands are identified as fens.

**Table 2: Comparison of Project Lakes**

Lake	Lake Acres <sup>1</sup>	Watershed Acres <sup>2</sup>	Avg. Annual Watershed Yield Acre-Feet <sup>3</sup>	Avg. Lake Depth Feet <sup>4</sup>	Estimated Lake Volume Acre-Feet <sup>5</sup>	Wetland Acres <sup>6</sup>
Horsethief	15.1	1,842	482	17.0	274	16.1
Lakota	10.2	8,060	2,100	11.8	117	8.7
Bismarck	24.2	2,508	650	9.7	223	22.5

<sup>1</sup>Calculated from digitizing aerial photos

<sup>2</sup>SD DENR 2010



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<sup>3</sup>SD DENR 2010 for Horsethief Lake, extrapolated for Lakota and Bismarck Lakes<sup>4</sup>Horsethief Lake-calculated from Bathometric Map, Lakota Lake-SDGFP 2007, & Bismarck Lake-SD Lake Finder 2013<sup>5</sup>Calculated by taking lake acres and multiplying average lake depth<sup>6</sup>USDI FWS 1995

Bismarck, Horsethief and Lakota Lakes were constructed to provide recreational fishing opportunities along with other recreation uses. These recreational fisheries are supported by non-native gamefish. The South Dakota Game, Fish and Parks department (SDGFP) annually stocks rainbow trout at multiple times throughout the open-water recreation season to satisfy angling expectations at these high-use developed recreation sites. Other non-native gamefish species, such as green sunfish, northern pike and yellow perch have been introduced illegally. The catch of trout from Horsethief Lake was the second lowest of six lakes sampled in 2007 (SDGFP 2008). The abundance of green sunfish in Horsethief Lake may have interacted with the trout catch by reducing it by some unknown extent (SDGFP 2008). The presence of northern pike in Lakota Lake became known in April 1997 from angler reports (SDGFP 2007). Recent fish surveys in these lakes have not documented any native fish species (SDGFP 2006a, SDGFP 2007, J. Carreiro personal communication).

The SDGFP surveyed Pine Creek and Iron Creek in 2009, both upstream and downstream of the project lakes (SDGFP 2010). Iron Creek, downstream, yielded creek chubs, longnose dace, and white suckers. Iron Creek, upstream, yielded longnose dace and brook trout. The previous upstream survey in July 1993 yielded brook trout, rainbow trout and longnose dace. Fish surveys in Pine Creek upstream and downstream of Horsethief Lake in May 2009 yielded no fish. Similar results occurred during the survey of the upstream site in July 1994; however, the previous survey of the downstream site yielded brook trout and fathead minnows (SDGFP 2009). Portions of Iron Creek dried up in 2012 due to drought conditions. Limited suitable fish habitat exists in Bismarck Creek, upstream of the lake.

Hillslope and streambank erosion and the transport of that sediment downstream is a normal hydrologic process. Dams function as sediment traps, especially in the case of these three dams where releases occur over a spillway rather than through an outlet pipe at the bottom of the reservoir. During dry years or wintertime conditions, lake levels may drop below the spillway crest. Flows downstream of the dam are maintained by seepage through the valve outlet works and/or accretion flows downstream of the dams. In the case of Bismarck Lake, several small ponds occur on the northside of Highway 16A and Stockade Lake. Photos of the outlet works and stream conditions below the dam are shown in Appendix A.

Over time, all three of these dams have trapped sediment. In 1988, the South Dakota Department of Environment and Natural Resources (SD DENR) prepared a report for the Forest Service evaluating the need to dredge a number of small lakes, including the three project lakes (SD DENR 1988). Sediment surveys conducted by SDGFP in 2009 estimated 40,800, 30,600 and 14,300 cubic yards of sediment deposition in Bismarck, Horsethief and Lakota Lakes, respectively. Forest Service sediment estimates were approximately 24,000, 25,000 and 22,000 cubic yards at Bismarck, Horsethief and Lakota Lakes, respectively.

Beneficial uses assigned to these three lakes and their impounded streams are shown in Table 3 below. All waterbodies in South Dakota are also assigned the beneficial use of “fish and wildlife propagation, recreation and stock watering waters” (ARSD 74:51:03:01). Not all streams in the project area have been assessed for beneficial use attainment. At Horsethief Lake, the sediments bind with phosphorus resulting in a water quality impairment to the coldwater permanent fisheries beneficial use due to high pH levels (SD DENR 2010; 2012). A Total Maximum Daily Load (TMDL) for pH has been prepared by the SD DENR for Horsethief Lake (SD DENR 2010). The coldwater permanent fisheries beneficial use at Horsethief Lake is also impaired due to high water temperatures from natural sources (SD DENR 2012).

**Table 3: Project Lakes and Impounded Streams Beneficial Use Assignments**

Waterbody	Beneficial Use	Support	Cause	Source
<b>Bismarck Lake</b>	Coldwater Marginal Fish Life Immersion Recreation Waters Limited Contract Recreation Waters	FULL FULL FULL		
<b>Bismarck Creek</b>	Coldwater Marginal Fish Life			
<b>Horsethief Lake</b>	Coldwater Permanent Fish Life  Immersion Recreation Waters Limited Contact Recreation Waters	NON  FULL FULL	pH (High) Temperature	Natural Sources
<b>Pine Creek</b>	Coldwater Permanent Fish Life Limited Contact Recreation Waters			
<b>Lakota Lake</b>	Coldwater Marginal Fish Life Immersion Recreation Waters Limited Contact Recreation Waters	FULL FULL FULL		
<b>Iron Creek</b>	Coldwater Permanent Fish Life Limited Contact Recreation Waters			

Sources: The 2012 South Dakota Integrated Report for Surface Water Quality Assessment (SD DENR 2012), <http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:51:03:14&Type=Rule> and <http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:51:03:09&Type=Rule> .

Sediment deposition has reduced the water depth and habitat available for fish. These shallower water depths have promoted the growth of cattails along the shoreline, especially at Horsethief and Bismarck Lakes. This has reduced the length of shoreline from which angling can occur, especially along the boardwalk fishing piers at Bismarck and Horsethief Lakes. All three of these dams are a barrier to upstream fish passage.

Aquatic nuisance species (ANS) are defined as water-dependent organisms that are non-native and whose introduction results in economic or environmental harm or harm to human health. ANS may be plant, animal, invertebrate species, or pathogens such as bacteria or viruses. Waterbodies currently infested with ANS are identified in the Forest’s 3-Year ANS Action Plan.

Amphibian chytridiomycosis is a disease caused by the fungus *Batrachochytrium dendrobatidis* that has led to amphibian species extinctions and declines worldwide. The fungus attacks a frog's skin. Since frogs use their skin in respiration, this makes it difficult for the frog to breathe. The fungus also damages the nervous system, affecting the frog's behavior. The chytrid fungus is considered an ANS. It was reported in the Black Hills in 2010 (Kerby 2011) at Lakota Lake and at four other sites. Surveys in 2009 did not detect the fungus. This may be explained due to the 2009 sampling being performed later in the summer when average temperatures were above the critical temperature for chytrid growth (Kerby 2011).

The yellow grub (*Clinostomum complanatum*) though not an ANS is present in Bismarck and Lakota Lakes. The grub is a trematode that infests fish and appears as a large yellowish bump on the scales and is most prevalent in yellow perch. The grubs are not a serious threat to fish health, unless an individual fish has an extremely high infestation. The grub has a complicated lifecycle that includes a fish-eating bird, like the great blue heron, an intermediate host (e.g. a snail) and then the fish. There is no practical treatment or control of this parasite. These parasites can be very unsightly but they do not infect humans (Vermont Fish & Wildlife Department 2004). Thoroughly cooking the fish kills the parasite.

*Region 2 Sensitive Species (R2 SS)*

The finescale dace, lake chub and mountain sucker are Region 2 sensitive species that are known to occur on the Black Hills National Forest. The mountain sucker is also designated a Management Indicator Species (MIS). These species will be covered in the Wildlife section of this EA.

## Environmental Consequences

### ALTERNATIVE 1 – NO ACTION

#### *Direct and Indirect Effects*

The No Action alternative assumes that no implementation of any elements of the modified proposed action (Alternative 2) would take place within the project area. However, such things as ongoing recreation use and facilities maintenance would continue as directed by the Forest Plan.

Existing sediment would remain in the lakes reducing the quality and quantity of fish habitat. In particular, the water quality at Horsethief Lake would continue to be impaired due to excessive nutrients tied up in the sediments. Water quality upstream and downstream of the three project lakes would be the same as the current condition. Fishing access along shorelines and fishing piers would be further reduced as cattails continue to encroach in shallower shoreline areas. Wetlands would not be impacted and the emergent vegetation would continue to expand into the open water as more sediment accumulates in the lakes.

In the No Action alternative the only changes that would occur on the landscape would be those that result from natural occurrences, wildfire suppression, or future project decisions.

### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

#### *Direct and Indirect Effects*

##### *Fisheries*

The draw down and dredging of the project lakes would likely kill the majority of fish in the lakes. Some fish may survive by swimming upstream. A conservation pool of water may remain in the lakes depending on the configuration of the outlet works to drain the lakes and the desire to not completely dewater the lakes to expedite them refilling prior to the next open water recreation season. Some fish may survive if a conservation pool exists, but that would be contingent on factors such as water depth and oxygen levels.

The drawdown of these lakes may reduce, but may not completely eliminate the illegally stocked non-native game fish present, unless the lakes are completely dewatered or the residual pool is shallow enough to freeze solid. The potential exists that non-native fish may swim upstream of the lakes and repopulate the lakes after the lakes refill.

The drawdown of Bismarck and Lakota Lakes would likely reduce the infestation of the yellow grub in the short-term, but it is not likely to completely eradicate it. Likewise, the chytrid fungus present in Lakota Lake is likely to persist given that its host species, frogs and salamanders, would not be eradicated from the lake. The transfer of either the chytrid fungus or yellow grub to other waterbodies would be avoided through the use of clean equipment prior to and after use in a waterbody. The transfer of either of these organisms as a result of this project to Horsethief Lake is avoided by dredging Horsethief Lake first.

The placement of habitat structure(s) to provide a food supply and cover for fish would have a positive benefit. Structure design and placement would be done in cooperation with the South Dakota Department of Game, Fish and Parks.

In the short-term, recreational fishing opportunities would not exist for approximately 6-8 months during lake drawdown and dredging activities. As lake drawdown occurs, fish would become concentrated and potentially more vulnerable to anglers and predators, though access to these fish by anglers would be limited due to the difficulty in walking through the exposed, unconsolidated sediment. Figure 2 is an example of the early stage of the dewatered conditions typical of what is

expected at the project lakes. There would not be angler access allowed during dredging activities for public safety reasons.



**Figure 2. Typical Condition of Early Stage Dewatered Lake**

Recreational fishing impacts would be minimized by alternating the years of draining and dredging the project lakes. Other lakes in close proximity, such as Stockade, Legion, Center and Sylvan Lakes would continue to provide recreational fishing opportunities.

#### *Streams*

There would be no direct or indirect effects on stream inflow or water quality upstream of the three lakes. The sediment deposit sites would have erosion control measures applied or would use distance (as a buffer) to protect water quality to meet the intent of Standard 1301. Erosion control measures would remain in place until native vegetation is established. Efforts have been made to locate the sediment deposit sites in previously disturbed areas away from intermittent or perennial stream channels. In the case of Lakota Lake, a dense vegetative buffer also exists between the sediment deposit site and the lake.

#### *Water Quality*

Water quality and beneficial uses would not be maintained in these lakes while they are drawn down and being dredged. Under average flow conditions (1977 -2011), it is predicted that Horsethief Lake would refill by the end of June, Lakota Lake by the first week of April and Bismarck Lake by the first week of June. This prediction is based on using average flow from the Grace Coolidge gaging station and is dependent on the precipitation pattern when the lakes are refilling. If the spring is wet, there would be no problem refilling the lakes. If the spring is dry, the lakes would take longer to refill. Subsequently, beneficial uses and recreational opportunities would be restored. The removal of sediment should have a long-term positive benefit in reducing or eliminating the water quality impairment due to high pH levels at Horsethief Lake, but it is unlikely to eliminate the temperature impairment that is due to natural sources.

Water quality would be maintained downstream of the dams through several methods. The outlet valves at Horsethief and Lakota Lakes would be opened slowly to minimize the initial mobilization and transport of sediment out of the lakes into Pine Creek and Iron Creek, respectively. Flow releases would be increased enough thereafter to exceed inflow in order to lower the lake level, but would not exceed the capacity of the downstream channel to prevent bank damage to the streams consistent with Forest Plan Standard 1207. Flow releases would be stabilized once the lakes are drawn down in order to maintain downstream beneficial uses consistent with Forest Plan Standard 1210 and to meet the State's anti-degradation policy (ARSD 74:51:01:34). Residual pools would be maintained at each reservoir to protect downstream water quality, settling out any sediment coming from the lake bed or sediment removal. A gravity flow siphon(s) and/or pump would likely be needed at Bismarck Lake to draw down the lake because the valves are difficult to access and may not be functional. The intake pipe(s) for the siphon or pump would be suspended in the water column to avoid sucking sediment off the bottom. Water would be discharged into the channel below Bismarck Dam where it flows into a small pond, which should trap any sediment before it can enter Stockade Lake. If discharge water becomes turbid, the outlet pipe would be relocated to discharge on the streambank where the vegetation would serve as a filter strip. The primary flows into Stockade Lake come from French Creek which would be unaffected by this project.

Once the lakes are drawn down and the sediments have dried out, a bypass pipe would be put in place to convey inflow through the drained lakes to avoid and minimize sediment from the dredging operation from entering the stream. Excavating dried and frozen sediments in combination with work taking place in the winter when surface runoff is likely to be reduced because precipitation would occur in the form of snow rather than rain would minimize sediment erosion. Figure 3 shows an example of the bypass pipe in place for dredging at Dalton Lake in 2011-12.



**Figure 3. Bypass Pipe in Place for Dredging at Dalton Lake in 2011-2012**

### *Wetlands*

There would be some direct effects to the manmade wetlands with this project. These wetlands were established when the dams were built to pond water. Total acres of wetlands would remain unchanged. Emergent vegetation would be reduced around the lake and near fishing piers. Over the years since the establishment of the lakes, emergent vegetation has been on the increase with the storage of sediment in the lakes. With the removal of sediment, this project would remove some emergent vegetation and convert it back to open water. This project would return the lakes back toward their original condition. Some of the emergent vegetation and sediment would be retained to provide for needed habitat as identified in the wildlife report and for lake shore protection. Clean Water Act section 404 permits will be obtained for each lake and conditions of each permit will be followed.

### *Floodplains*

This project would not have any impact or effect on floodplains because floodplains are not being altered with this project.

### **Cumulative Effects for All Alternatives**

Cumulative effects would result from the incremental impact, both positive and negative, of this project when added to past, present and reasonably foreseeable actions. The cumulative effects analysis area is bounded in space as the developed recreation site footprint around the three project lakes, the streams and/ Stockade Lake immediately downstream of these lakes, the sediment deposit sites and the truck haul routes to access the sediment deposit sites. The cumulative effects are bounded in time starting from the construction of these dams to the following 20-50 years after dredging, though many of the disturbance effects tied to dewatering and dredging activities would be more short-term in nature.

### *Fisheries*

The most obvious cumulative effect is the long-term, positive improvement to the quality of the recreational fisheries in these three lakes that results from the removal of 50-70+ years of accumulated sediments. The negative impact to fisheries and recreational fishing opportunities are short-term and are offset by the long-term positive effects to improved lake conditions. In July 2009, cattails were hand-pulled and sprayed at Horsethief Lake. This provided some short-term improved fishable water. Dredging around these piers would inhibit cattail regrowth and provide improved long-term fishing accessibility. Lake beneficial uses and water quality conditions would be quickly restored following dredging and refilling of the lakes. Stream beneficial uses and water quality are predicted to be maintained throughout the project.

The fish species composition of the project lakes would probably change over time. The SDGFP would stock these lakes once they have refilled with hatchery-reared trout to restore the quality of the recreational fishery. The drawdown of these lakes may reduce, but is not likely to eliminate the illegally stocked non-native game fish present, unless the lakes are completely dewatered or the residual pool is shallow enough to freeze solid. The SDGFP in their public scoping response had initially proposed a chemical treatment to kill the fish in the lakes in coordination with the proposed action, but SDGFP has dropped that proposal. Even if all the fish are killed in the lakes, it is reasonably foreseeable that the illegal introduction of other non-native game fish such as yellow perch or northern pike, may occur after the lakes refill given the public's initiative and the availability and ease of introducing these species. It is unlawful for any person to transplant or introduce any fish or fish eggs into any of the public waters of this state without express authority of the Department of Game, Fish and Parks (SDCL 41-13-3).

Proposed activities are not predicted to introduce new or spread existing ANS consistent with Objective 230. Design criteria to ensure equipment is ANS-free prior to and after use in the project area would avoid the introduction of any new ANS or the spread of the chytrid fungus and the yellow grub to other waterbodies. Any reduction in the chytrid fungus or yellow grub is likely to be short-term. This project would not control the spread of the chytrid fungus or yellow grub to other waterbodies from other natural and human-related vectors.

The creation of these lakes for recreational uses and the emphasis on non-native game fish management to support recreational fishing opportunities limits the potential for native fish conservation. Of all the lake surveys done over the decades, the mountain sucker has only been documented in one man-made lake, which was Roubaix Lake on Middle Boxelder Creek in 1998 (SDGFP 1999).

### *Streams*

Stream connectivity would remain unchanged in the project area because removing or modifying the dams is outside the scope of this EA. Subsequently, fish passage upstream past these dams would remain blocked.

### *Water Quality*

The implementation of design criteria, standards and guidelines and regional Watershed Conservation Practices are proven to protect soil, water and riparian resources and meet State nonpoint source water pollution requirements. The implementation of mandatory permit conditions in the Clean Water Act section 404 permits and any other State-issued permits would also control non-point source water pollution to protect water quality. The modified proposed action is predicted to meet stream water quality standards and maintain beneficial uses downstream of the dams throughout the project. Lake beneficial uses are predicted to be restored once surface runoff refills the lakes after dredging is completed. Subsequently, recreational fishing opportunities would be maintained and enhanced in the long-term consistent with Executive Orders 12962 and 13474. Overall, the modified proposed action would meet Forest Plan Objectives 217 and 219.

### *Wetlands*

There would be no cumulative effects to the amount or acres of wetlands, as they would remain unchanged. Emergent vegetation that has been increasing over time along the boardwalks would be reduced and open water increased, moving it closer to when the reservoirs were first established. Consistent with Executive Order 11990 and the Clean Water Act Section 404 permit, the majority of wetland emergent vegetation would be protected for sensitive species habitat and shoreline erosion control. There are no other cumulative impacts to wetlands.

### *Floodplains*

There are no cumulative effects on floodplains because floodplains are not being altered with this project.

## **Heritage**

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### **Affected Environment**

#### *Prehistoric Context*

The Black Hills are part of the greater culture area of the Northwestern Plains with human occupation dating to 11,000 B.P. (Frison 1991). Over this vast period of human occupation, the ecology, subsistence patterns, technology, and the cultures of Black Hills inhabitants have witnessed notable changes (Frison 1991). These changes are grouped into phases of occupation,

which are held in the archaeological record. The Black Hills National Forest Cultural Resources Overview identifies cultural sites that represent all of these prehistoric phases of occupation in the Black Hills (Rom, et al. 1996). Identifiable tribal groups living within the Black Hills area during the Protohistoric period include the Kiowa, Crow, Arapaho, Cheyenne, and Sioux.

Many Native Americans consider the entire Black Hills sacred land. Their belief system links specific locations in and around the Black Hills to star constellations (Rom, et al. 1996). These spiritually significant locations include but are not limited to: Devil's Tower, Old Baldy Mountain, Hot Springs, Buffalo Gap, Reynolds Prairie, the Spearfish Formation "race track" that surrounds the Black Hills, and Harney Peak (Goodman 1992). Ceremonies are performed at these sacred locations during specific periods on the celestial calendar or weather events (Goodman 1992).

### *Historic Context*

Although influenced by Euro-American culture through the introduction of horses, guns, and disease as early as the 17th century, sporadic use of the Black Hills by Euro-Americans largely began in the early 1800's and consisted mainly of fur trappers and traders (Sundstrom 1989). The western half of South Dakota, including the Black Hills, portions of southern North Dakota, and nearly the entire area of the Powder River Basin in Wyoming and Montana was recognized as unceded Indian Territory by the 1868 treaty between the United States and the Sioux and Arapaho. More intense Euro-American occupation in the Black Hills began shortly after gold was discovered in the Black Hills in 1874. It was this discovery that brought a full scale influx of Euro-American prospectors and miners to the Black Hills.

Historic settlement in the Black Hills by Euro-Americans is generally auxiliary to this history of the mining industry. Homestead patents are common from the late 1800's through the 1920's. Industries such as the ranching and logging industry became common in the early 1900's. However, much of the land was not patented and remains public land. During the Depression/New Deal Period (1920-1941), public works projects became common across the Black Hills landscape. The Civilian Conservation Corp (CCC) and the Works Progress Administration (WPA) organized groups of men in camps to construct lookouts, roads, trails, dams, and wells throughout the area.

Within the Byway Lakes Enhancement Project area there are no known cultural resources determined eligible for listing on the National Register of Historic Places. A total of four sites determined not eligible for listing on the National Register of Historic Places are located within the project area. All four sites are considered historic. They include historic artifact scatters, non-farm ruins, mine, and a road.

### *Field Surveys*

The Forest Service conducted an in-house Level I cultural resource inventory of the entire 28 acres of the project Area of Potential Affect (APE). During the Level I inventory it was determined that further Level III survey was needed.

There was prior adequate survey on 26.3 acres of the 28 acres from past projects. New surveys for cultural resources were conducted on 1.7 acres of the Lakota Lake sediment deposit site APE. No new cultural resources were recorded.

### *Section 106 Project Concurrence*

The Black Hills National Forest compiled the results of the Level III survey in a Section 106 report. The Hell Canyon Ranger District determined that the Byway Lakes Enhancement Project will result in No Historic Properties Affected and recommended that the project proceed as planned (Schlosser 2013). Results of the analysis were reported to the South Dakota SHPO and affiliated Native American Tribes for comment and concurrence on March 18, 2013. The South



Dakota SHPO concurred with the findings of this report on March 26, 2013 (SHPO Concurrence 130318006F).

## **Environmental Consequences**

### ALTERNATIVE 1 – NO ACTION

#### *Direct and Indirect Effects*

If there is no federal action, then there is no undertaking, as defined in 36 CFR Part 800.16(y), for Section 106 of the National Historic Preservation Act (16 U.S.C. 470f). There are no eligible or unevaluated sites within the project area. Therefore, the effects of no action have little, if any, potential to effect cultural resources, as no known cultural resources exist within the project area.

### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

#### *Direct and Indirect Effects*

The Forest Service determined there are no eligible or unevaluated cultural sites within the project area. The South Dakota State Historic Preservation Office (SHPO) concurred with this determination. Furthermore, SHPO concurs with a finding of no historic properties affected for the proposed project on March 26, 2013.

The implementation of the Modified Proposed Action may cause the inadvertent discovery of cultural resources. If during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area are uncovered, all operations will cease within a 100-meter radius of the site location and a District Archaeologist notified immediately. The SHPO and regional THPOs will be notified of the discovery and provided an opportunity to comment. Any cultural resources located during project implementation will be protected based on the recommendations of the District Archaeologist and the South Dakota SHPO.

### **Cumulative Effects for All Alternatives**

The nature of the cultural resources and the foreseeable actions in the project area dictate that the cumulative effects area should match the physical site boundaries. Therefore, the cumulative effects area is defined as the known archaeological sites in the identified sediment sites, newly constructed trails, and access roads to and from the project area. The timing limit for the cumulative effects analysis is 20 years; ten years prior to present and ten years in the future.

Cultural resources are non-renewable. Due to both natural and human processes, the loss of cultural resources has happened in the past and would happen in the future. One cumulative effect is that over time fewer cultural resources would be available to learn about past human life-ways, to study changes in human behavior through time, and to interpret the past to the public. Recording and archiving basic information about cultural resources in the proposed project area serves to partially mitigate potential cumulative effects.

No adverse effects are expected to occur as a result of any alternative provided that the design criteria are followed. Due to the lack of eligible cultural resource sites within the project area, there would be no direct or indirect effect to cultural resources. There would be no cumulative effects associated with the Byway Lakes Enhancement Project.

## **Wildlife**

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### **Affected Environment**

These lakes and the sediment deposit sites provide habitat for wildlife commonly found in the Black Hills region. Wildlife species include; game animals (i.e. elk, deer, turkey, cougar),

various small mammals (including bats and meadow jumping mouse), birds, amphibians and reptiles. Osprey feed at all three lakes and a nest is present at Bismarck Lake. The list of wildlife species analyzed for this project include: Federally listed endangered or threatened species (See BA/BE), Rocky Mountain Region (R2) listed sensitive species, Norbeck Focus Species, Forest-level selected Species of Local Concern (SOLC), Management Indicator Species (MIS), and Migratory Birds. Furthermore, effects to wildlife habitat refer to Horsethief, Lakota and Bismarck Lakes, the shoreline, sediment deposit sites, and haul routes. If a buffer is analyzed, that will be mentioned. Riparian habitat is covered in the Hydrology and Fisheries section.

Field surveys were conducted in January, February, and March 2013. However, because of recent wildlife field surveys for timber sales in Vestal (which included Bismarck Lake) and Norbeck (which included Lakota and Horsethief Lakes) project areas, there was considerable knowledge of wildlife use/presence of the area. The streams associated with each of the project lakes were also surveyed for potential habitat for beaver, leopard frogs and red-bellied snakes. Other species present, such as turtles or osprey, were also documented. Each lake contains an area(s) that would not be dredged to protect important habitat for frogs and other wildlife, such as beaver, turtles, and ducks (See Figures 4-6, below, for “Wildlife Exclusion Areas”). These areas contain cattails, and at Bismarck Lake, a beaver lodge.



**Figure 4. Horsethief Lake Wildlife Exclusion Area (indicated in red).**



Figure 5. Bismarck Lake Wildlife Exclusion Area (indicated in red).



Figure 6. Lakota Lake Wildlife Exclusion Area (indicated in red).

## Norbeck Wildlife Preserve Focus Species

Both Lakota Lake and Horsethief Lake are within Management Area (MA) 5.4A-Norbeck Wildlife Preserve. The Norbeck Organic Act requires that the Norbeck Wildlife Preserve be managed for the “*protection of game animals and birds and to be recognized as a breeding place therefor*” (Public Law 258. 1920). The Norbeck Wildlife Preserve Focus Species List was developed because of the large number of game animal and bird species that occur in the Norbeck Wildlife Preserve, it is not possible to individually focus on all game animals and all birds. By focusing on a limited number of species that use key habitat elements, management would provide for all game animals and birds in Norbeck by using a limited number of game animals and birds and their habitat elements to guide management. This does not mean that management would ignore all other wildlife species, nor does it mean we can manage for every focus species on every acre. Because Lakota Lake and Horsethief Lake are within MA 5.4A, ***this species list is only pertinent to Lakota and Horsethief Lakes.***

Game animals and birds that were selected for the Norbeck Wildlife Preserve Focus Species List represent species that utilize late successional and open ponderosa pine stands, aspen and other hardwoods, spruce, riparian and burned areas (Table 4). Some of these focus species may also be on the Region 2 Sensitive Species (R2 SS) list and would be analyzed in the Biological Assessment/Biological Evaluation (BA/BE) for the Byway Lakes Enhancement Project, Management Indicator Species (MIS) or Species of Local Concern (SOLC) species’ lists. It will be noted if the focus species occur on other lists.

**Table 4: Norbeck Wildlife Preserve Focus Species List (Griebel et al. 2007)**

Species	Habitat Description
<b>Game Animals</b>	
Mountain Goat ( <i>Oreamnos americanus</i> ) *also SOLC	Inhabits rugged terrain such as steep cliffs and rocky outcrops (Higgins et al. 2000). Primary range consists of the rugged terrain around Harney Peak, the Needles and Mount Rushmore (Richardson 1971).
Bighorn Sheep ( <i>Ovis canadensis</i> ) *also R2 SS	Inhabits semi-open terrain on steep cliffs and rocky slopes, usually in areas with limited human contact. Generally avoids dense forest stands (Higgins et al. 2000).
Rocky Mountain Elk ( <i>Cervus elaphus</i> )	Found in a variety of habitats such as coniferous forests, meadows, and forest edge (Higgins et al. 2000). Requires understory forage. Prefers limited human contact and avoids motorized areas.
White-tailed Deer ( <i>Odocoileus virginianus</i> ) *also MIS	Very adaptable species that can live in almost any habitat including grasslands, wetlands and woodlands (Higgins et al. 2000). Requires rich understories of shrubs, forbs and grass for food, cover and fawn habitat.
Merriam’s Turkey ( <i>Meleagris gallopavo merriami</i> )	Uses a variety of habitats. Winter habitat consists primarily of ponderosa pine with greater basal area composed of mature trees. Open pine stands and meadows with sufficient ground vegetation provide good summer habitat (Lehman 2005, Rumble & Anderson 1993). Primarily use large pine for roost trees.
<b>Birds</b>	
Mountain Bluebird ( <i>Sialia currucoides</i> )	Open ponderosa pine forest intermixed with grasslands, shrubs, burned areas and snags that serve as nesting cavities (Wiggins 2006).
Golden-crowned Kinglet ( <i>Regulus satrapa</i> ) *also MIS	Found almost exclusively in white spruce habitat but occasionally present in habitats with a spruce component (Panjabi 2003).
Brown Creeper ( <i>Certhia americana</i> ) *also MIS	In the Black Hills, white spruce and late successional pine appears to be the most important habitat type for this species (Panjabi 2001, 2003).

Species	Habitat Description
Ruffed Grouse ( <i>Bonasa umbellus</i> ) *also MIS	Variable aged aspen stands, other hardwoods and pine forests provide habitat. Winter habitat is almost exclusively aspen (DeGraaf et al. 1991, Tallman et al. 2002).
Song Sparrow ( <i>Melospiza melodia</i> ) *also MIS	Streamside thickets, particularly shrubby willows, are required for habitat. Occasionally found in adjacent spruce habitat (Panjabi 2003).
Northern Goshawk ( <i>Accipiter gentilis</i> ) *also R2 SS	Forages in a variety of forested areas and small openings; nests primarily in dense mature conifer forests (Kennedy 2003). Prey species habitat includes shrubs, dense understory, and diverse habitats.
Black-backed Woodpecker ( <i>Picoides arcticus</i> ) *also MIS and R2 SS	Occurs most frequently in recently burned habitat (Vierling 2005), in mountain pine beetle infested pine stands (Bonnet et al. 2008), and at lower densities in other forest types including late-successional pine forest. Year-round resident.

### Management Indicator Species (MIS)

The Phase II Amendment to the 1997 Forest Plan-Final Environmental Impact Statement (USDA Forest Service 2005) lists MIS to be considered during project-level planning. MIS species were selected from that list for analysis in this document if they have habitat or populations present within the Byway Lakes Enhancement Project. Some MIS species have other status (such as R2 Sensitive Species), and additional analyses are provided for them in the BA/BE.

Four of the nine Forest MIS were selected for analysis based on available habitat (see Table 5). These species are: beaver, white-tailed deer, song sparrow, and mountain sucker. Habitat for the other five species is lacking in the project area.

**Table 5: MIS List and Rationale for Project-level Analysis**

Species	Analyzed	Rationale	Habitat Description
Beaver ( <i>Castor canadensis</i> )	YES	There is an active beaver colony at Bismarck Lake.	Large rivers and lakes down to streams, marshes and small lakes with seepage/weak flows adequate for damming and suitable woody vegetation (Higgins et al. 2000).
White-tailed deer ( <i>Odocoileus virginianus</i> )	YES	Species was observed.	Very adaptable species that can live in almost any habitat. In South Dakota, this includes grasslands, wetlands and woodlands (Higgins et al. 2000).
Golden-crowned kinglet ( <i>Regulus satrapa</i> )	NO	Habitat is not present within the scope of the project.	Found almost exclusively in white spruce habitat but occasionally present in habitats with a spruce component (Panjabi 2003).
Grasshopper sparrow ( <i>Ammodramus savannarum</i> )	NO	Habitat is not present within the scope of the project.	Found almost exclusively in native mixed-grass prairies (Panjabi 2003).
Black-backed woodpecker ( <i>Picoides arcticus</i> )	NO	Habitat is not present within the scope of the project.	Burned areas with a high density of pre-burn snags; mountain pine beetle infested areas; dense and/or mature forests with a high snag density (Anderson 2003, Panjabi 2003, Bonnot et al. 2008).

Species	Analyzed	Rationale	Habitat Description
Brown creeper ( <i>Certhia americana</i> )	NO	Habitat is not present within the scope of the project.	In the Black Hills, white spruce and late successional pine appears to be the most important habitat type for this species (Panjabi 2001, 2003).
Ruffed grouse ( <i>Bonasa umbellus</i> )	NO	Habitat is not present within the scope of the project.	Variable aged aspen stands, other hardwoods and pine forests provide habitat. Winter habitat is almost exclusively aspen (DeGraaf et al. 1991, Tallman et al. 2002).
Song sparrow ( <i>Melospiza melodia</i> )	YES	Riparian areas provide desirable habitat around/near the Lakes.	Streamside thickets, particularly shrubby willows, are required for habitat. Occasionally found in adjacent spruce habitat (Panjabi 2003).
Mountain sucker ( <i>Catostomus platyrhynchus</i> )	YES	Iron Creek provides potential habitat for this species.	Large rivers, lakes, reservoirs, prairie streams but most often in cool, clear, moderately swift mountain streams with mud, cobble, or boulder substrate (Isaak et al. 2003).

### Beaver (MIS)

The beaver was selected as a Forest MIS to evaluate the effects of the Forest Plan implementation and natural change on the ability of the Forest to support species that rely on a variety of riparian and hardwood forest conditions to meet their needs (USDA Forest Service 2005).

In the project area there is an active colony at Bismarck Lake. Forest-wide, long-term beaver population trend has increased since heavy trapping has decreased, but it is less than its potential. The current distribution of beaver is reduced based on the number of inactive beaver sites that were observed (during monitoring efforts in 2007), especially in headwater streams, where water and/or a suitable food supply is lacking (USDA Forest Service 2010).

### White-tailed Deer (MIS & Norbeck Wildlife Preserve Focus Species)

White-tailed deer were selected as an MIS on the Forest to evaluate forest conditions, including understory shrubs, needed to support this species (USDA Forest Service 2005). The 2009 Black Hills National Forest Monitoring and Evaluation Report (USDA Forest Service 2010) stated that for this species, Forest-wide habitat trend is stable or increasing. The Forest is meeting Objective 217 and Objective 238a based on habitat and population trends.

### Song Sparrow (MIS & Norbeck Wildlife Preserve Focus Species)

The song sparrow was selected as an MIS to evaluate the effects of Forest Plan implementation and natural change on the ability of the forest to support characteristic riparian species that rely on a variety of riparian conditions to meet their needs (USDA Forest Service 2005).

The song sparrow can be found throughout the Black Hills but is primarily dependent on riparian habitat with streamside thickets and willows. Riparian habitats have decreased in quality since the pre-European settlement era, indicating a long-term declining habitat trend. More recent, shorter-term riparian trends are unclear. Small riparian protection projects have improved riparian conditions in some areas and contribute to habitat enhancement. Riparian areas are meeting Forest plan Objective 238a (USDA Forest Service 2008).

### Mountain Sucker (MIS & R2 SS)

The mountain sucker was designated as a MIS to evaluate the quality and connectivity of stream habitat on the Black Hills National Forest. The mountain sucker is also a R2 SS. Of all the lake

surveys done over the decades, the mountain sucker has only been documented in one man-made lake, which was Roubaix Lake on Middle Boxelder Creek in 1998 (SDGFP 1999). The mountain sucker has historically occurred in Iron Creek upstream and downstream of Lakota Lake, but recent surveys only captured this species downstream in Battle Creek (Schultz 2011). Suitable habitat exists in Iron Creek for the mountain sucker. There is no habitat for the mountain sucker within the project lakes.

### *Species of Local Concern (SOLC)*

Black Hills Supplement “r2\_bh\_2600-2011-1” to Forest Service Manual 2600 became effective September 6, 2011, and provides direction for the management of SOLC (USDA Forest Service 2011). As defined by this supplement, a species of local concern is a plant, fish or wildlife species (including subspecies or varieties) that does not meet the criteria for sensitive status. These could include species with declining trends in only a portion of Region 2, or those that are important components of diversity in a local area. The local area is defined as Forest Service lands within the Black Hills National Forest. This supplement also provides a detailed explanation of the evaluation criteria used to select species of local concern and a current list for the Black Hills National Forest (USDA Forest Service 2011). Table 6 lists potential SOLC for the Black Hills National Forest. Rationale is provided if the species is not analyzed for this project.

**Table 6. SOLC List and Rationale for Analysis**

<b>Species</b>	<b>Species Present? (Y/N)</b>	<b>Habitat Present? (Y/N)</b>	<b>Included in NEPA Document? (Y/N)</b>	<b>Rationale for NOT carrying species forward into the NEPA document</b>
Atlantis fritillary ( <i>Speyeria atlantis pahasapae</i> )	YES	YES*	YES*	See below.
Tawny crescent ( <i>Phycoides batesii</i> )	NO	YES*	YES*	See below.
Callused vertigo ( <i>Vertigo arthuri</i> )	NO	NO	NO	No impacts to habitat are expected.
Mystery vertigo ( <i>Vertigo paradoxa</i> )	NO	NO	NO	No impacts to habitat are expected.
Frigid ambersnail ( <i>Catinella gelida</i> )	NO	NO	NO	No impacts to habitat are expected.
Striate disc ( <i>Discus shimekii</i> )	NO	NO	NO	No impacts to habitat are expected.
Sharp-shinned hawk ( <i>Accipiter striatus</i> )	NO	NO	NO	No impacts to habitat are expected.
Cooper’s hawk ( <i>Accipiter cooperi</i> )	YES	NO	NO*	No impacts to habitat are expected. There is a nest close to the Horsethief gravel pit sediment deposit site. Timing of this project is not expected to impact nesting birds.
Broad-winged hawk ( <i>Buteo platypterus</i> )	NO	NO	NO	No impacts to habitat are expected.
Northern saw-whet owl ( <i>Aegolius acadicus</i> )	NO	NO	NO	No impacts to habitat are expected.

Species	Species Present? (Y/N)	Habitat Present? (Y/N)	Included in NEPA Document? (Y/N)	Rationale for NOT carrying species forward into the NEPA document
Pygmy nuthatch ( <i>Sitta pygmaea</i> )	NO	NO	NO	No impacts to habitat are expected.
American dipper ( <i>Cinclus mexicanus</i> )	NO	NO	NO	The project area lacks habitat for this species. This species inhabits clear, fast-flowing streams (Anderson 2002).
Black and white warbler ( <i>Mniotilta varia</i> )	NO	NO	NO	This area lacks the lower elevation bur oak woodlands and associated edges that is typical habitat for this species in the Black Hills (Beason et al. 2006)
Northern long-eared myotis ( <i>Myotis septentrionalis</i> )	NO	NO	NO	No impacts to habitat are expected.
Small-footed myotis ( <i>Myotis ciliolabrum</i> )	NO	NO	NO	No impacts to habitat are expected.
Long-eared myotis ( <i>Myotis evotis</i> )	NO	NO	NO	No impacts to habitat are expected.
Long-legged myotis ( <i>Myotis volans</i> )	NO	NO	NO	No impacts to habitat are expected.
Northern flying squirrel ( <i>Glaucomys sabrinus</i> )	NO	NO	NO	No impacts to habitat are expected.
Meadow jumping mouse ( <i>Zapus hudsonius campestris</i> )	YES	YES*	YES*	See below.
Mountain goat ( <i>Oreamnos americanus</i> )	YES	YES*	YES*	See effects under Focus Species.
Bighorn sheep ( <i>Ovis canadensis</i> )	NO	NO	NO	The Rocky Mountain bighorn sheep is a R2 sensitive species and is analyzed in the Byway Lakes Enhancement Project Wildlife BA/BE.

### Atlantis Fritillary (SOLC)

The Atlantis fritillary is an endemic butterfly of the Black Hills and is restricted to Custer, Lawrence, and Pennington counties. It prefers wet meadows and moist canyons (Marrone 2002). Riparian meadow habitat exists for the Atlantis fritillary and several other butterfly species in the project area. Atlantis fritillary was found during survey work near Lakota Lake (Marrone 2006).

### Tawny Crescent (SOLC)

The tawny crescent is found in open meadows, stream bottoms, roads, trails, and riparian woodlands (Stefanich 2001). In South Dakota the tawny crescent is restricted in its distribution to the Black Hills. Riparian meadow habitat exists for the tawny crescent and several other butterfly species.



### Meadow Jumping Mouse (SOLC)

The meadow jumping mouse is associated with marshy areas and moist grasslands near streams, coniferous and deciduous forest, mixed and riparian shrublands. They hibernate usually from October-April (Higgins 2000). These mice have been found along Iron Creek (Cryan & Ellison 2005). Each of the project lakes contain similar habitat and the presence of the meadow jumping mouse is expected in the project area.

### Mountain Goat (SOLC)

This species inhabits rugged terrain including cliffs, rock faces, ledges, and talus slopes, typically above timberline. The Black Hills mountain goat population occurs largely within the Black Elk Wilderness, Buckhorn Mountain where patch clearcuts have been created to provide forage, within Crazy Horse boundary, and somewhat in the Norbeck Wildlife Preserve.

### *Threatened and Endangered Species*

There are no federally threatened, endangered or proposed fish species known to occur or likely to be affected by management activities in the analysis area nor any designated critical habitat (USFWS 2013).

A list of federally threatened, endangered and proposed species has been provided by the U.S. Fish and Wildlife Service (USFWS), South Dakota State Office, and last verified on March 11, 2013 (USFWS 2012). The USFWS lists the following endangered and/or threatened species for Custer County, South Dakota: whooping crane, sprague's pipit, and black-footed ferret. The list for Pennington County is the same as Custer County but also includes the least tern.

The whooping crane and least tern have been removed from the list of species considered on the Black Hills National Forest under Section 7 consultation (letter of concurrence from D. Gober, Field Supervisor, USFWS, Pierre, South Dakota, dated August 8, 2003). Although the black-footed ferret is listed for Custer County, it is listed as endangered, where they have been re-introduced within Wind Cave National Park, under a special permit that includes provisions for take. Additionally, the black-footed ferret is listed for Pennington County, and it is an experimental population located in eastern Pennington County, where they have been re-introduced into Badlands National Park and the Conata Basin of Buffalo Gap National Grassland. Habitat for the black-footed ferret is not present in the Lakes project area. There are no prairie dog colonies present. It was determined that management activities on the Forest would have '*no effect*' on these species because the Black Hills National Forest lacks suitable habitat. Sprague's Pipit is listed as a candidate species by the U.S. Fish and Wildlife Service. The USFWS lists the Sprague's pipit as a possible migrant through Custer and Pennington Counties. This species uses large areas of grassland habitat throughout the year. This type of habitat is not present in the project area, but they may migrate through the project area. This species has not been observed in the project area. The project and associated activities would not reduce habitat for this species and, therefore, would have '*no effect*' on Sprague's pipit.

Refer to Appendix D which contains a summary of the BA/BE completed for this project.

### *Region 2 Sensitive Species (R2 SS)*

Refer to the Byway Lakes Enhancement Project BA/BE for a thorough analysis of species and effects from alternatives. The listed R2 sensitive species were analyzed in the BA/BE due to the presence of potential habitat in the project area. R2 sensitive species not listed below do not have habitat in the project area. Some of these species have special Forest Plan Direction and are analyzed in the BA/BE.

## R2 Sensitive Species with Potential Habitat in the Byway Lakes Enhancement Project:

- Northern Leopard Frog (*Rana pipiens*)
- Black Hills Redbelly Snake (*Storeria occipitomaculata pahasapae*)
- Mountain Sucker (*Catostomus platyrhynchus*)
- Regal Fritillary (*Speyeria idalia*)

No critical habitat exists in the Lakes Enhancement project area for the following species: fringed myotis, Townsend's big-eared bat, hoary bat, black-tailed prairie dog, American marten, bighorn sheep, bald eagle, Northern goshawk, loggerhead shrike, grasshopper sparrow, or Cooper's mountain snail. Some of these species are likely to forage in the area during fall and winter months. Bighorn sheep may move through the area, but preferred habitat is lacking within the project area.

There is a northern goshawk nest within ½ mile of Horsethief Lake and the gravel pit sediment deposit site. However, timing of this project is outside of the nesting period. Standard 3111 will be followed if project activities are necessary until April 1. Therefore, 'no impact' is expected.

### Northern Leopard Frog (R2 SS)

This species requires three types of habitat. Winter habitat, usually lakes, streams or ponds, is needed for winter torpor. High oxygen saturation is best in the winter waters. Summer habitat for this insectivorous frog is considered upland forage ground often near the breeding ponds. The third habitat is breeding/tadpole habitat. This is usually shallow bodies of water with little to no current, aquatic vegetation, good water quality, and little overhead canopy.

Suitable habitat exists at all three project lakes. It should be noted that the chytrid fungus (*Batrachochytrium dendrobatidis*) has been detected at Lakota Lake. Frogs at Horsethief and Bismarck Lakes have not been tested. This disease is causing declines in amphibians world-wide (Smith & Keinath 2007).

### Black Hills Redbelly Snake (R2 SS)

This small, non-venomous snake is associated with mesic sites such as wetlands, riparian areas, and wet meadows (USDA Forest Service 2000). They occur in moist woodlands with adequate cover of rocks, logs, tree bark or leaf litter. Den sites are often in rocky cracks and crevices. This snake feeds on slugs, earthworms, and soft-bodied invertebrates found in moist litter and soil. Refer to Smith & Stephans (2003) for additional discussion of habitat relationships, life history, and disturbance ecology. The biggest threat appears to be removal of large, downed woody material and logging in wet areas. Predation, wildfire and road use can impact this species. Observations have occurred within the project area.

### Mountain Sucker (R2 SS & MIS)

The mountain sucker occurs most often in cool, clear mountain streams with moderate water velocities. Stream substrate associated with mountain sucker habitat varies widely and ranges from mud to sand, gravel, and boulders, although cobbles are most common. This species is found on the stream bottom and is closely associated with cover (exposed roots, undercut banks, log jams and boulders).

Mountain suckers are native to the Black Hills and comprise the eastern-most range of the species. Recent surveys suggest mountain suckers occur in many of its historic drainages throughout the Black Hills (Isaak et al. 2003), but localized population reductions or absence at selected sites has occurred (USDA Forest Service 2010).

### Regal Fritillary (R2 SS)

This species appears to be restricted to intact native prairies, especially where violets provide a nectar source (Royer & Marrone 1992, NatureServe 2012) and other open sites including damp meadows, marshes, wet fields and mountain pastures (Marrone 2002). This species relies heavily on *Viola spp.* in the spring for larval host plants. After hatching, the unfed caterpillar overwinters on the ground beneath leaves. This species is suspected to disperse to isolated mountain meadows. Suitable habitat is limited to larger native meadows in the Black Hills where native violets exist (Royer & Marrone 1992, Marrone 2002).

### *Migratory Birds*

Many species of migratory birds are of international concern due to naturally small ranges, loss of habitat, observed population declines and other factors. Species of concern applicable to project-level conservation are identified by many sources, including the Endangered Species Act, the Regional Forester's sensitive species list, the Black Hills National Forest MIS and Species of Local Concern list, internal and public scoping efforts, and the USFWS Birds of Conservation Concern (BCC) (USFWS 2008). BCC 2008 publication partitions North America into 37 Bird Conservation Regions (BCRs, Fig. I). The Black Hills is included in BCR 17 – Badlands and Prairies. Of the 28 bird species found in BCR 17, 15 are duplicated on the Regional Forester's sensitive species list and are evaluated in the BA/BE if they have potential to occur in the Black Hills. Six species are not expected to occur in the Black Hills due to lack of habitat. There are seven remaining species that could potentially occur in the Black Hills: golden eagle, prairie falcon, upland sandpiper, black-billed cuckoo, red-headed woodpecker, pinyon jay, and dickcissel. These birds may be seen flying within or over the Byway Lakes Enhancement Project area, but no impacts are expected, and thus, are not further analyzed.

## **Environmental Consequences**

### *Norbeck Wildlife Preserve Focus Species*

#### ALTERNATIVE 1 – NO ACTION

##### *Direct and Indirect Effects*

The No Action alternative assumes that no implementation of any elements of Alternative 2-Modified Proposed Action would take place within the project area. Therefore no effects to any Focus Species are expected.

#### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

##### *Direct and Indirect Effects*

##### Game Animals

No direct or indirect effects are expected to occur to bighorn sheep because their use in and around the lakes is minimal, if at all. See the Byway Lakes Enhancement Project BA/BE for further information.

*Elk, white-tailed deer, mountain goat* and *Merriam's turkey* would have no expected direct effects to occur.

1. Horsethief Lake - These species may be present in the areas surrounding the lake or in the proposed sediment sites. The high recreation use during summer months (both alternatives) already limits use of this lake. During implementation, which is expected to occur in the fall/winter months (after Labor Day), disturbance to these animals is likely to increase, causing displacement of individuals to surrounding habitat, in the short-term. Suitable habitat exists in the surrounding area, so displacement would be temporary and

impacts would be negligible. After the rehabilitation/re-seeding of the sediment deposit sites is accomplished, and forage is available, it is expected that there will be a negligible benefit to these game animals with the increased forage.

2. Lakota Lake - This site experiences less recreational use than Horsethief Lake. Elk, white-tailed deer, and Merriam's turkey have been seen in the meadows surrounding this Lake. Mountain goats may move through the area. The proposed action is expected to cause short-term displacement of individuals during project activities; however, suitable habitat exists in the surrounding area. Rehab work includes re-seeding with native seed mix and removing encroaching pine in the meadow. The benefit of the rehab work, which is expected to create native forage, will be negligible.

### Birds

No direct or indirect effects are expected to the mountain bluebird, golden-crowned kinglet, brown creeper, ruffed grouse, or black-backed woodpecker because these species rely on forest structure, which would not be impacted by this project. Birds that rely on insects for forage would benefit temporarily. Additionally, no direct effects are expected for the northern goshawk. However, a portion of Horsethief Lake and the entire gravel pit sediment deposit site fall within ½ mile of the Horsethief goshawk nests. Although these nests have not been active for a few years timing restrictions (Standard 3111) are in place if the territory is active. This would minimize any indirect effects to the northern goshawk.

### Song Sparrow (MIS & Norbeck Wildlife Preserve Focus Species)

No direct effects are expected because implementation is expected to occur in winter months when this species is not nesting or present. Indirect effects from the proposed action include short-term displacement of nesting song sparrows because equipment may disturb individuals, or it may destroy some nesting habitat. However, there would still be areas for sparrows to nest. If shrubs are planted during rehab work, song sparrow nesting habitat may increase some. Song sparrows forage mainly on insects during breeding season. There is expected to be an increase in insects when the dredged area/sediment spoils thaw. This would benefit this species temporarily.

### **Cumulative Effects for all Focus Species**

The cumulative impact area for this analysis is the recreation areas around each lake, the sediment deposit sites and downstream habitat; activities beyond this area have a diminished effect on wildlife habitat within the project area. The cumulative effects are bounded in time as the next 20-50 years, though many of the disturbance effects tied to dewatering and dredging activities would be more short-term in nature. This applies to all cumulative effects for all species throughout this report and will not be repeated.

Past, present and reasonably foreseeable activities within Lakes Enhancement project area include timber harvest, timber thinning, wildfire, grazing, temporary road construction and maintenance, noxious weed control, wildlife habitat improvement projects, dispersed recreational use, trapping, and stocking the lakes with non-native fish.

Under the proposed action, there could be some incremental impacts from disturbance.

Implementation activities are expected to temporarily produce year-round disturbance impacts to some of these species in addition to those from recreation activities, but the impacts are expected to lessen in the winter once the project is complete; however, recreational disturbance is expected to continue, with use highest from Memorial Day through Labor Day. The proposed action could incrementally lead to additional invasive weeds, but include control activities to mitigate these impacts. The proposed action would include a negligible increase in forage. Although there could be short-term adverse indirect effects to these species, especially for species nesting in the area during project activities, adverse cumulative effects are not expected.

Roads could remove habitat, create barriers, or decrease habitat quality for some species. However, no new roads will be added and any road temporarily opened would be closed following use. This is expected to temporarily produce disturbance effects to these species. It may even cause short-term displacement, but these species would be expected to return to the project area.

### *Management Indicator Species (MIS)*

#### ALTERNATIVE 1 – NO ACTION

##### *Direct and Indirect Effects*

The No Action alternative assumes that no implementation of any elements of Alternative 2-Modified Proposed Action would take place within the project area. Therefore no effects to any MIS are expected.

#### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

##### *Direct and Indirect Effects*

##### Beaver (MIS)

There is potential to try to trap and relocate beaver from Bismarck Lake the spring (2014) before the dredging occurs. This would be expected to reduce the impacts to beaver. However, if beaver are not removed, then direct and indirect effects are expected to occur. Food sources at Bismarck Lake are not expected to change with the dredging project, however, food caches most likely would be destroyed. Beaver may be displaced, in the short-term, or even die, when water levels drop. They may leave the lake to seek refuge and/or food elsewhere, but finding a new territory is expected to be challenging, and most likely unsuccessful, in the winter time. This is expected to increase chances of fatality, i.e., starvation, predation or vehicle collision. Young beaver, especially, would most likely die because of lack of water and food. When the lake refills beaver may recolonize the lake.

##### White-tailed Deer (MIS & Norbeck Wildlife Preserve Focus Species)

See effects under the Focus Species section above.

##### Song Sparrow (MIS & Norbeck Wildlife Preserve Focus Species)

See effects under the Focus Species section above.

##### Mountain Sucker (MIS & R2 SS)

See effects under the Region 2 SS section below.

### **Cumulative Effects for all MIS**

Management activities may directly or indirectly affect these species by killing, modifying the quality or extent of riparian habitat. Numerous objectives, standards, and guidelines strive to maintain or enhance the quality and/or quantity of existing riparian communities, wetlands and wet-meadow areas.

Activities such as fire suppression, livestock grazing, recreational activities, trapping (beaver) and other management activities have and are expected to continue in the areas of the Byway Lakes Enhancement Project. Recreation uses such as hiking and/or horseback riding would further cause soil compaction, vegetation trampling, and areas void of vegetation. Lakota and Horsethief Lakes are part of the Norbeck Project Area; Bismarck Lake is part of the Vestal Project Area, both of which include large timber sales. Finally, drought has occurred for the past 2 years and is expected to continue.

### *Summary for all MIS*

Population viability for these species (beaver, deer, and song sparrow) was evaluated during the Phase II Amendment to the 1997 Black Hills National Forest Land and Resource Management Plan (USDA Forest Service 2005). The Forest Plan Phase II Amendment determined that population viability across the Planning Area would be maintained for this species if pertinent Forest standards and guidelines are followed. The alternatives would meet these standards and guidelines. Therefore, ***these species are likely to persist on the Forest.***

### *Species of Local Concern (SOLC)*

#### ALTERNATIVE 1 – NO ACTION

##### ***Direct and Indirect Effects***

The No Action alternative assumes that no implementation of any elements of Alternative 2-Modified Proposed Action would take place within the project area. Therefore no effects to any SOLC are expected.

#### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

##### ***Direct and Indirect Effects***

##### Atlantis Fritillary (SOLC)

Habitat for this species exists around the project lakes. Direct and/or indirect effects may occur. Even though dredging would be accomplished during the winter months, butterfly larvae or eggs (in vegetation) could be crushed, buried or removed from the site. The sediment deposit site next to Lakota Lake has the highest potential for negative impacts, although all areas adjacent to the lakes could be impacted by equipment. Negative impacts to habitat are expected to be short-term. Vegetation is expected to re-establish in a few years, creating habitat. Downstream habitat is not expected to be impacted.

##### Tawny Crescent (SOLC)

The effects to the tawny crescent would be the same as the Atlantis fritillary.

##### Meadow Jumping Mouse (SOLC)

Habitat for this species exists around the project lakes. Direct and/or indirect effects may occur. Each Lake contains similar habitat and presence is expected, therefore direct and indirect impacts are expected. Wintering mice may be in meadows used for sediment deposit sites, and thus, individuals would most likely be killed, if present. Vegetation is expected to reestablish within a few years of completion of the project. Therefore, impacts to habitat are expected to be short-term.

##### Mountain Goat (SOLC)

See effects under Focus Species above.

### **Cumulative Effects for all SOLC**

Management activities may directly or indirectly affect these species by killing, modifying the quality or extent of riparian habitat. Indirect effects to the butterflies and meadow jumping mice are mitigated through a wide variety of standards and guidelines, watershed conservation practices, and State BMPs that protect riparian areas. Numerous objectives, standards, and guidelines strive to maintain or enhance the quality and/or quantity of existing riparian communities, wetlands and wet-meadow areas.

Activities such as fire suppression, livestock grazing, recreational activities and other management activities have and are expected to continue in the areas of the Lakes Enhancement Project. Recreation uses such as hiking and/or horseback riding will further cause soil compaction, vegetation trampling, and areas void of vegetation. Lakota and Horsethief Lakes are part of the Norbeck Project Area; Bismarck Lake is part of the Vestal Project Area, both of which include large timber sales.

#### *Summary for all SOLC*

The Environmental Impact Statement for the Phase II Amendment determined that these species are likely to persist across the Planning Area if Forest Plan standards and guidelines are followed. The proposed action would meet these standards and guidelines; the alternatives would contribute toward meeting Forest Objective 221. Therefore, ***these species are likely to persist on the Forest.***

#### *Threatened and Endangered Species*

The project would have ‘no effect’ on threatened or endangered species. Refer to the BA/BE in the project record and Appendix D which contains a summary of the BA/BE completed for this project.

#### *Region 2 Sensitive Species (R2 SS)*

Risk assessments were conducted on the effects of the action alternative on R2 sensitive species that are known to occur in the Black Hills. Several species were not evaluated because suitable habitat is not present in or near the project area. The list of species that occur or may potentially occur in was compiled from field reconnaissance. In addition, literature, South Dakota Natural Heritage Database, and habitat maps provided in the Forest Plan BA/BE, online species information sources, and data collected for amendment to the Forest Plan were used for this Biological Assessment and Evaluation.

The following is a summary of effects to Region 2 sensitive species. A detailed analysis can be found in the BA/BE in the project record.

#### ALTERNATIVE 1 – NO ACTION

##### ***Direct and Indirect Effects***

The No Action alternative assumes that no implementation of any elements of Alternative 2-Modified Proposed Action would take place within the project area. Therefore no effects to any R2 SS are expected.

#### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

##### Northern Leopard Frog (R2 SS)

##### ***Direct and Indirect Effects***

Direct and indirect effects are expected to occur to frogs. The drainage of the lakes would take place after Labor Day, this is the time of year that frogs are most likely hibernating in the mud. This could cause the frogs to become exposed. When dredging (removing the sediment) begins, frogs would most likely be dug up, run over, or exposed, causing mortality. Additionally, all three project lakes are stocked annually with trout. Various trout species will eat frogs, tadpoles, and frog eggs (Smith & Keinath 2007). Smith and Keinath (2007) have observed breeding colonies of chorus and northern leopard frogs in ponds with predatory fish, and seldom were metamorphs found. Aquatic vegetation is important to this species. It is used for laying eggs and cover.

Area(s) at all three project lakes have been identified as important frog habitat and will be excluded from dredging. Additionally, in other areas where cattails are found, a 10-foot swath would be retained to maintain habitat for amphibians and to aid in bank. However, the project is designed to create desirable trout habitat, which is to the detriment of frogs. Vegetation that is removed would create good trout habitat and would greatly increase chances of predation on frogs. At Lakota Lake, the sediment site is just upland from the lake itself. Besides lake edges being impacted, this meadow would also. This may reduce upland/feeding habitat for frogs, in the short-term.

To avoid transferring the chytrid fungus between sites, equipment should be cleaned. This is expected to reduce the risk of infecting frogs with the deadly fungus.

Standards 1301 through 1302 reduce the potential of riparian degradation by dictating that riparian areas be managed for long-term health and sustainability. More specifically, Standard 3106 ensures protection of riparian areas where sensitive species are found. Guidelines 9107 and 9108 prohibit vehicles from entering perennial streams where resource damage would occur, and restrict vehicular traffic in riparian areas to established roads and trails. Furthermore, Guidelines 3211 and 3212 provide for vegetation management design to maintain or improve wildlife habitat and stream stability. Therefore, the proposed action would meet the intent of Objective 213, and continue to provide habitat for the northern leopard frog.

### *Cumulative Effects*

Recreational activities (e.g., horse and ATV) that use or impact streams would continue to occur. Fishing activity is expected to increase with the enhancement of this habitat for fisheries. This may attract more families to the lakes, which then may increase trapping of frogs. Available habitat could be supplemented if timber harvests increase spring/seep water yields, new springs/seeps surface, or if soil moisture levels are maintained. Decreasing soil moisture through timber harvest, slash/fuels disposal projects, and the disposal of existing down woody material (fuel treatments) is expected to continue to reduce adult foraging habitat and adversely affect dispersal. Wildfires have removed canopy which can unfortunately increase ground temperatures, and may limit distribution of this species the Forest. At sites where there are introduced predatory fish, leopard frog productivity has been adversely affected (Smith & Keinath 2007).

**Determination:** The alternatives ‘**may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing**’.

**Rationale for Determination:** The Forest Plan Phase II Amendment has Standards on management in riparian areas, streams, ponds, springs, and other wet areas. Forest Plan Standards/Guidelines are in place to protect riparian areas from additional adverse effects. These 3 lakes are managed for recreational uses and are stocked with predatory fish. Although this project is expected to impact frogs and their habitat, the purpose is for fisheries habitat. Regardless, predatory fish would be introduced and have been introduced to the Lakes.

### **Black Hills Redbelly Snake (R2 SS)**

#### *Direct and Indirect Effects*

Direct and indirect effects are expected for individuals of this species. Under the proposed action, mortality, habitat disturbance or loss (den sites) is expected to occur from equipment and machinery used for road reconstruction, dredging and rehab activities. Road construction may remove downed wood or large rocks available as habitat for this species. This species may also be directly impacted by recreationists (run over, trampled or caught). Herbicide treatment of noxious weeds may potentially affect water quality and plant species diversity.



***Cumulative Effects***

Timber harvesting, fuel treatments, and thinning where this species is present (den sites) may adversely alter site conditions (e.g. warming, drying, soil compaction, and den disturbance). Recreation is expected to continue, and possibly increase, and would negatively impact this species. Livestock overgrazing in riparian areas degrades potential suitable habitats through trampling, sedimentation, loss of vegetation, and effects to water quality, chemistry, and temperature.

**Determination:** The proposed action **'may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing'**.

**Rationale for Determination:** Any past, present and future activities in the project area may have or may cause impact to this ground dwelling species. Impacts from road building and use in the proposed action would affect this species. Forest Plan Standards and Guidelines should be adequate to protect this species from any additional effects from the proposed action if present. While the habitat trend for the Black Hills redbelly snake appears stable across the Planning Area it has been negatively affected by recent large wildfires. The Forest appears to be conserving habitat for the redbelly snake overall, but additional effort is needed to improve riparian condition and increase acreage of aspen (USDA Forest Service 2010).

**Mountain Sucker (R2 SS & MIS)*****Direct and Indirect Effects***

This project would have no impact to the mountain sucker because it does not occur in the project area. This project is consistent with the mountain sucker MIS objective in the Forest Plan (Objective 238d) because habitat quality and stream connectivity would not be degraded.

***Cumulative Effects***

Overall, this project would have a neutral effect on the species' Forestwide population and/or habitat trend because dam modification or removal is outside the scope of this decision.

**Determination:** The modified proposed action would have **'no impact'** to this species because the species does not occur in the project area.

**Rationale for Determination:** The Forest Plan Phase II Amendment has Standards, Guidelines, and Objectives on management in riparian areas, streams, ponds, springs, and other riparian areas. Forest Plan Objective 238d would be met because habitat quality and stream connectivity would not be degraded.

**Regal Fritillary (R2 SS)*****Direct and Indirect Effects***

Direct and indirect effects may occur. However, sufficient suitable habitat is not present, so it is not expected that many regal fritillaries would be in the area. The regal fritillary butterfly overwinters as a caterpillar just beneath duff or slash on the ground. The dredging would occur during winter months when the caterpillar would be hibernating. If present, they may be crushed by equipment, or at Lakota Lake, they may be buried by placing the dredged sediment in the meadow. The adults would be flying into mid-September and may also suffer direct mortality by being crushed.

***Cumulative Effects***

Fire suppression and increase in conifer cover in grasslands and riparian areas may increase over time, negatively affecting this species. Additionally, risk of large-scale wildfire or prescribed burning may negatively affect regal fritillary habitat short-term. Livestock grazing in prairies,

upland meadows, hardwoods, and riparian zones may negatively affect this species. Prescribed burning in these areas could further reduce grasses, adding to these effects. Chemical use to control noxious weeds would decrease vegetation diversity in treated sites. Vegetation treatments may lead to more invasive weed infestations, which would lead to additional effects from chemical control. Fragmentation of habitat due to roads and trails may increase disturbance. Roads used under the proposed action may add to those disturbances temporarily. A portion of the meadows and grasslands occur on private land. Heavy livestock use, recreation, and development on private land could negatively affect butterfly habitat.

**Determination:** The proposed action **'may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing'**.

**Rationale for Determination:** Although there may be immediate adverse effects to this butterfly, if present, it is not expected that these areas are prime habitat for this species. (Forest Plan Objective 221).

### All Other R2 Sensitive Species

No critical habitat exists in the Byway Lakes Enhancement Project area for the following species: fringed myotis, Townsend's big-eared bat, hoary bat, black-tailed prairie dog, American marten, bighorn sheep, bald eagle, Northern goshawk, loggerhead shrike, grasshopper sparrow, or Cooper's mountain snail. Some of these species are likely to forage in the area during fall and winter months. Most likely in the first winter when the lakes are drained, eagles will benefit from the amount of dead fish available. Bighorn sheep may move through the area, but preferred habitat is lacking within the project area. Because suitable habitat does not exist or is not going to change from this project, a determination of '**no impact**' was made for the above species.

## **Recreation**

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### **Affected Environment**

There are no natural lakes in the Black Hills (Stewart & Thilenius 1964). Bismarck Lake and Lakota Lake dams were constructed in the late 1920's - 1930s by the Civilian Conservation Corps and Lakota Lake was completed in 1960 by the Biltmore Family as part of a planned but never completed private resort. Lakota Lake eventually became part of the Black Hills National Forest.

Some recent studies show the importance visitors place on Black Hills area lakes for recreation:

- Of 1.8 million annual visitors to Custer State Park (the second largest State Park in the nation): greater than 90% view the scenery when they drive by the lakes, 33% fish at the lakes, 10% camp at the lakes (Pugsley 2009)
- Visiting the Scenic Byway was the second most important reason why visitors came to the Black Hills Nation Forest (USDA Forest Service 2004)
- Of the 1.2 million annual visitors to the Black Hills Nation Forest: 62 % come to view wildlife, 51% come to view natural features, and 36% come to fish (USDA Forest Service 2004)
- 31,000 non-resident anglers that fished the Black Hills area in 2006 rated the two most important factors (out of 29) for selecting a good fishing spot: (1) "good water quality", and (2) "natural beauty of the area" (SDGFP 2006b).

A more detailed discussion on existing conditions for recreation at each project lake follows. Please note that the primary recreation season as discussed below relates to a mid-May to mid-September time frame annually.

### Bismarck Lake

Bismarck Lake is an important recreation resource to travelers on the nearby Peter Norbeck Scenic Byway as well as to campground users, organized youth groups staying at Camp Bob Marshall and residents of the nearby town of Custer, SD. Bismarck Lake is accessed off of State Highway 16A, through Custer State Park, which makes it a frequent recreation stop for park patrons (see Figure 7). The southeast shoreline of Bismarck Lake is the location of the Bismarck Lake Campground and Day Use Area.

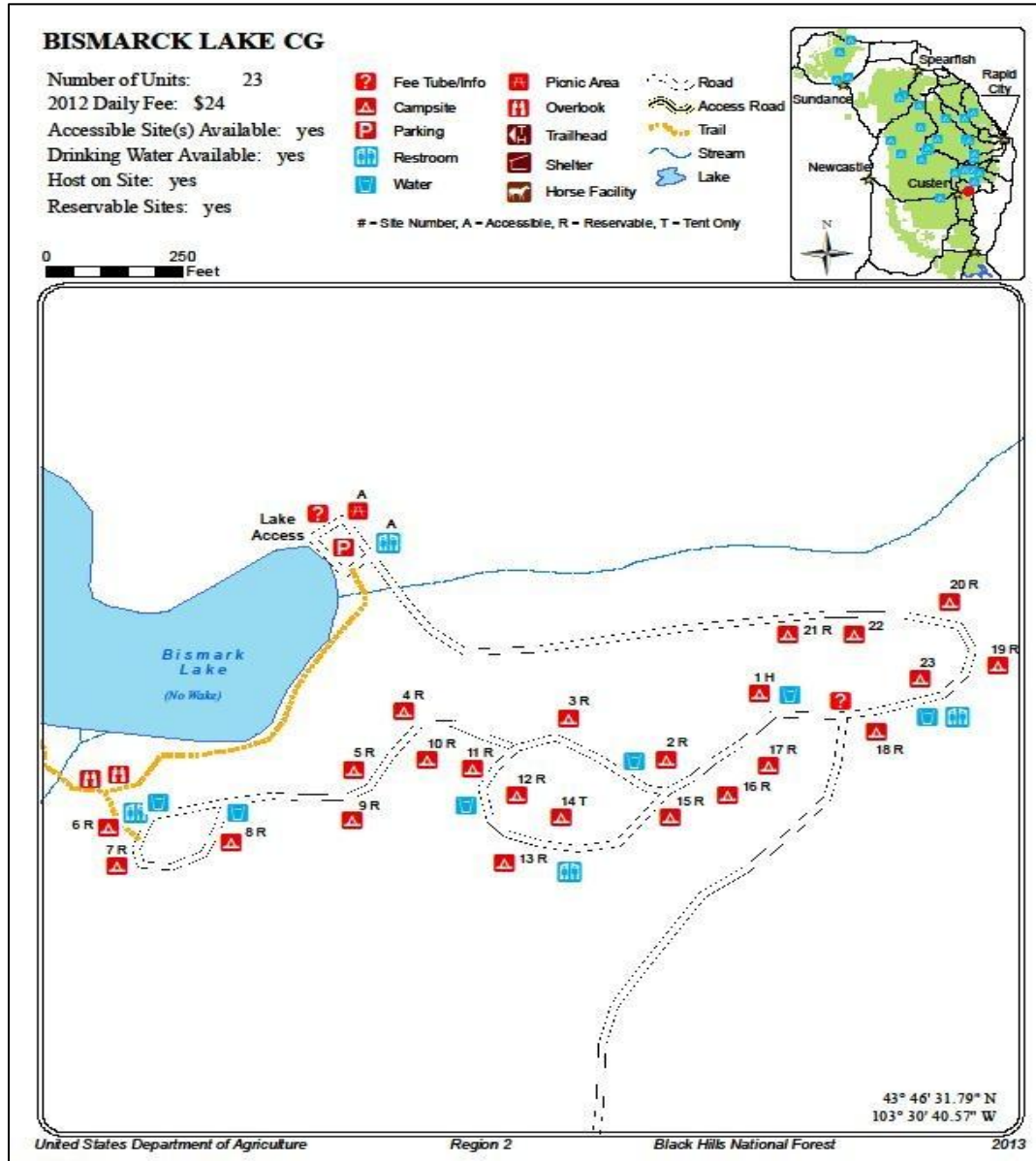


Figure 7. Bismarck Lake Campground

#### Bismarck Lake Developed Recreation Complex Campground

Bismarck Lake Campground is a semi-primitive fee-campground with outdoor vault toilets, a seasonal pressurized water system, picnic tables, fire pits and parking spurs. It has been operated and maintained for the last 15 years from mid-May to mid-September, annually, under a Forest Service administered campground concessionaire special use permit issued to the private entity, Forest Recreation Management. Based on campground receipts, the campground and associated

day use area receives high use; 55% occupancy rates during the primary summer recreation season (approximately 10,000 patrons). During the fall and spring seasons there is the occasional camper in one of the five sites available on a 'first come, first serve' basis that are located outside of the locked gate portion of the campground. There are little to no recreation services such as garbage collection or cleaning performed during the fall and spring season for campers. During winter periods there are no campers at Bismarck Lake although it is a popular weekend destination for ice fishing and some cross-country skiing and skating.

### Bismarck Lake Recreation Complex Day Use Area

This part of the Bismarck Lake Developed Recreation Complex has a small parking lot with a gravel boat landing, bulletin board, group-use picnic pad with furnishings and fire pit, vault toilet and ½ mile long accessible trail with a fishing platform from the parking lot to the campground and dam. This day use area sees high use levels during the primary recreation season as well as the fall and spring seasons. From personal observations, fishing, non-motorized boating and some swimming are the most popular activities. Shoreline hiking, bird watching and photography are other common, but less popular, recreation activities that have been observed. Small no wake boats, with the majority being canoes and kayaks, launch from the parking lot. During the winter season the day use area is the access point for local ice fishermen, cross country skiers and ice skaters making it a busy place primarily on weekends.

The condition of Bismarck Lake for quality recreation activity is poor for approximately 45% of the lake, south from the inlet stream, because of shallow water depth. Conditions worsen over the summer across the entire lake when green algae are most prolific in July and August. Verifying poor quality recreation at Bismarck Lake are issues expressed by long-time manager of Camp Bob Marshall. These issues include the current lack of water depth compared to past depth and the aquatic vegetation (i.e. cattails) is so prolific currently that it greatly reduces access to the water edge for fishing, canoeing and swimming. Cattail growth inhibits lake access especially near the day use area boat landing and the inlet stream north end, near Camp Bob Marshall.

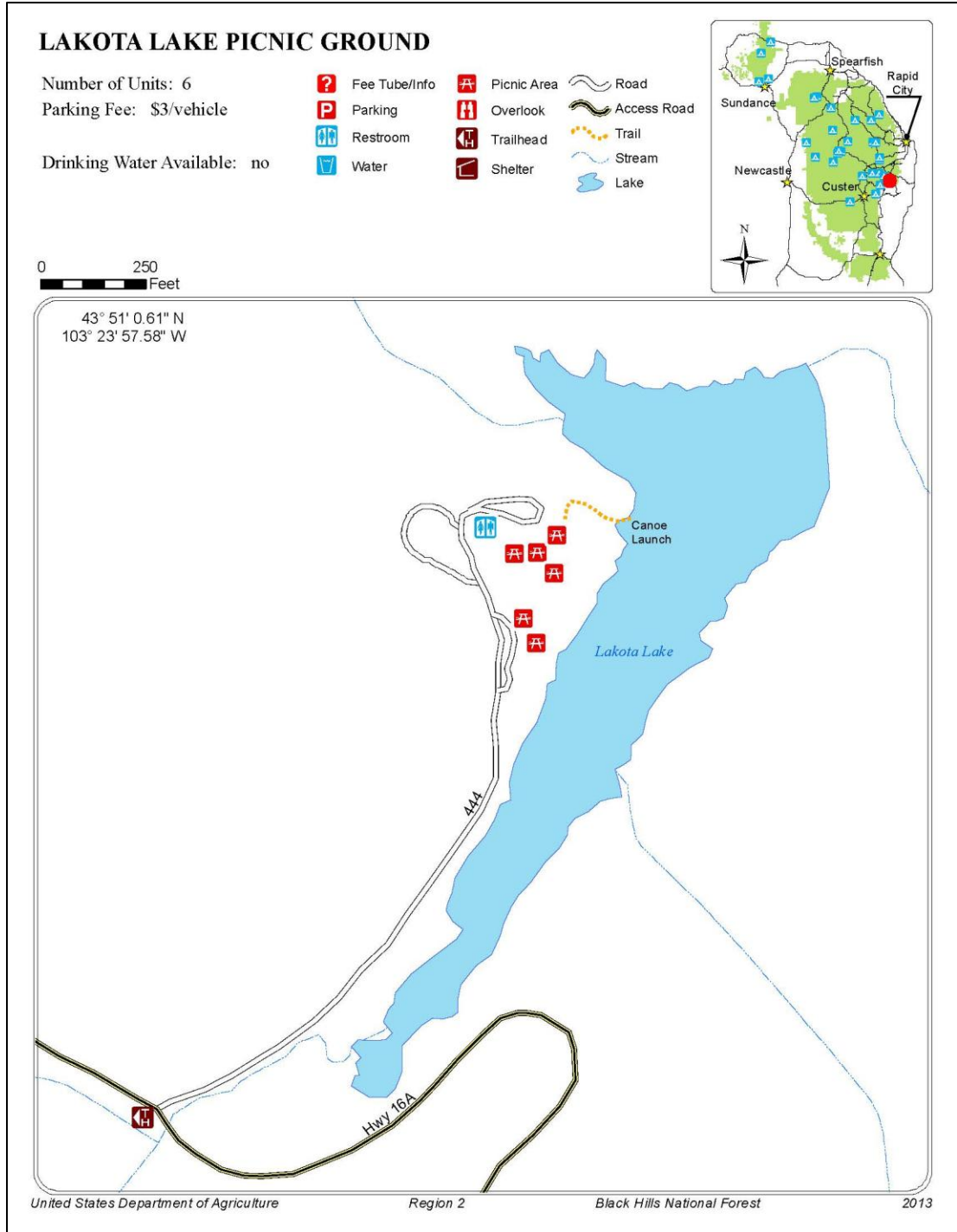
### Camp Bob Marshall

The northeast shore of Bismarck Lake is the location for the USFS owned Camp Bob Marshall, a Civilian Conservation Corps constructed overnight organizational camp. This seasonal camp is operated under an organizational camp special use permit issued by the Forest Service to the Western Dakota 4-H Camp Association. The Western Dakota 4-H operates and maintains the camp during the primary recreation season and provides mainly overnight youth centered outdoor programs. Facilities at Camp Bob Marshall are closed after mid-September, except for maintenance, and closed completely during the winter months. The camp consists of 10 rustic cabins, outdoor play areas, a group fire ring, care takers quarters, arts and crafts building, recreation hall, kitchen/dining hall and maintenance buildings. Camp users actively access the lake shore for hiking, nature studies, fishing and canoeing during their visits. Camp Bob Marshall is fully scheduled every season for group use and special use permit records indicate the camp serves an average of 2,500 patrons annually.

Outlaw Ranch, a private Lutheran outdoor camp, is located on the western shore of Bismarck Lake and also utilize the lake for hiking, nature studies and canoeing under an outfitter and guide special use permit administered by the Forest Service. Special use permit records indicate approximately 2,500 patrons from Lutheran Outdoors Outdoor Ranch visit the lake annually.

### *Lakota Lake*

Lakota Lake provides a unique recreation resource as it is located beside a busy paved US Highway 16A, but is still bit off the "beaten path" and down a gravel access road (see Figure 8). As such it offers respite to travelers particularly during high summer traffic periods.



**Figure 8. Lakota Lake Picnic Ground**

Lakota Lake Picnic Ground

Lakota Lake picnic ground is located on the western shore of the lake. It consists of a gravel access road (NFSR444), gravel parking lot, picnic tables, vault toilet and carry down canoe launch. The parking area consists of two drive-through loops; one meant for larger vehicles, primarily horse trailers, for the nearby Iron Creek Trail, and a separate four car parking area. This day use recreation site experiences moderate use during the primary recreation season and occasional winter use for ice fishing. From personal observation the most popular activity during

the summer is fishing primarily from the picnic ground shoreline and small, non-motorized boating.

The condition of Lakota Lake for quality recreation activity is poor for approximately half of the lake, nearest the inlet stream where sediment deposits are the greatest. From personal experience it is near impossible in this area of the lake to fish due to the shallow water depth, green algae blooms, seemingly “bottomless” mud and prolific cattail growth. The north end (the dam) of the lake provides deeper and less algae-filled water and is the most popular area for fishing, small non-motorized boat use, and some swimming.

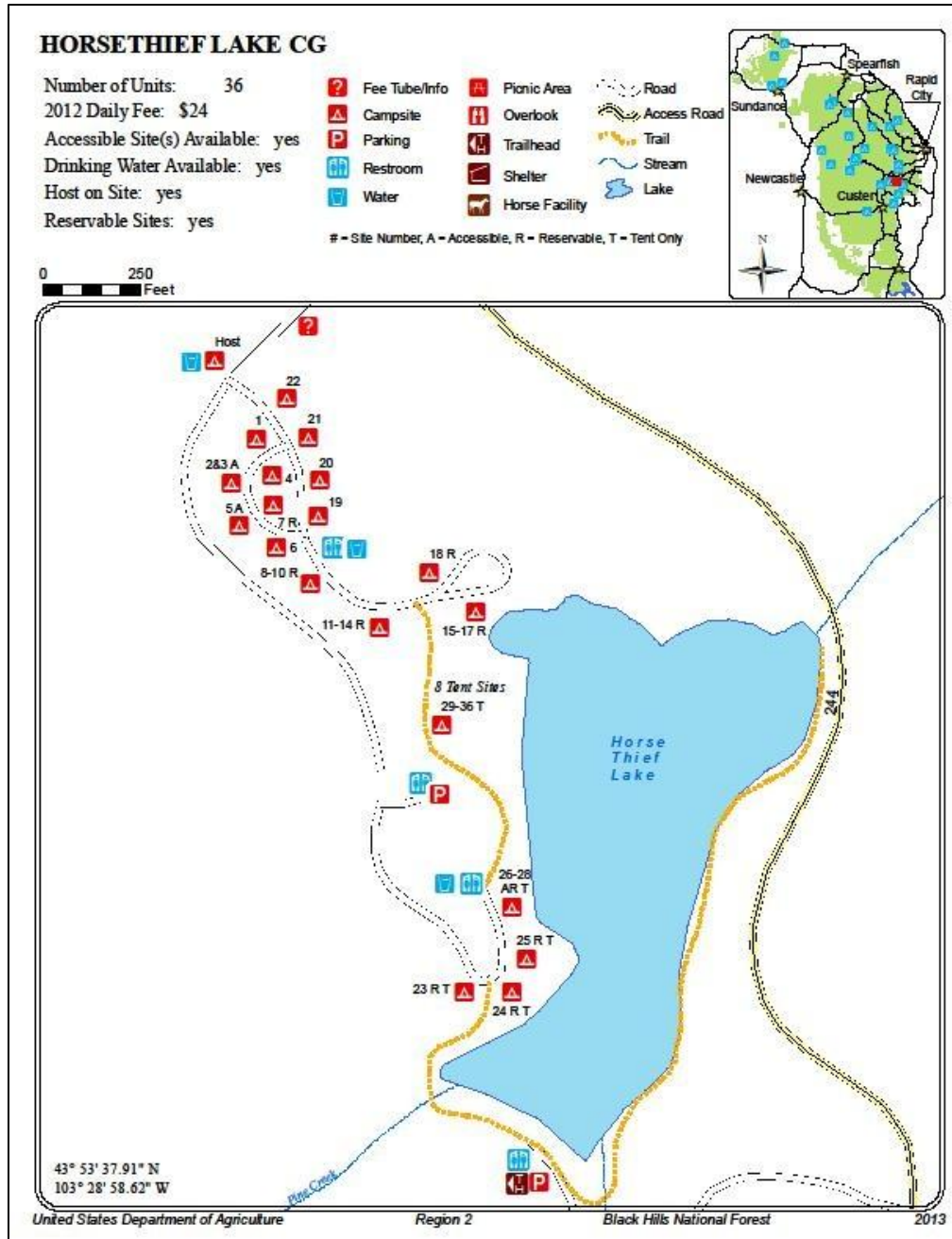
### *Horsethief Lake*

According to campground receipts Horsethief Lake is the busiest recreation use lake on the Black Hills National Forest during the summer months (see Figure 9).

#### Horsethief Lake Campground and Day Use Fishing Access Site

Horsethief Lake developed recreation site consists of a 36 site campground located on the west shore and a day use fishing access site on the southeast shore with a parking area, toilet, and accessible shoreline trail & fishing platforms. Near the fishing access day use site is a small three vehicle parking area for the Horsethief Lake Trail #14 trailhead. This trail almost immediately enters Black Elk Wilderness after leaving the trailhead.

The semi-primitive Horsethief Lake Campground amenities include campsite furnishings, fire pits, vault toilets and a pressurized water system. From camping receipts this campground has the highest occupancy rate, approximately 80%, during the primary recreation season for the entire Black Hills National Forest. From personal observation, the day use area parking lot is full most afternoons during the summer, primarily with small family fishing groups. The gravel access road to the day use fishing access site and the Horsethief Trail #14 trailhead is a separate entrance off of Highway 244 from the nearby campground. The day use area receives moderately high use during the fall and spring recreation seasons, primarily for fishing. The day use area receives low use during winter months mostly for weekend ice fishing. It is suspected that most users of the day use area are Scenic Byway travelers going to or from Mt. Rushmore National Memorial located just a few miles to the east along Highway 244.



**Figure 9. Horsethief Lake Campground**

From personal observation at Horsethief Lake, the quality of recreation opportunities have been most impacted by increased growth of near-shore cattails and foul smelling green algae blooms during the warmer summer months. Lake fishing access is severely restricted or impossible from cattail growth particularly at the south end of the lake where fishing platforms are located. These fishing platforms were designed to provide accessible fishing opportunities to the disabled but this is now impossible due to prolific cattail growth by mid-summer.

*Project Area Special Use Permits*

US Forest Service Camp Bob Marshall and private camp, Lutherans Outdoors in South Dakota, Outlaw Ranch, both have recreation special use permits on Bismarck Lake. These are the only

recreation special uses in the project area. Outlaw Ranch has been issued an Outfitter & Guide special use permit for canoeing, hiking and leading nature study classes on and around Bismarck Lake. Western Dakota 4-H Camp Association has been issued an Organizational Camp special use permit for operating and maintaining Camp Bob Marshall.

## **Environmental Consequences**

### **ALTERNATIVE 1 – NO ACTION**

The No Action Alternative assumes that no implementation of any elements of Alternative 2 – Modified Proposed Action would take place within the project area. However, such things as ongoing recreation use and facilities maintenance would continue as directed by the Forest Plan.

#### ***Direct and Indirect Effects***

Existing sediment would remain in the lakes and continue to accumulate thereby reducing the quality of the water resource particularly over time. Negative effects of sediment filled impounded lakes include algae blooms, foul smells, increased shoreline vegetation growth due to shallower depths especially cattails and poor quality fish habitat to include shallow, warmer water and less dissolved oxygen for fish survival. This in-turn would not provide the quality of recreation services that the public would want. The specific services provided that would be negatively impacted are campgrounds, organizational youth camp, swimming, hiking, nature studies, picnicking, boating, outfitter and guides (Outlaw Ranch) and fishing that occur at project lakes. The effect may be particularly negative for wheelchair bound recreationists who have more restricted access to the shoreline and water due to vegetation growth around handicap accessible boardwalks and fishing platforms. Areas of shoreline erosion repair would not be accomplished. This could cause shoreline erosion to continue and perhaps worsen over time. The Peter Norbeck National Scenic Byway traveler's experience of lakeside recreation opportunities would remain degraded and could worsen over time as lakes continue to age.

### **ALTERNATIVE 2 – MODIFIED PROPOSED ACTION**

#### ***Direct and Indirect Effects***

##### ***Short Term Effects (1 year or less)***

This alternative would have little or no impact to the operation of developed recreation sites such as Camp Bob Marshall, Bismarck Lake Recreation Complex, Lakota Lake Picnic Ground or Horsethief Lake Campground and Fishing Access Day Use Site. These recreation sites are closed during the timing proposed for the drawing down and dredging of the lakes. Refilling the lakes occur over approximately 4-6 weeks (end of June) based on hydrology estimates. The effect would be relatively short, approximately 4-6 weeks from the start of the primary recreation season which begins mid-May. The fall and spring recreation seasons would be effected, short term, due to the lack of water. This would impact water based recreation activities such as fishing, canoeing, kayaking and swimming during the refill process due to lower than full water levels in lakes. This effect would be reduced incrementally in a relatively short period of time as natural recharging of lakes occurs.

Shore line recreation activities such as hiking and nature studies would have short term effects. Mostly noise from operating construction equipment; however shorelines would not be effected by the machinery except at entry and exit points proposed for each lake.

Shoreline vegetation growing in water and sediments areas, primarily cattails, would be removed except for the wildlife exclusion areas. Removing cattails could decrease opportunities for bird watching for species such as black winged black birds, at these locations. Shoreline areas being repaired with native rock would be temporarily closed to the public. The effects to winter



recreation users at these lakes for activities such as ice fishing and ice skating during draining and dredging would be short term because the lakes would be re-filled by the following season. These short term effects could cause winter recreation lake users to utilize other nearby lakes such as Center Lake, Sheridan Lake or Stockade Lake for winter activities. Project activities are proposed to be staggered over a two year period with Horsethief Lake proposed as the first lake for dredging. Therefore at least one of the three project lakes would be available for recreation use during the draining and dredging processes.

Roads within recreation sites would be minimally affected. Activities would occur during non-public use and during the frozen winter months. In addition design criteria would protect roads and facilities within recreation sites. The effects to public recreation traffic on open roads and highways would be short term and minimal as only 0.70 miles of paved Highway 244 is proposed to be used for hauling sediment and it would occur during the low use winter months. Other roads to be used are located within recreation sites that are normally closed or would be closed during low recreation winter use periods.

Sediment deposit sites would have a minimal short term effect on recreation resources because proposed locations are not within recreation sites and would be reclaimed back to a natural setting within a year's time. Relocating approximately 1,000 ft section of the Centennial Trail 89 from a native surface road to a new constructed section of trail on adjacent forest land for the Horsethief Lake gravel pit sediment deposit site would have a positive effect on trail resources as it would meet a primitive, narrow trail standard versus a road. This new section would be constructed before the gravel pit is filled with lake sediment and recreation users would be subject to a minor disturbance of noise and disturbance caused by a 4-6 person trail crew using hand tools to make trail tread.

#### *Long Term Effects (greater than 1 year)*

All effects long term are positive to the recreation resource for this project. The project lakes would not be as likely to experience algae blooms during summer months. This improves water quality making it clear and not foul smelling for lake users and nearby campers. In addition, lake depths would be increased making more areas of each lake more accessible for boats, canoes, float-tube fly fisherman without them hitting muddy bottoms. Removing cattails and providing deeper water in near shore areas would allow water access by all recreation users including handicap accessible fishing platforms. Centennial Trail 89 users would have a more quality hiking experience on a primitive standard trail section versus a 16 foot wide native surface road section through the Horsethief Lake gravel pit. Developed recreation sites would have a more quality water resource for all users, including nearby towns, Scenic Byway travelers, campers, nature watchers, fishermen, etc. The primary activity of fishing at these lakes would be improved with an increase in the quality of fishery habitat and quantity of the fishery including more and larger fish surviving winter due to increased dissolved oxygen levels and water depths. Increased forage on reclaimed sediment sites could result in improved wildlife viewing opportunities, particularly for open meadow/hardwood species.

### **Cumulative Effects**

Cumulative effects would result from the incremental impact, either positive or negative, of this project when added to past, present and reasonably foreseeable actions. The cumulative effects analysis area is bounded in space as the three lakes and shorelines, the sediment disposal sites and the truck haul routes to access the sediment disposal sites. The cumulative effects are bounded in time as the next 20-50 years, though many of the disturbance effects tied to dewatering and dredging activities will be more short-term in nature.

The most obvious cumulative effect is the long-term, positive improvement to the quality of the lake water resource itself and its effect on recreation resources. Improvements to the recreation

resource environment by improving water quality and removing lake sediments on project lakes benefits visitors to Forest Service campgrounds and adjacent day use recreation sites, Scenic Byway travelers, nearby communities, and organizations such as Camp Bob Marshal and private Outlaw Ranch campers. An improved resource condition of project lakes improves the quality of the outdoor recreation experience for a variety of lake and shoreline based recreational activities.

## Botany

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### Affected Environment

A botanical survey was completed in 2003 (Norbeck/Iron Mountain Botanical Survey) for the Lakota and Horsethief Lake sites and in 2006 (Vestal Botanical Survey) for the Bismarck Lake site to collect information related to plant communities, assess sensitive species habitat, and identify locations of target plant species (sensitive species, state-listed species, and species of local concern). Project specific areas were resurveyed in the fall of 2012 to determine if suitable habitat was present for sensitive plant species. Other recent botanical surveys have been completed adjacent to the project area. Surveys would be ongoing within the project area.

Typically, high potential sensitive species habitat is surveyed along with a proportion of low potential habitat. These surveys are generally intuitively controlled. Normally, high potential sensitive plant habitat on the Hell Canyon Ranger District is considered to be sites with additional moisture, including but not limited to: lower slopes and drainage bottoms adjacent to and within riparian areas and draws (especially north trending), north to east facing slopes, springs and seeps, communities with a strong component of or dominated by aspen (*Populus tremuloides*), white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), and rock outcrops. Low potential habitat on the Hell Canyon Ranger District consists of drier sites, such as ponderosa pine (*Pinus ponderosa*) sites, ridge tops, and meadows with non-native plants.

**South Dakota state listed species** are plant species that have been identified as rare in the state of South Dakota. The state has identified these plants for tracking by the South Dakota Natural Heritage Program. There are no known occurrences of these species.

### *Plant Species of Local Concern (SOLC)*

There are no known occurrences of SOLC within the project area. Potential habitat exists adjacent to the projected disturbance areas but no potential habitat exists within these areas. Four SOLC species (*Botrychium multifidum*, *Carex bella*, *Oxyria digyna*, *Petasites frigidus* var. *sagittatus*) were initially considered for analysis, but were subsequently dropped due to lack of potential habitat. The lake dredging itself would have no effect to any sensitive plant species or habitat. The haul routes are on existing roads and the sediment deposit sites either occur in old gravel/borrow pits or in meadows that are dominated by smooth brome (*Bromus inermis*). None of which are potential habitat for SOLC.

Suitable habitat for species not known to occur within the project area was based upon general habitat characteristics, proximity to known populations, and professional judgment. The project area contains a significant amount of habitat that was altered during post-settlement times (e.g. mining, hay fields, homesteads, etc.)

No further analysis is needed for species that are not known or suspected to occur in the project area, and for which no suitable habitat is present. For a complete list of all known Forest Service SOLC to occur on the Black Hills National Forest see the Botany BA/BE.

### *Region 2 Sensitive Species (R2 SS)*

A pre-field review was conducted of available information to assemble occurrence records, describe habitat needs and ecological requirements, and determine whether field reconnaissance

is needed to complete the analysis. Sources of information included botanical surveys, Forest Service records and files, local professional judgment, and published research.

Potential habitat exists adjacent to the projected disturbance areas but no potential habitat exists within these areas. Two species (*Cypripedium parviflorum*, *Viola selkirkii*) were initially considered for analysis, but were subsequently dropped from analysis due to lack of potential habitat.

The lake dredging itself would have no effect to any sensitive plant species or habitat. The haul routes are on existing roads and the disposal sites either occur in old gravel/borrow pits or in meadows that are dominated by smooth brome (*Bromus inermis*). None of which are potential habitat for R2 sensitive plant species.

There are no known R2 sensitive plant species that have been located within the project area and no known potential habitat exists for any of these species; consequently, no further analysis is needed. However, there is a remote chance unknown individuals may exist within the project area. Therefore, the following determination is valid: **“May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend for federal listing.”**

## **Environmental Consequences**

### *South Dakota State Listed Species & SOLC*

Effects to all are similar and are analyzed together.

#### ALTERNATIVE 1 – NO ACTION

##### *Direct and Indirect Effects*

Alternative 1 is the No Action alternative. No new proposed activities would occur in the project area. There are no known populations of sensitive plant species or potential habitat within the project area. Under the No Action alternative there would be no possibility for restoration of the sediment deposit sites that could be future potential habitat. There are also no additional risks to any unknown sensitive plant species or their habitat from disturbance activities associated with the project.

#### ALTERNATIVE 2 – MODIFIED PROPOSED ACTION

##### *Direct and Indirect Effects*

There are no known populations of sensitive plants within the project area. There is no potential habitat within the areas that will be disturbed. Therefore, there would be no effects to sensitive plant species or potential habitat.

The sediment deposit sites and disturbed areas under Alternative 2 would be restored using native plant materials. The sediment deposit sites are currently dominated by smooth brome (*Bromus inermis*) or are past gravel or borrow pits that currently do not provide potential habitat. Restoring these sites may create future potential habitat for sensitive species.

There is a risk of spreading noxious weeds or possibly introducing new noxious weeds. Design criteria are in place to treat noxious weeds (and retreat as necessary) and to clean any incoming equipment. Disturbed areas would be monitored for noxious weeds.

## **Cumulative Effects**

The cumulative impact area for this analysis is the identified project area. Activities beyond the project area have a diminished effect on botany resources as well as the noxious weeds within the

project area. The timing limit for the cumulative effects analysis is estimated at 20 years, 10 years prior to present and 10 years into the future, which allows for an adequate length of time to record vegetative changes.

Past, present and reasonably foreseeable activities within the project area include timber harvest, timber thinning, wildfire, prescribed burning, grazing, road construction and maintenance, noxious weed control, wildlife habitat improvement projects, and dispersed recreational use on both the public land and private land in the area. A list documenting known past and planned future activities for this area is included in the project record.

Noxious weed infestations are expected to increase under the action alternative. Anywhere there has been some form of soil disturbance, the potential for the establishment of noxious weeds exists. The potential for noxious weed establishment is even greater in disturbed areas adjacent to existing weed populations. The movement of equipment in and out of these areas also facilitates weed establishment. Roads create a network of corridors through which seed dispersal can occur.

The spread of noxious weeds and other exotic plants can be detrimental to SOLC and state listed plant species, as invasive species have the ability to out-compete desired native plants. The herbicides used in noxious weed control can also be detrimental to SOLC and state listed species if the individuals are inadvertently exposed to the herbicides.

All of the above uses are limited in intensity and duration and therefore when combined with the alternatives analyzed, including the no action alternative, do not result in cumulative impacts to the SOLC and state listed species or their habitat.

## Scenery

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### Affected Environment

From a scenery standpoint Horsethief Lake, Bismarck Lake and Lakota Lake along the Peter Norbeck Scenic Byway are some of most scenic areas in the Black Hills National Forest. Nearby Custer State Park and Mount Rushmore National Monument attract approximately 4 million visitors to this area. Mount Rushmore National Monument received 2.4 million visitors in 2008 (Reynolds 2009), and Custer State Park reports 1.7 million visitors annually (Pugsley 2009). As a result, the project lakes receive some of the heaviest public use on the Forest – from visitors driving along the Peter Norbeck Scenic Byway and observing these lakes to recreational boating, camping, fishing, and otherwise enjoying the scenic beauty at these locations.

These lakes are highly valued by the public for their scenic beauty and the recreation opportunities they provide. These areas have been managed to meet a High Scenic Integrity Objective (SIO). Most constructed features have blended into the landscape. However, in one instance in particular, where limestone rocks were placed along the shore line, the light color of the limestone was in strong contrast to the native rock around Horsethief Lake.

Scenic Integrity Objectives (SIO) are management objectives that were adopted from the scenic class values. Scenic Integrity is a measure of the degree to which a landscape is visually perceived to be “complete”. The highest scenic integrity ratings are given to those landscapes that have little or no deviation from the character valued by constituents for its aesthetic appeal. (USDA Forest Service 1995)

## **Environmental Consequences**

### **ALTERNATIVE 1 – NO ACTION**

#### ***Direct and Indirect Effects***

None of the proposed activities would take place. Existing conditions would continue; the natural processes of sediment being deposited into the lakes and aquatic plants (i.e. cat tails) growing into the shoreline would continue.

Short term the visible effect may be limited when viewed from the Scenic Byway. When viewed from the campgrounds and trails along the lake shores the continued growth of cattails would create an ever increasing buffer between the viewer and the water, diminishing the visual enjoyment. In addition, the associated recreation opportunity would also diminish.

Long term effects would be the continued buildup of sediment over time, in addition to the existing sediment load from the past 50-70 years (depending upon the lake) would diminish the size of the lakes and continue to decrease lakeside viewing opportunities.

### **ALTERNATIVE 2 – MODIFIED PROPOSED ACTION**

#### ***Direct and Indirect Effects***

The only visible disturbance along the lake shore would be at the access points. For Horsethief Lake an area of shoreline shrubs would need to be removed at the end of the campground road for access by heavy equipment during dredging work. Lakota Lake and Bismarck Lake access points for heavy equipment only have grass. Some ground disturbance would occur at the lake access points, but the sites would be returned to the original contours and seeded with a native grass seed-mix when complete.

Rocks would be placed along the lake edge to ensure the shore is stabilized. In addition, this would reduce potential erosion from pedestrian traffic along the lake shore. Some rocks would be large enough to provide potential recreation opportunities (wildlife viewing, fishing, etc.). The project should improve the fisheries habitat resulting in more recreational fishing opportunities, more wildlife viewing opportunities and provide more scenic viewing opportunities. The rocks would come from the immediate area to ensure the color of the rocks are consistent in color with the rock outcrops evident around the lakes - when viewed from various locations. Past rock placement used to stabilize the Horsethief lakeshore that was not native to the local area and a different color, would be removed or covered over with new native rock. Removed non-native rock may be incorporated in a location where it is no longer visible.

Slash from clearing the non-commercial size pine encroachment in the proposed sediment deposit sites would be chipped and piled for use as mulch to help re-establish vegetation. At the completion of the project, a High SIO should be achieved.

A 'driving surface' of protective gravel would be placed over the asphalt roads within Horsethief Lake Campground and then removed at the completion of the project. Other haul roads would receive a final level of road maintenance including adding new gravel, repairing any rutting, and seeding road edges as necessary. There should be no residual evidence of hauling sediments at the completion of the project.

All proposed sediment deposit sites would be rehabilitated and returned to a natural appearing condition. The rehabilitation of the two sediment deposit sites that were gravel pits would reduce the appearance of human intrusion and help maintain a more 'natural appearance'.

## **Cumulative Effects**

The boundary on the ground for analyzing cumulative effects is primarily that of the project planning area. This identified area is the landscape that is evident in the foreground and middle ground from the main travel routes, with particular attention to recreation facilities and the Peter Norbeck Scenic Byway. The time boundary for this analysis extends from the current time to 50-70 years in the future. This is essentially equal in time to the when the lakes were originally built and the amount of sediment that has filled in during this time.

Under the No Action alternative, the lakes would continue to see sediment build up equal to the amount that has occurred over the past 50-70 years. This would reduce the visibility of the lakes from the Scenic Byway, campgrounds and other viewing areas, and continue the reduction in recreation opportunities, such as boating and fishing.

Under the Modified Proposed Action alternative it would move the visual appearance of the project lakes back toward their original condition while maintaining opportunities to view wildlife and a natural appearing shoreline. The removal of sediment would improve the visual appearance, and potentially ensure there would still be lake-oriented recreational opportunities for the coming 50-70 years.

## CHAPTER 4: CONSULTATION and COORDINATION

The Forest Service consulted the following: individuals, Federal, State, and local agencies, Tribes, and non-Forest Service persons during the development of this environmental assessment.

### Interdisciplinary Team (IDT) Members

#### **Lynn Kolund**

District Ranger – Bachelor of Science, Forest Biology, Colorado State University, 1978. Thirty-one years of Forest Service experience in timber, silviculture, recreation, wilderness, fire and lands. Worked on seven districts and two Supervisor’s offices on six National Forests in Wyoming, Colorado, Alaska and South Dakota.

#### **Kelly Honors**

District NEPA Coordinator – Bachelor of Science, Forestry, State University of New York, College of Environmental Science and Forestry, 1985. Twenty six years of Forest Service experience at the district level in timber and planning; twenty-three of those years on the Black Hills National Forest. Twenty-two years of experience in writing NEPA documents.

#### **Paul Bosworth**

Civil Engineer. Bachelor of Science, South Dakota School of Mines and Technology. Twenty nine years of experience designing and administering contracts for roads, trails, and bridges on the Black Hills National Forest.

#### **Steve Hirtzel**

Fisheries Biologist. BS Wildlife & Fisheries Science, South Dakota State University, Brookings, SD 1987. Twenty four years of experience in research, regulatory and natural resource management programs with various state and federal agencies, the past eleven years on the Black Hills National Forest.

#### **Amy Schlosser**

Archeology Technician. BS Anthropology with a Minor in Biology from Grand Valley State University, 2007. Four field season as a temporary Archeological Technician for the Black Hills National Forest (2007-2010). Two full years as a permanent Archeological Technician on the Black Hills National Forest (2011-Present) and two years as a BAER archeologist. USFS experience in South Dakota and Wyoming.

#### **Matthew Scott**

Botanist- B.S. Rangeland Ecology and Watershed Management; Minor, Reclamation and Restoration Ecology; Extensive coursework in soils and botanical sciences, 2006. Three years of experience fuels, wildland and prescribed fire management. Four

years of experience as a Natural Resource Specialist for Laramie Rivers Conservation District focused in rangeland management, vegetation monitoring, and wildlife habitat management. Qualified for OPM 430 Series (Botanist) in 2010. Hell Canyon Ranger District Botanist on the Black Hills National Forest since March, 2010.

**Jamie Wheeler**

Wildlife Biologist. BS Biology, St. Norbert College, DePere, WI, 1999. MS Wildlife & Fisheries Sciences, South Dakota State University, Brookings, SD, 2007. Has worked 2 years at Wind Cave National Park on coyotes & reintroduction of the endangered black footed ferrets. Has been a Forest Service Wildlife Biologist at the District Level since 2007.

**Matthew Padilla**

Archaeologist-Archaeologist- Master of Arts in Anthropology and Minor in GIS from New Mexico State University, 2006. Bachelors of Arts in Anthropology from Kansas State University, 2003. Three field seasons as an Archaeological Technician for the Black Hills National Forest (2002, 2004, 2005). One year as a SCEP archaeologist on the Plumas National Forest (2006). Four years of Forest Service experience as an Archaeologist at the district level, six years as a fire archaeologist, and five years as a BAER archaeologist. USFS experience in California and South Dakota.

**David Pickford**

Recreation Specialist. BA Outdoor Recreation, Eastern Washington University, 1984, Cheney, WA. Twenty three years of Forest Service experience with the last 12 years on the Black Hills National Forest as a Recreation Specialist at the District level. Sixteen years outdoor recreation experience with other federal agencies in various locations in the country.

**Leslie Gonyer**

South Zone Hydrologist. BS Forestry, Minor in Hydrology, University of Minnesota, 1977. 36 years of Forest Service experience at the District and Forest levels in Utah, New Mexico, Oregon, Idaho, Wyoming, California, and South Dakota in watershed, timber, special uses, minerals, fire, engineering, and environmental analysis. BAER (Burned Area Emergency Response) Team.

**Stephen Keegan**

Forest Landscape Architect - Bachelor of Science, Landscape Architecture & Environmental Studies, State University of New York (SUNY) - College of Environmental Science and Forestry, 1980; Bachelor of Science, Syracuse University 1980; Associates of Arts, Humanities, SUNY - Onondaga Community College,



1978. Twenty-eight years of Forest Service experience at the Forest and Zone level on the Helena, Clearwater, Malheur & Black Hills National Forests. Of which twenty-one years have been as a Landscape Architect conducting Scenic Resource Assessments for: vegetation and fuels management, watershed analysis, utility & facility construction, wild & scenic rivers, scenic byways, and burned area emergency rehabilitation.

### **FEDERAL, STATE, AND LOCAL AGENCIES:**

Custer County Commissioners  
Custer Chamber of Commerce  
City Of Custer  
Hill City Chamber Of Commerce  
Keystone Chamber Of Commerce  
Mount Rushmore National Monument

South Dakota Environmental Review & Management  
South Dakota Department of Environment and Natural Resources  
South Dakota Game, Fish & Parks  
South Dakota Department of Transportation  
US Environmental Protection Agency

### **TRIBES:**

Cheyenne-Arapaho Tribes of Oklahoma  
Cheyenne River Sioux Tribe  
Crow Creek Sioux Tribe  
Eastern Shoshone Tribe  
Flandreau Santee Sioux Tribe  
Grey Eagle Society  
Kiowa Ethnographic Endeavor for Preservation  
Lower Brule Sioux Tribe  
Mandan Hidatsa & Arikara Tribes

Northern Arapaho Tribe  
Northern Cheyenne Tribe  
Oglala Sioux Tribe  
Rosebud Sioux Tribe  
Santee Sioux Nation  
Sicangu Lakota Treaty Council Office  
Sisseton-Wahpeton Sioux Tribe  
Spirit Lake Sioux Tribe  
Standing Rock Sioux Tribe  
Yankton Sioux Tribe

### **ORGANIZATIONS, GROUPS AND BUSINESSES:**

Biodiversity Conservation Alliance  
Black Hills Badlands & Lakes Association  
Black Hills Sierra Club  
Black Hills Sportsmen  
Dakota Anglers  
Friends of the Norbeck  
Forest Recreation Management  
Homestake Mining Corporation

Lutherans Outdoors in SD  
Native Ecosystems Council  
Pacer Corporation  
Prairie Hills Audubon Society  
Recreational Adventures Co.  
Rushmore Resort & Campground  
Western Dakota 4H Camp Association

### **INDIVIDUALS:**

Katus, Jean

## CHAPTER 5: LITERATURE CITED

- Administrative Rules of South Dakota (ARSD). Antidegradation of waters of the state. South Dakota Legislature, Administrative Rules. Online:  
<http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:51:01:34&Type=Rule>.
- Administrative Rules of South Dakota (ARSD). Beneficial uses of South Dakota streams to include irrigation and fish and wildlife propagation, recreation, and stock watering. South Dakota Legislature, Administrative Rules. Online:  
<http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:51:03:01&Type=Rule>.
- Anderson, T. 2002. Conservation assessment for the American dipper in the Black Hills National Forest, South Dakota and Wyoming. United States Department of Agriculture-Forest Service, Rocky Mountain Region, Black Hills National Forest. Custer, South Dakota. Online: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm9\\_012057.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_012057.pdf)
- Anderson, T. 2003. Conservation assessment of woodpeckers in the Black Hills National Forest. United States Department of Agriculture-Forest Service, Black Hills National Forest, Custer, South Dakota. 176 pp. Online:  
<http://www.fs.fed.us/r2/blackhills/projects/planning/assessments/woodpeckers.pdf>.
- Beason, J., K. Hutton, A. Panjabi, R. Sparks, and D. Hanni. 2006. Monitoring the birds of the Black Hills: 2005 field season report. Technical Report: M-MBBH05-01. Rocky Mountain Bird Observatory, Brighton, Colorado. 113 pp.
- Bonnot, T.W., M.A. Rumble, and J.J. Millspaugh. 2008. Nest success of black-backed woodpeckers in forests with mountain pine beetle outbreaks in the Black Hills, South Dakota. *The Condor* 110: 450-457.
- Cryan, P., and L.E. Ellison. 2005. Distributional survey of the meadow jumping mouse (*Zapus hudsonius*) in the Northern Great Plains: trapping report, summer 2005. Progress Report, compiled for the United States Fish and Wildlife Service, Region 6, Denver, Colorado. September 2005.
- DeGraaf, R.M., V.E. Scott, R.H. Hamre, L. Ernst and S.H. Anderson. 1991. Forest and rangeland birds of the United States, natural history and habitat use. United States Department of Agriculture-Forest Service, Agriculture Handbook 688. 625 pp.
- Frison, George C. 1991. Prehistoric Hunters of the High Plains. Academic Press, New York.
- Goodman, Ronald. 1992. Lakota star knowledge: Studies in Lakota stellar theology. Second Ed. Sinte Gleska University. Mission, South Dakota.
- Griebel, R., K. Burns, and S. Deisch. 2007. Focus Species, Norbeck Wildlife Preserve, Black Hills National Forest. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota.
- Higgins, K.F., E.D. Stukel, J.M. Goulet, and D.C. Backlund. 2000. Wild mammals of South Dakota. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota. 278 pp.
- Isaak, D.J., W.A. Hubert, C.R. Berry, Jr. 2003. Conservation assessment for lake chub, mountain sucker, and finescale dace in the Black Hills National Forest, South Dakota and Wyoming. United States Department of Agriculture-Forest Service, Rocky Mountain Region, Black Hills National Forest. Custer, South Dakota. Online:  
[http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm9\\_012156.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_012156.pdf).

- Kennedy, P.L. 2003. Northern goshawk (*Accipiter gentiles atricapillus*): A technical conservation assessment. United States Department of Agriculture-Forest Service, Rocky Mountain Region. Online: [www.fs.fed.us/Region2/projects/scp/assessments/northerngoshawk.pdf](http://www.fs.fed.us/Region2/projects/scp/assessments/northerngoshawk.pdf). Accessed January 2, 2003.
- Kerby, J. 2011. Prevalence of an emerging disease in South Dakota amphibian populations. South Dakota Department of Game, Fish and Parks, Wildlife Diversity Grant – Final Report.
- Lehman, C.P. 2005. Ecology of Merriam's turkeys in the southern Black Hills. South Dakota. Ph.D. dissertation, South Dakota State University, Brookings, South Dakota.
- Marrone, G.M. 2002. Field guide to butterflies of South Dakota. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota. 478 pp.
- Marrone, G.M. 2006. A butterfly survey of the southern Black Hills and adjacent areas with emphasis on species monitored by the South Dakota Natural Heritage Program. Report submitted to: South Dakota Department of Game, Fish and Parks. Pierre, South Dakota. 36 pp.
- NatureServe. 2012. NatureServe Explorer: an online encyclopedia of life [web application]. Version 7.1. NatureServe. Arlington, Virginia. Online: <http://www.natureserve.org/explorer>. Accessed-March 2013.
- Panjabi, Arvind. 2001. Monitoring birds of the Black Hills: Year 1. Final Report. Rocky Mountain Bird Observatory, Fort Collins, Colorado. 96 pp.
- Panjabi, Arvind. 2003. Monitoring birds of the Black Hills: Year 2. Final Report. Rocky Mountain Bird Observatory, Fort Collins, Colorado. 125 pp.
- Pugsley, Craig. 2009. Dreams, vacations, people make a park. South Dakota Conservation Digest, May/June 2009 edition. Pierre, SD. Pgs. 18-21.
- Reynolds, Christopher. 2009. What a blast: fun facts about Mount Rushmore. Los Angeles Times. Online: [http://www.contracostatimes.com/travel/ci\\_12692363](http://www.contracostatimes.com/travel/ci_12692363).
- Richardson, A.H. 1971. The Rocky Mountain goat in the Black Hills. South Dakota Department of Game, Fish and Parks. Bulletin Number 2. 24 pp.
- Rom, Lance, Tim Church and Michele Church. 1996. Black Hills National Forest cultural resources overview. Ms. on file at the Black Hills National Forest, Supervisor's Office. Custer, South Dakota.
- Royer, R.A. and G.M. Marrone. 1992. Conservation status of the regal fritillary (*Speyeria idalia*) in North and South Dakota. Rep. to the U.S. Department of Interior, Fish and Wildlife Service, Denver, Colorado. 44 pp.
- Rumble, M.A., and S.H. Anderson. 1993. Macrohabitat associations of Merriam's turkeys in the Black Hills, South Dakota. Northwest Science 67:238-245.
- Schlosser, Ami. 2013. Peter Norbeck Scenic Byway Lakes Enhancement Project in the Hell Canyon Ranger District, Black Hills National Forest, Custer and Pennington Counties, South Dakota. Project #R2013020300138.
- Schultz, Luke D. 2011. Environmental factors associated with long-term trends of mountain sucker populations in the Black Hills, and an assessment of their thermal tolerance. Master of Science Thesis, Major in Wildlife and Fisheries Sciences, South Dakota State University. Online: <http://pubstorage.sdstate.edu/wfs/thesis/Schultz%20Luke%20D%202011%20MS.pdf>.

- Smith, B.E. and N.T. Stephans. 2003. A conservation assessment for the redbelly snake in the Black Hills National Forest, South Dakota and Wyoming. U.S. Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota. 18 pp.
- Smith, B.E. and D.A. Keinath. 2007. Northern leopard frog (*Rana pipiens*): A technical conservation assessment. United States Department of Agriculture-Forest Service, Rocky Mountain Region. Online: <http://www.fs.fed.us/r2/projects/scp/assessments/northernleopardfrog.pdf>.
- South Dakota Codified Laws (SDCL). 41-13-3. Commission authority required to introduce fish or eggs into public waters. South Dakota Legislature, South Dakota Codified Laws. Online: <http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=41-13-3>.
- South Dakota Department of Environment and Natural Resources (SD DENR). 1988. Black Hills lakes preliminary study. Prepared for the United States Department of Agriculture-Forest Service by the South Dakota Department of Water and Natural Resources. August 1988.
- South Dakota Department of Environment and Natural Resources (SD DENR). 2010. Total maximum daily load calculation of pH for reservoirs in the Black Hills Plateau Ecoregion of Custer and Pennington Counties, South Dakota. November 2010. Online: [http://denr.sd.gov/dfta/wp/tmdl/tmdl\\_centerhorselegion0311.pdf](http://denr.sd.gov/dfta/wp/tmdl/tmdl_centerhorselegion0311.pdf).
- South Dakota Department of Environment and Natural Resources (SD DENR). 2012. The 2012 South Dakota integrated report for surface water quality assessment. South Dakota Water Quality, Water Years 2006-2011 (streams) and Water Years 2001-2011 (lakes). Prepared by South Dakota Department of Environment and Natural Resources. Online: <http://denr.sd.gov/documents/12irfinal.pdf>.
- South Dakota Game, Fish and Parks (SDGFP). 1999. South Dakota Wildlife Diversity Small Grants Results and Reports: 1997-98. Finescale dace and lake chub survey by Ricky D. Olson. GFP Report 99-12.
- South Dakota Game, Fish and Parks (SDGFP). 2006a. Statewide Fisheries Surveys, 2004. Surveys of public waters. Part I Lakes; Region 1. Annual Report No. 06-09.
- South Dakota Game, Fish and Parks (SDGFP). 2006b. Non-resident fishing in South Dakota-2006: annual, family, three-day, & one-day licenses-special focus on the Black Hills. Report HD-8-07.AMS. Pierre, South Dakota.
- South Dakota Game, Fish and Parks (SDGFP). 2007. Angler use and harvest surveys on Lakota Lake, South Dakota, 1997-1998. South Dakota Fisheries. Completion Report No. 07-13.
- South Dakota Game, Fish and Parks (SDGFP). 2008. Angler use and harvest surveys on Coldbrook Reservoir, Sylvan Lake, Center Lake, Horsethief Lake, Canyon Lake, and Iron Creek Lake, South Dakota, May-August 2007. Completion Report No. 08-02. Online: [http://gfp.sd.gov/fishing-boating/tacklebox/lake-surveys/western-lakes/docs/Creel\\_BHlakes-07.pdf](http://gfp.sd.gov/fishing-boating/tacklebox/lake-surveys/western-lakes/docs/Creel_BHlakes-07.pdf).
- South Dakota Game, Fish and Parks (SDGFP). 2009. Stream fisheries database. May 11, 2009. Pierre, South Dakota.
- South Dakota Game, Fish and Parks (SDGFP). 2010. Statewide fisheries surveys, 2009. Surveys of public waters. Part 1-Streams Region 1. Annual Report No. 10-09. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota. Online: <http://gfp.sd.gov/fishing-boating/tacklebox/lake-surveys/western-lakes/docs/Stream-Surveys-2009.pdf>.

- Stefanich, M.R. 2001. Draft conservation assessment for the tawny crescent in the Black Hills National Forest of South Dakota and Wyoming. Black Hills National Forest. March 2001.
- Stewart, R.K. and C.A. Thilenius. 1964. Stream and lake inventory and classification in the Black Hills of South Dakota. Dingell-Johnson Project F-1-R-13, Job Numbers 14 and 15. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.
- Sundstrom, Linea. 1989. Culture history of the Black Hills with reference to adjacent areas of the Northern Great Plains. J&L Reprint Company, Lincoln, NE.
- Tallman, D.A., D.L. Swanson, and J.S. Palmer. 2002. Birds of South Dakota. Third edition. Midstates/Quality Quick Print, Aberdeen, South Dakota. 441 pp.
- USDA Forest Service. 1995. Agricultural Handbook 701. Landscape aesthetics: a handbook for scenery management, and (2000) landscape aesthetics handbook revision. Washington, DC: US Government Printing Office. Online: <http://www.esf.edu/es/via/>.
- USDA Forest Service. 2000. Expert interview summary for the Black Hills National Forest Land and Resource Management Plan Amendment. Unpublished Report. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota. Online: [http://fsweb.blackhills.r2.fs.fed.us/int\\_dir/00\\_10\\_25\\_ExpertInterviewSum.pdf](http://fsweb.blackhills.r2.fs.fed.us/int_dir/00_10_25_ExpertInterviewSum.pdf).
- USDA Forest Service. 2004. National Visitor Use Monitoring Results. United States Department of Agriculture-Forest Service, Region 2, Black Hills National Forest. Prepared by: USDA-Forest Service, Southern Research Station. June 2004. Online: [http://www.fs.fed.us/recreation/programs/nvum/reports/year4/R2\\_F3\\_blackhills\\_final.htm](http://www.fs.fed.us/recreation/programs/nvum/reports/year4/R2_F3_blackhills_final.htm).
- USDA Forest Service. 2005. Final environmental impact statement, phase II amendment. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota. Online: [http://www.fs.fed.us/r2/blackhills/projects/planning/amendments/phase\\_II/index.shtml](http://www.fs.fed.us/r2/blackhills/projects/planning/amendments/phase_II/index.shtml).
- USDA Forest Service. 2006. Black Hills National Forest, phase II amendment. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota. Online: [http://www.fs.fed.us/r2/blackhills/projects/planning/amendments/phase\\_II/index.shtml](http://www.fs.fed.us/r2/blackhills/projects/planning/amendments/phase_II/index.shtml).
- USDA Forest Service. 2008. FY2007 monitoring and evaluation report. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota.
- USDA Forest Service. 2010. FY2009 monitoring and evaluation report. United States Department of Agriculture-Forest Service, Black Hills National Forest. Custer, South Dakota. Online: [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5262950.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5262950.pdf).
- USDA Forest Service. 2011. Forest Service Manual, Black Hills National Forest. FSM 2600 – wildlife, fish and sensitive plant habitat management. Chapter 20-habitat planning and evaluation. Supplement Number: r2\_bh\_2600-2011-1.
- US Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. Online: <http://www.fws.gov/migratorybirds/>.
- US Fish and Wildlife Service (USFWS). 2012. Federal endangered and threatened species list by county for South Dakota. United States Fish and Wildlife Service, South Dakota

Ecological Services Field Office Home Page. Online:  
<http://www.fws.gov/southdakotafieldoffice/SpeciesByCounty.pdf>.

U.S. Fish and Wildlife Service (USFWS). 2013. Endangered species by county list. South Dakota Ecological Services Field Office, Pierre, SD. Updated 4 October 2012. Accessed March 7, 2013. Online: <http://www.fws.gov/southdakotafieldoffice/SpeciesByCounty.pdf>.

Vermont Fish and Wildlife Department. 2004. Vermont fish health fact sheet – yellow grub. Yellow grub fact sheet. Vermont Agency of Natural Resources FW-04/04. Online: [http://www.vtfishandwildlife.com/library/Factsheets/Fisheries/Fish\\_health/Yellow\\_grub.pdf](http://www.vtfishandwildlife.com/library/Factsheets/Fisheries/Fish_health/Yellow_grub.pdf).

Vierling, K. 2005. Report on woodpecker breeding in the Jasper Fire. South Dakota School of Mines and Technology/University of Idaho, submitted to the South Dakota Game, Fish and Parks Department, May 18, 2005.

Wiggins, D. 2006. Mountain bluebird (*Sialia currucoides*): A technical conservation assessment. United States Department of Agriculture-Forest Service, Rocky Mountain Region. Online: <http://www.fs.fed.us/r2/projects/scp/assessments/mountainbluebird.pdf>.

**Appendix A:**  
**Maps & Photographs**

**Map 1:** Byway Lakes Enhancement Project Vicinity Map

**Map 2:** Alternative 2- Modified Proposed Action – Horsethief Lake

**Map 3:** Alternative 2- Modified Proposed Action – Bismarck Lake

**Map 4:** Alternative 2- Modified Proposed Action – Lakota Lake

**Map 5:** Horsethief Lake Watershed Map

**Map 6:** Bismarck Lake Watershed Map

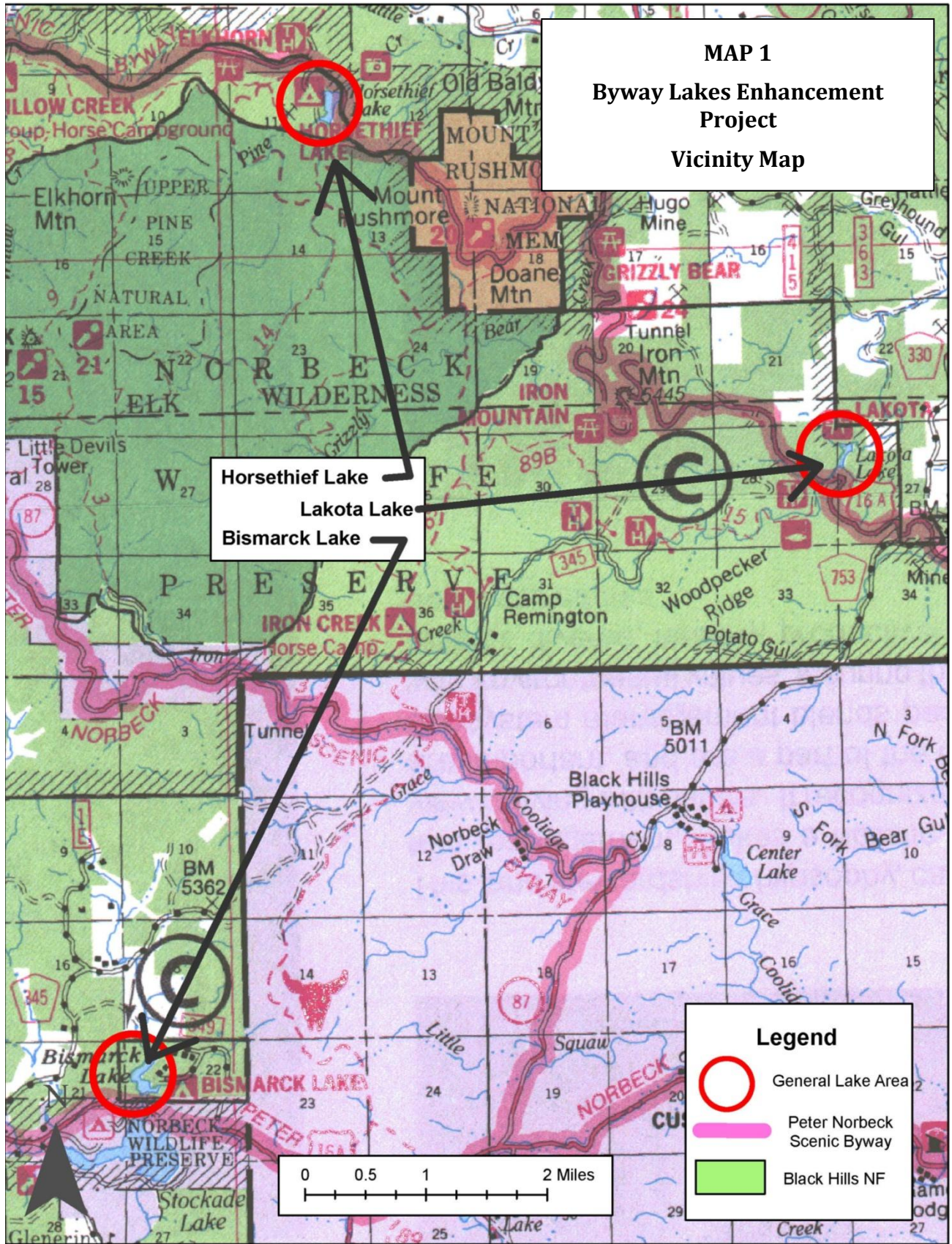
**Map 7:** Lakota Lake Watershed Map

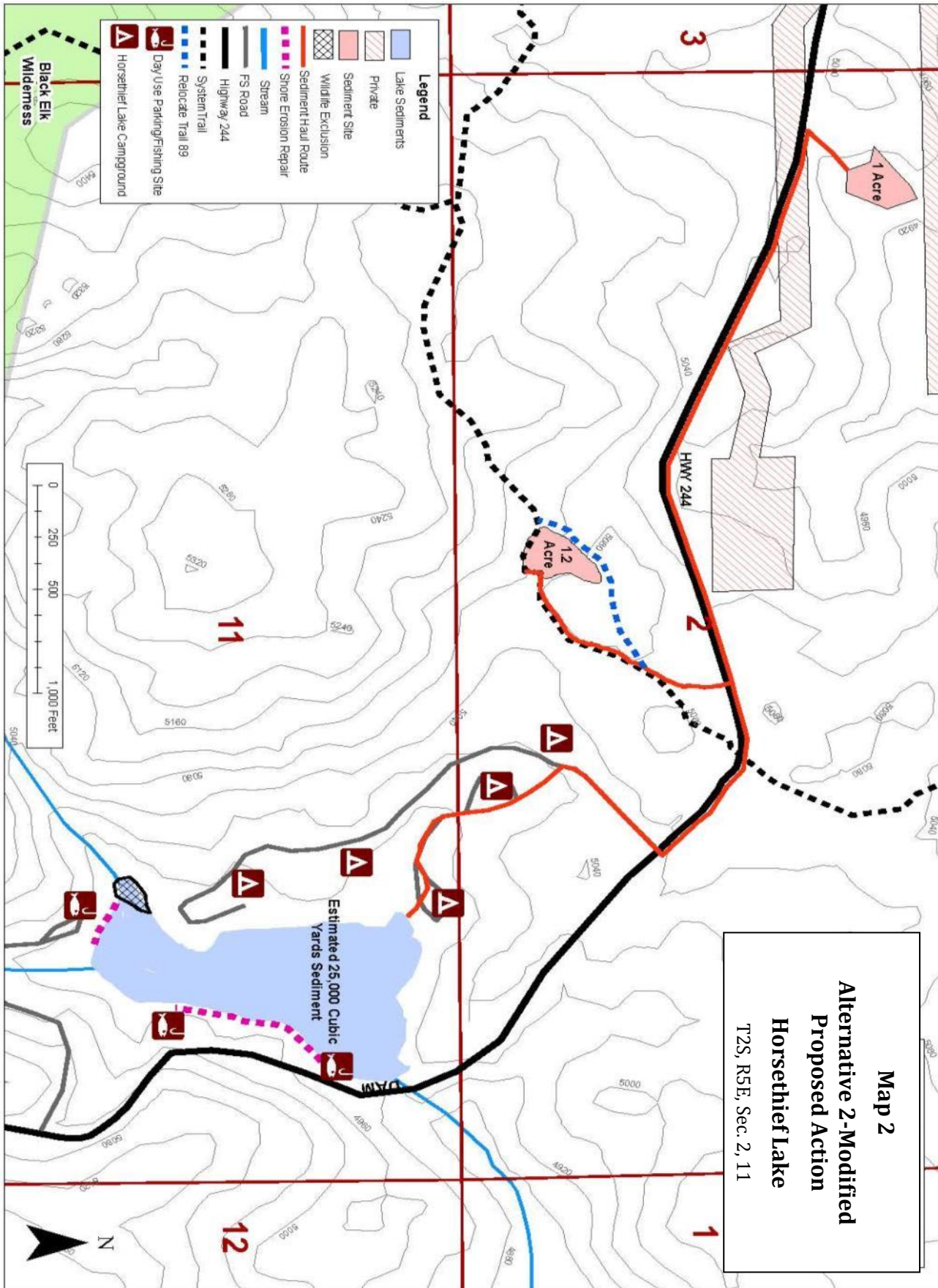
**Photo Spread 1:** Horsethief Lake Outlet Photos

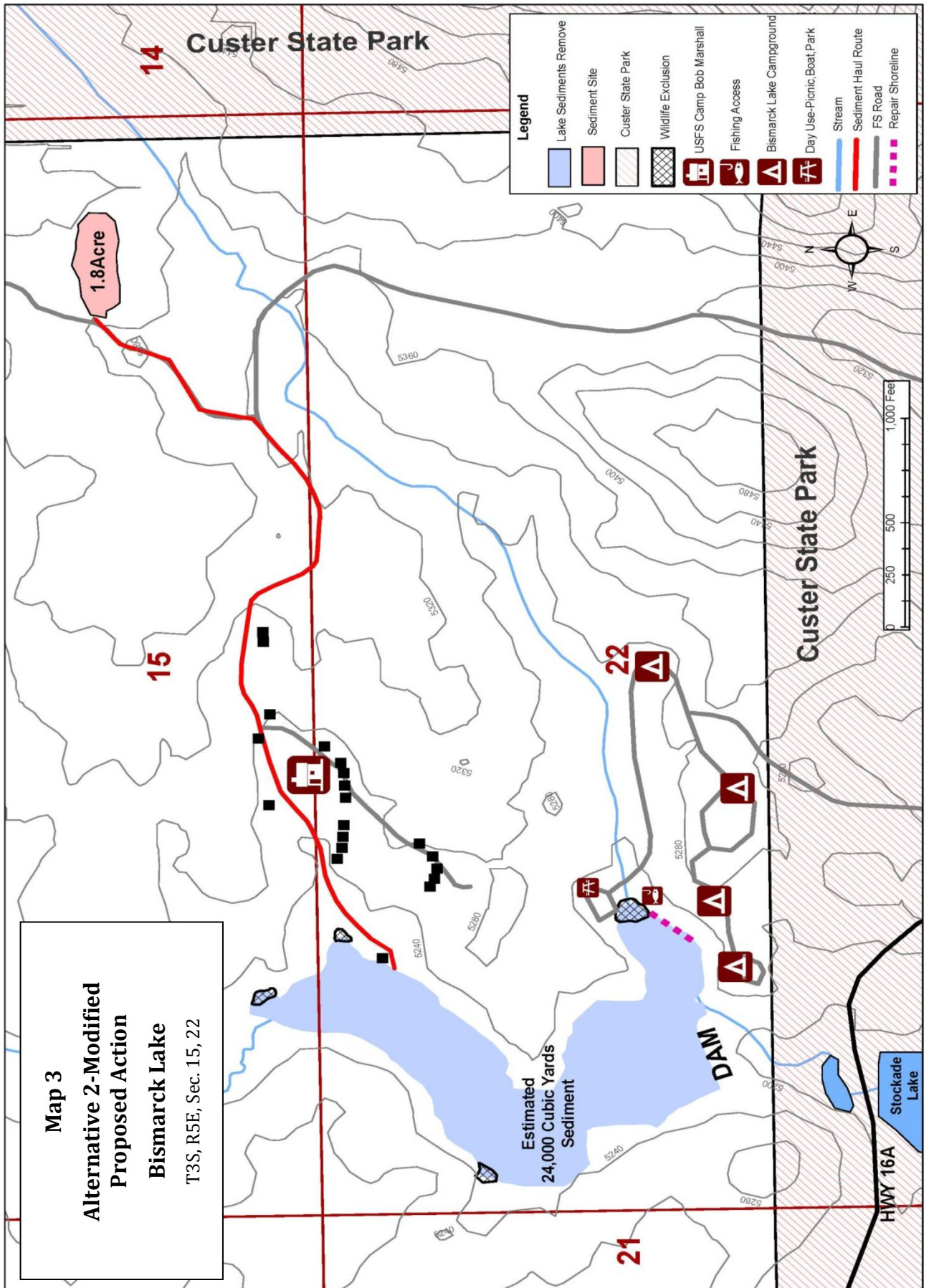
**Photo Spread 2:** Bismarck Lake Outlet Photos

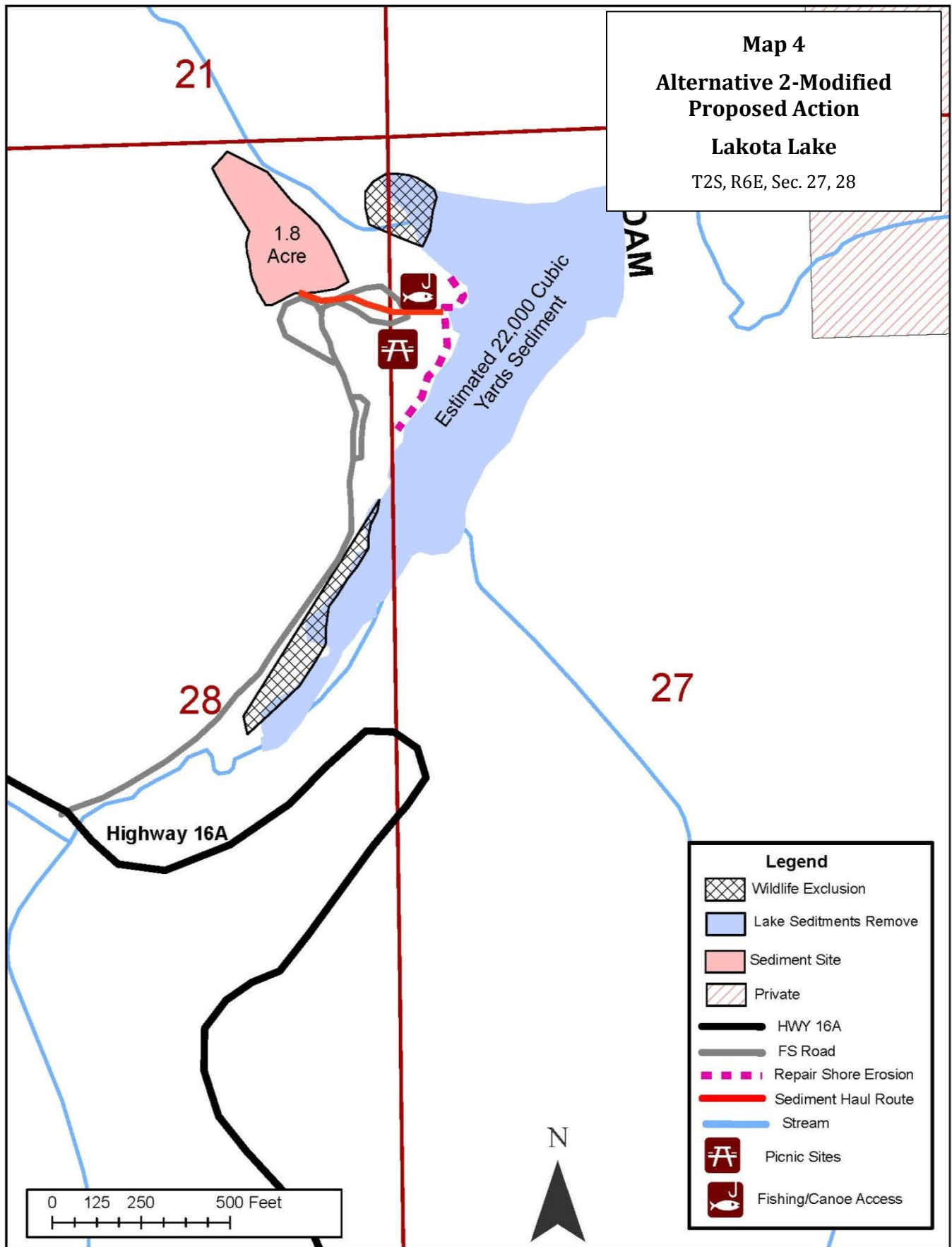
**Photo Spread 3:** Lakota Lake Outlet Photos

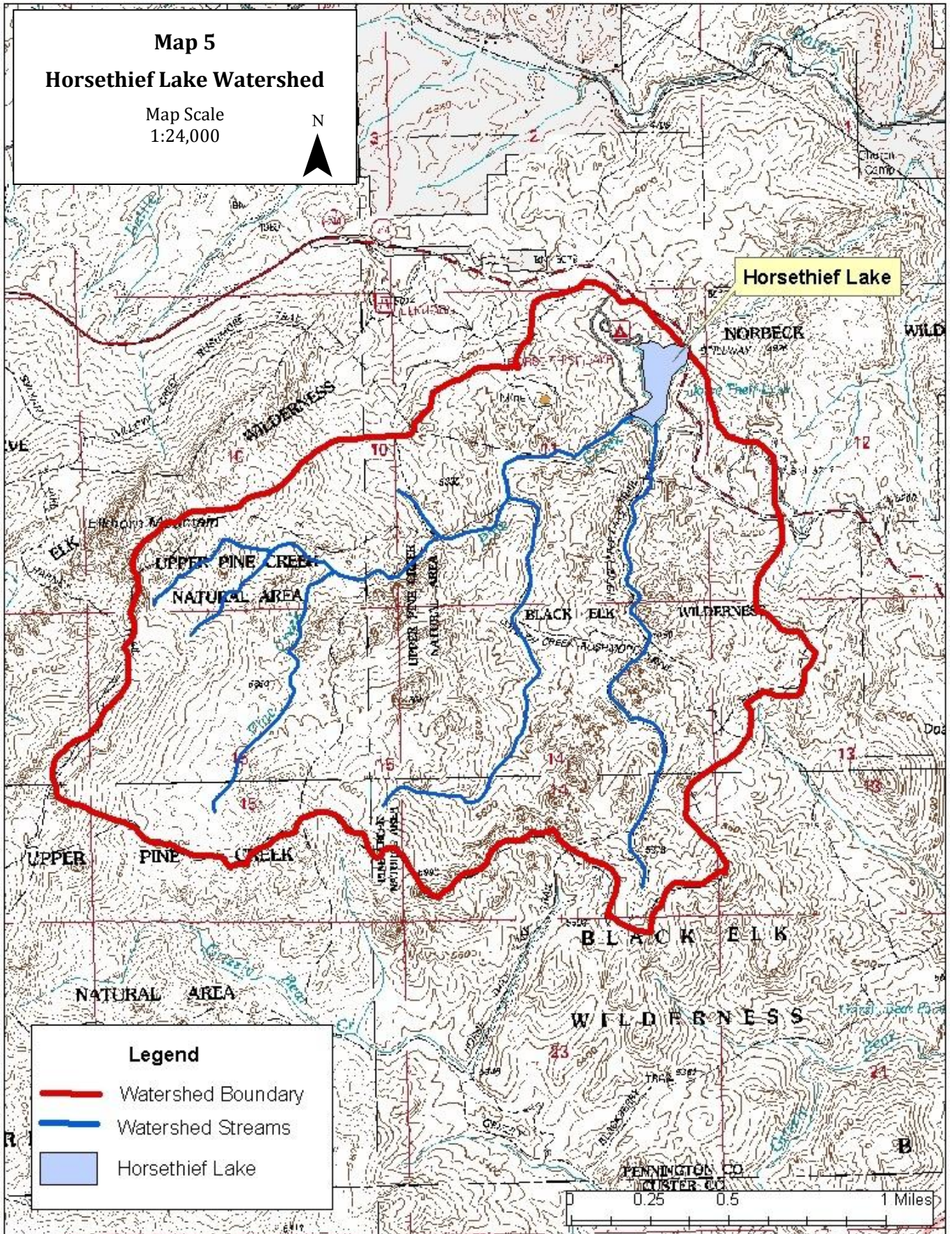


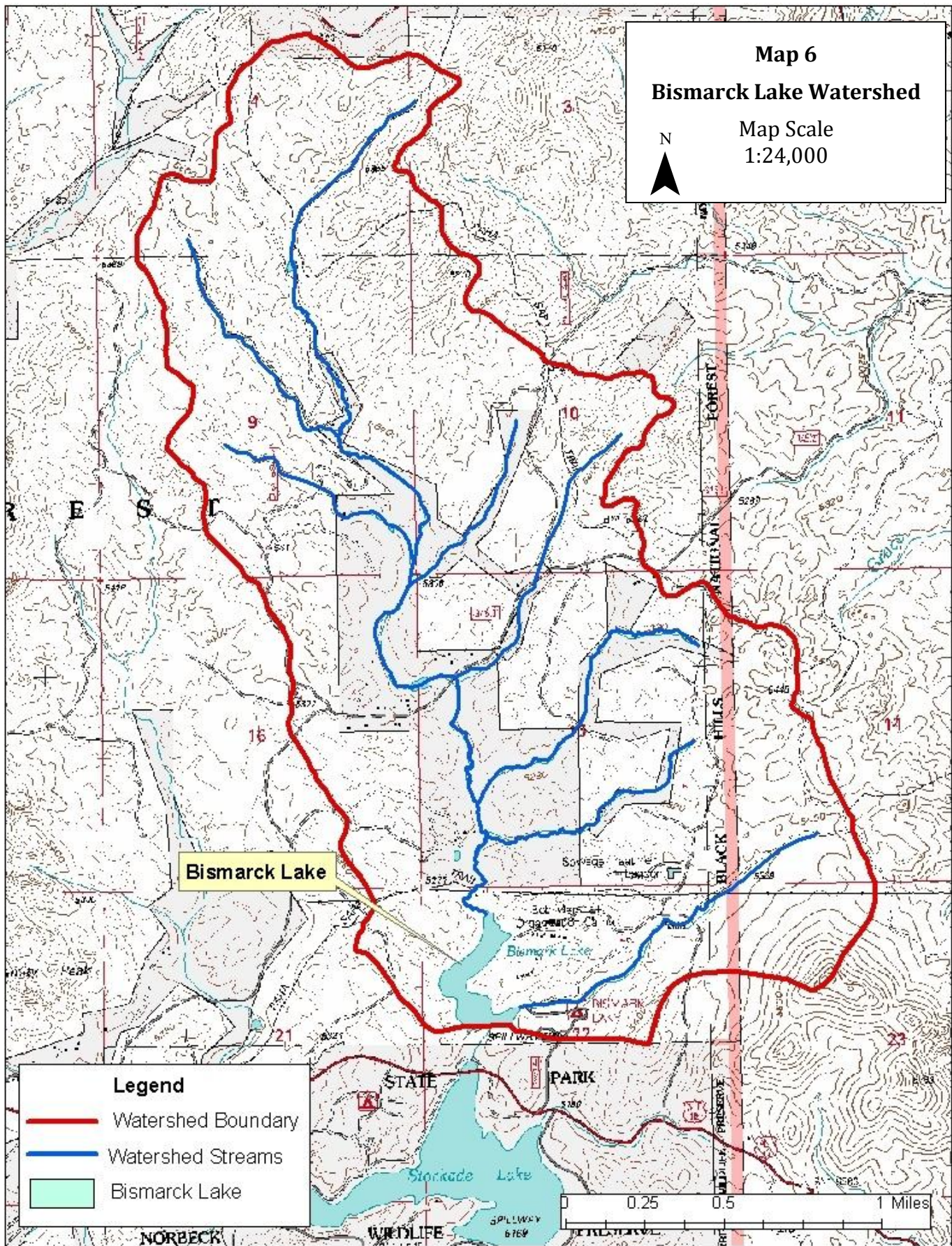


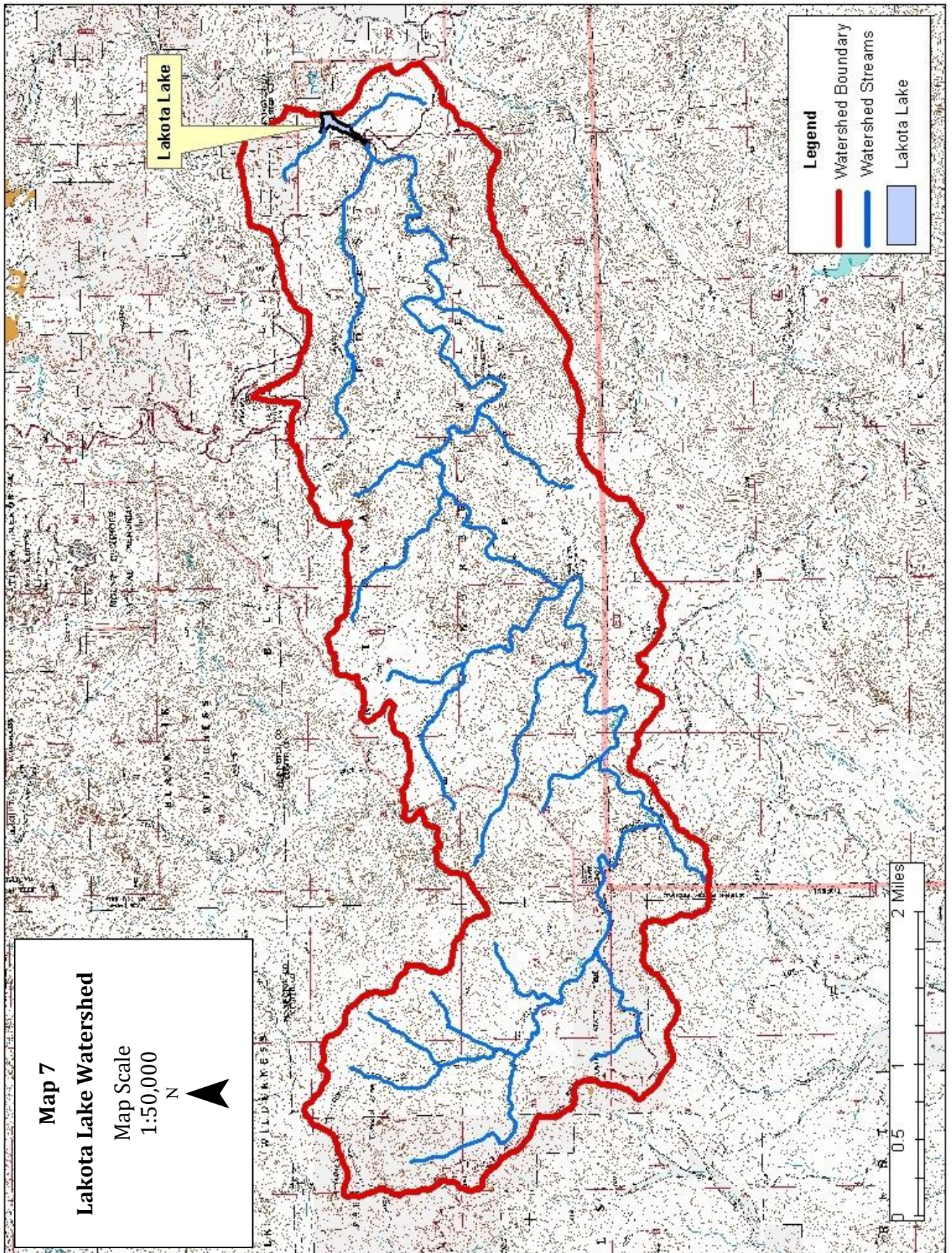












# Photo Spread 1

## Horsethief Lake Outlet Photos

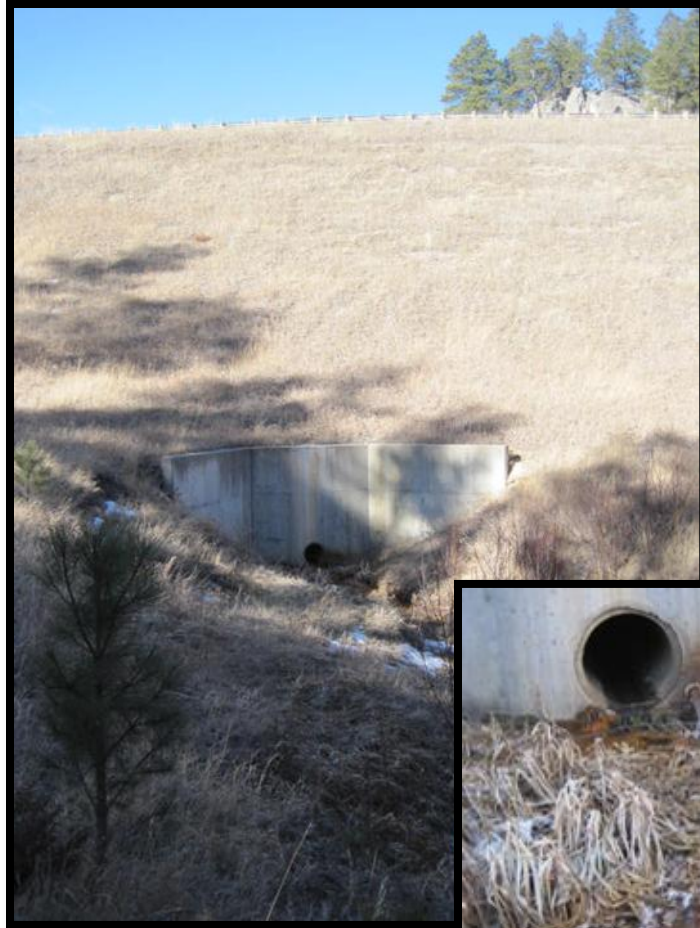


Horsethief Lake outlet looking upstream with no outflow.

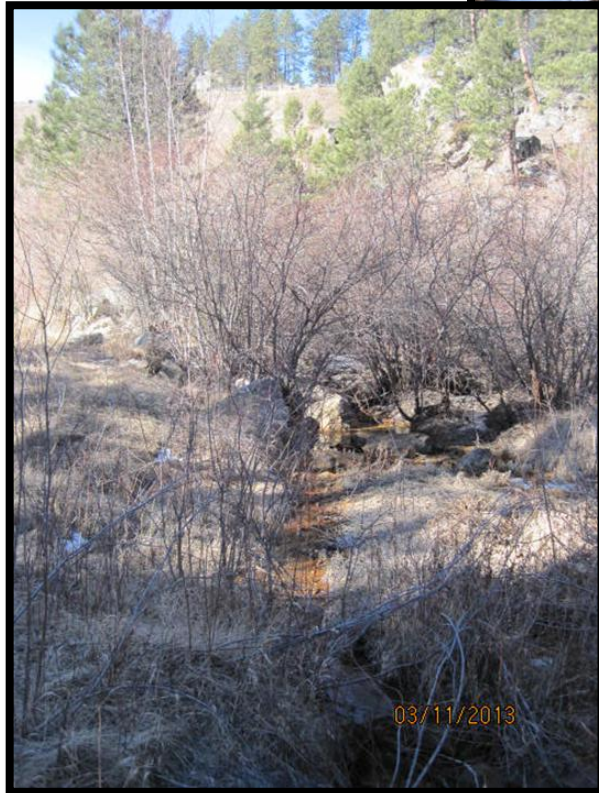


Horsethief Lake outlet looking downstream; inset photo of dry outlet culvert.





Out flow from discharge pipe.



Pine Creek accretion flows less than 100 yards downstream of spillway outlet.

## Photo Spread 2

Bismarck Lake Outlet Photos



Bismarck Lake outlet looking upstream with no outflow.



Bismarck Lake spillway with no outflow.



Outflow from discharge pipe.



Settling basin below Bismarck Lake.

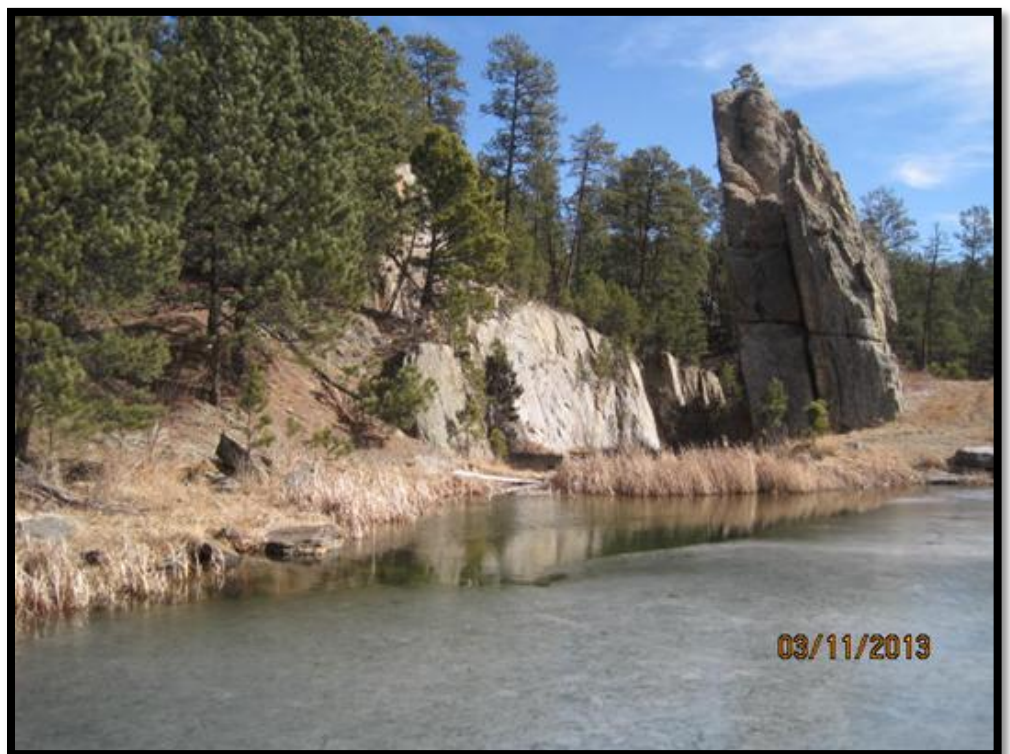
### Photo Spread 3

Lakota Lake Outlet Photos



Lakota Lake outlet looking upstream with outflow.

Lakota Lake outlet from the lake side.





Lakota Lake outlet/spillway looking downstream.



# **Appendix B:**

# **Design Criteria**





## APPENDIX B: Design Criteria

The following design criteria are listed by resource area and do not suggest any particular order of priority. All activities proposed in this project, including post-sale activities and monitoring, require use of these design criteria, where applicable.

Forest Service Manual and Handbook direction, Regional Watershed Conservation Practices (WCP's), Forest Plan standards and guidelines, South Dakota Best Management Practices (BMP's) and other management requirements apply to the proposed activities. Some management requirements, such as Forest Plan standards, are repeated here for emphasis.

### Botany

- Follow all Forest Plan Objectives, Standards, and Guidelines relating to rangeland resources, flora species, weed control, and re-vegetation.
- Monitoring and surveying for R2 Sensitive Plant Species, Species of Local Concern (SOLC), and state listed plant species would be ongoing. Management of any new occurrences of SOLC would be considered if action alternative is chosen.
- Noxious weed infestations would be treated with herbicides and/or biological controls after treatments to reduce infestations and allow native vegetation to compete with non-natives. Areas would be retreated as necessary.
- Where ground-disturbing activities occur in areas infested with weeds, weeds would be treated prior to project implementation, where feasible, to reduce future spread and establishment of noxious weeds.
- Contracts and permits issued as part of this project would include measures to limit spread of noxious weeds. Where proposed activities would occur in areas infested with noxious weeds and considered to be at high risk for spread, off-road equipment associated with the activity will be cleaned before leaving the infestation to prevent spread of weeds to adjacent NFS and private lands. Known areas meeting these criteria will be identified by District staff before commencement of any contract associated with this project. Known weed infestations will be displayed on the project map.
- Review of the area for noxious weed infestations would continue during management activities. If new noxious weed infestations that could be spread by management activities are found during implementation, actions to minimize spread would be taken.
- Disturbed soil (above the waterline) and soil disposal sites would be re-vegetated in a manner that optimizes plant establishment for that specific site. Re-vegetation may include topsoil replacement, planting, seeding, fertilization, liming, and placement of weed-free mulch as necessary. Re-vegetation would be initiated as soon as possible, generally not to exceed 6 months, after termination of ground-disturbing activities. All disturbed soils would be re-vegetated with native species, using seed mixtures free of noxious weeds. On areas needing the immediate establishment of vegetation, non-native, non-aggressive annual, non-aggressive perennials, or sterile perennials, may be used until native perennials become established. These species can be used to prevent the spread of noxious weeds and prevent erosion. Only weed-free mulch would be used.
- Disturbed areas such as trails and temporary roads would be seeded with certified weed-free seed as needed.
- Avoid disturbances to grassland and meadows with activities such as temporary road construction.

## Wildlife

- Enhance shrub productivity. **Objective 5.4A-204**
- Maintain or enhance existing riparian area biodiversity, physical structure and size. **Objective 213**
- Conserve or enhance habitat for R2 sensitive species and species of local concern (SOLC). Monitoring would be conducted at a Forest-wide level, not at the project level, and would be done for habitats or populations. **Objective 221**
- The following are objectives for management indicator species (MIS). MIS would be monitored using trends in habitat; however, when available, population trends may be used as a strong indicator of management response. Monitoring would be conducted at a Forest-wide scale and not at the project level. Population monitoring would be discretionary as provided by 219.14.f.
  - a. Maintain or enhance habitat for ruffed grouse, beaver, song sparrow, grasshopper sparrow, white-tailed deer and brown creeper; as outlined in specific direction pertaining to aspen, other hardwoods, riparian areas, grasslands, spruce and ponderosa pine (e.g., Objectives 201, 205, 211, 239-LVD, 5.1-204).
  - b. Maintain habitat opportunities for black-backed woodpeckers across the Forest, as outlined in specific direction pertaining to conifer habitat, snags and recently burned habitat (e.g., Objectives 211, 11-03, 5.1-204, Standard 2301)
  - c. Maintain habitat for golden-crowned kinglets, as outlined in specific direction pertaining to spruce habitat (e.g., Objective 239-LVD).
  - d. Maintain or enhance habitat quality and connectivity for mountain suckers, as outlined in specific direction pertaining to aquatic resources (e.g., Objectives 103, 104, 215, Standards 1201, 1203, 1205, Guideline 1115). **Objective 238**
- Riparian areas or wetlands where populations of sensitive species are located are to be avoided during ground disturbing activities. Use one or more of the following (or other mitigation measures) tied to the site-specific conditions for disturbances adjacent to known occurrences:
  - a. Avoid removing riparian or wetland vegetation; filling or dredging the riparian area or wetland; diverting stream flow from the current channel.
  - b. Prevent storm runoff from washing silt into the stream or wetland.
  - c. Reseed and/or replant cut and fill slopes with native seed and/or native plants promptly to control erosion and for the prevention of noxious-weed infestations. Use appropriate measures to control erosion on disturbed areas that are steep, are highly erosive, and/or adjacent to the riparian area.
  - d. Timing, placement, and installation of temporary stream diversions shall allow passage of aquatic life and protect sensitive and species of local concern.

### Standard 3106

- Northern leopard frogs (R2 Sensitive Species) have been found at Horsethief and Lakota Lakes, and it is expected that they occur at Bismarck Lake. Areas (mostly where there are cattails) of avoidance to protect these species during dredging activities have been mapped. Additional areas to avoid include an area close to an osprey nest.
- Any R2 sensitive species or species of local concern located after contract or permit issuance will be appropriately managed by active coordination between permittee, contractor or purchaser, Forest Service line officer, project administrator, and biologist/botanist. Solutions would be based on the circumstances of each new discovery

and must consider the species need, contractual obligations and costs, and mitigation measures available at the time of discovery. **Standard 3115**

- Avoid creating barriers (e.g., new open roads) between red-bellied snake hibernacula and wetlands. **Standard 3116**
- Provide riparian habitat by maintaining or establishing riparian shrub and tree species, and protect riparian habitat from animal damage if needed. **Guideline 3210**
- Provide riparian habitat diversity through vegetation treatments or in conjunction with other resource activities designed to maintain or improve wildlife or fisheries habitat and stream stability. **Guideline 3211**
- Manage for high quality riparian communities.
  - a. Provide stable stream banks.
  - b. Retain woody vegetation along streams and lakes to provide shading for aquatic life and habitat for terrestrial species.
  - c. Provide large woody material for aquatic life.

#### **Guideline 3212**

- Location of roads would use existing/old road beds. Obliterate any temp roads.
- Use fencing to protect any hardwood or willow species that may be planted to protect from browsing ungulates.

## **Scenery**

At lakeshore entrance/exit sites:

- Rehabilitate the locations along the lake shore where heavy equipment enter/exit the sediment removal areas and the sediment disposal sites.
- Re-contour lake shore so it matches adjacent areas.
- Re-seed with similar plants to what is already there. Choose grasses that would withstand heavy recreation use, if possible. Avoid tall grasses, as these are recreation areas adjacent to campground and day use areas. Over-seed grasses to ensure dense establishment of grasses in these areas.
- Clean up any spilled sediment on the roads within the recreation site(s).

At sediment deposit sites:

- Contour sediment to match the adjacent areas.
- Re-seed with grasses to quickly stabilize the sediment in the first growing season.

## **Fisheries**

- In order to prevent the introduction or spread of aquatic nuisance species (ANS) and the yellow grub (*Clinostomum complanatum*; found in Bismarck and Lakota Lakes), all equipment and other materials, i.e. bypass pipe, etc., that may come in contact with stream/lake water or dredge spoils should be inspected, cleaned, drained, disinfected, or completely dried prior to and after construction if the equipment was previously used in another stream, river, lake, pond or wetland. Horsethief Lake should be the first lake drained and dredged if the same contractor/equipment is also going to be used on Bismarck and/or Lakota Lakes.

- The following are recommended methods for preventing the spread of aquatic nuisance species:
  - a. Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, bypass pipe, etc.) and keep the equipment dry for 10 days prior to and after use; or
  - b. Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, bypass pipe, etc.) and spray/soak equipment with water greater than 140 degrees F for at least 10 minutes; or
  - c. Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, bypass pipe, etc.) and spray/soak equipment with either a 1:1 solution of Formula 409 Household Cleaner and water, or a quaternary ammonia compound (QAC) solution (see table below). Treated equipment must be kept moist for at least 10 minutes.

Commercially available QAC disinfectants, percent (%) active QAC, percent QAC concentration in solution, and amount of disinfectant recommended (ml and ounces) per gallon of water to obtain a full kill of invasive aquatic organisms. **NOTE:** 6 ounces disinfectant per gallon equates to a ratio of QAC to water of 1:21.

Disinfectant Name	% Active QAC (MSDS)	% QAC Conc. In Solution	ml per gal	Ounces per gal
Quat 4	10.0	0.47	177.5	6.0
Super HDQ Neutral	16.9	0.79	177.5	6.0
Green Solutions (GS) High Dilution Disinfectant 256	21.7	1.0	177.5	6.0
Vedco 128	8.45	0.40	177.5	6.0
Quat 128	8.45	0.40	177.5	6.0

## Recreation

- Return any disturbed system trails to a trail Class III condition.
- Temporarily sign, post newspaper/internet/bulletin board notices for areas of disturbance before and during project implementation for the recreation public. This should include recreation foot, vehicle and/or horse traffic areas including parking lots, trails, foot bridges, closed recreation sites, etc. during project implementation.
- Protect recreation facilities such as buildings, parking lots, roads, toilets, picnic tables, fire grills etc. in the contract package. Flag/mark small items above expected snow levels with fluorescent tape for protection from heavy equipment.
- For travel management purposes, re-establish vegetation on disturbed areas near roads and developed recreation sites as soon as possible to discourage illegal off-road motorized travel. Ensure travel management gate remains closed and signed for no motorized travel on road leading to Horsethief Lake gravel pit sediment site. Place temporary area closed signs or natural barriers such as large rocks or logs to block access and help prevent illegal off road travel until vegetation becomes re-established.
- Use native rock for shoreline erosion control. Strategically place larger flat rocks beside popular shoreline fishing areas to harden the soil surface and prevent future erosion problems.
- Protect Forest Service and State Highway roads used for this project.
- Protect and provide final maintenance on roads including culverts, gates, adding gravel, signs and ditches, etc. so they are ready for meeting public needs in the spring.

## Hydrology

### Lake Bed and Wetlands

- Obtain Clean Water Act Section 404 Permits and follow the conditions of the permit, for each reservoir, prior to commencing work/drawdown.
- Maintain a residual pool to settle out sediment.
- Put the creek in a pipe, from entry point of reservoir to residual pool, to minimize sediment movement.
- Where cattails are retained, remove the adjacent sediment in a vertical wall to discourage/limit expansion of cattails and accumulation of sediment.

### Lake Shore

- To protect the lake shore from erosion from wave action and foot traffic, maintain existing vegetation and rocks along the shore line.
- Do not excavate sediment any closer than 10 feet from the lake shore where the shoreline is not protected by rock (natural or placed) or vegetation, primarily cattails.

### Disposal Sites

- Obtain Storm Water Permits, for each disposal site, prior to work.
- Erosion Control methods will need to be in place for Lakota Lake disposal site, to keep material from moving off of site towards Lakota Lake. (Compost Socks, Straw Wattles, Silt Fence, are some examples.)
- Upon completion of final shaping of Lakota Lake disposal site, erosion control fabric would be placed for 20 feet from the bottom on the lake side to minimize/prevent erosion and establish vegetation quicker. (Excelsior Matting is an example.)

**Note:** Horsethief and Bismarck disposal sites do not need any erosion control measures to protect water quality. These disposal sites are 1,800 feet from Horsethief Lake for Horsethief 1.2 acre site, 3,500 feet from Battle Creek for Horsethief 1 acre site and 3,000 feet from Bismarck Lake for Bismarck 1.8 acres site. The distance or buffer would protect water quality consistent with Standard 1301. Erosion control fabric is not needed upon final shaping for water quality protection but may be desired to get vegetation established quicker because it would act as mulch.

### Temporary Road

- Where the roads are not needed, obliterate (recontour) and seed haul routes to sediment deposit sites.

## Transportation

- During hauling of sediment all existing roads shall be protected. Possible methods of protection include: placing aggregate over asphalt roads in campgrounds, placing additional aggregate on aggregate surfaced roads, and cleaning sediment from existing roads deposited during hauling.
- Roads into disposal pits shall be maintained to original condition.
- Clear existing trees from proposed sediment disposal sites and chip/pile for later use as mulch to help reclaim sediments.
- Sediment disposal sites shall be treated when conditions and timing restrictions permit by pushing sediment into a smooth uniform pile in the shape approved by the Engineer. Fill slopes of the final pile shall be approximately three or four horizontal to one vertical.

Height of pile would vary depending on quantity hauled to each sediment disposal site. Entire area would be seeded and erosion control measures taken as needed.

- Control discharge of turbid water from the work area and completed excavations to maintain downstream water quality. Provide filtering as required.

## **Heritage**

- The implementation of project activities may cause the inadvertent discovery of cultural resources. If during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area are uncovered, all operations will cease within a 100-meter radius of the site location and a District Archaeologist notified immediately. The SHPO and regional THPOs will be notified of the discovery and provided an opportunity to comment. Any cultural resources located during project implementation will be protected based on the recommendations of the District Archaeologist and the South Dakota SHPO.

# **Appendix C:**

## **Project Monitoring**





## **APPENDIX C: Project Monitoring**

The Forest Plan identified specific items to be monitored, and the Monitoring Implementation Guide (USDA Forest Service 2005) describes monitoring protocols that have been established for numerous resources, as directed by the Forest Plan. The Monitoring Implementation Guide identified frequency and methods of data collection, unit of measure, sampling design, expected precision and reliability, reporting frequency, data storage location, and costs for each monitoring item identified by the Forest Plan. This guide is subject to periodic adjustments. For additional information, refer to the Forest Plan (Chapter 4), and the Monitoring Implementation Guide.

The ID Team compiled additional monitoring objectives/items summarized below to provide emphasis and specifics regarding particular resource monitoring needs in the project area. All monitoring objectives/items will be prioritized by the responsible line officer if funding is not available to implement all objectives/items listed or referenced in the Monitoring Plan.

### **Heritage**

There are no eligible sites located within the project area. Therefore there is no monitoring plan needed for this project. In the event of inadvertent discovery of cultural resources, the resources will be recorded, evaluated and monitored post-implementation if determined eligible for listing on the National Register of Historic Places in consultation with the South Dakota SHPO.

### **Wildlife**

Monitoring of protection measures would occur by District Wildlife Biologists during project implementation.

### **Botany**

Disturbed areas would be monitored for noxious weeds. The effectiveness of the treatment measured. Areas should be re-treated as necessary.

### **Hydrology and Fisheries**

On-going South Dakota DENR monitoring through an established ambient water quality monitoring program

Monitoring of protection measures will occur by Forest Fisheries Biologist during project implementation.

Monitoring of protection measures will occur by South Zone Hydrologist during project implementation.

### **Recreation**

Monitoring of protection measures and condition of recreation facilities will occur by District personnel during project implementation.

### **Scenery**

Monitoring of protection measures will occur by Forest Landscape Architect during project implementation.



**Appendix D:**  
**Summary**  
**Biological Assessment**  
**&**  
**Biological Evaluation**



# APPENDIX D: Summary Biological Assessment & Biological Evaluation

## Introduction

This is a summary of the Byway Lakes Enhancement Project Biological Assessment/Biological Evaluations (BA/BEs), and is a review and analysis of actions proposed in the Byway Lakes Enhancement Project Environmental Assessment (EA). The complete BA/BE's are in the Byway Lakes Enhancement Project file located at the Hell Canyon Ranger District office at 330 Mt. Rushmore Rd., Custer, SD. The purpose of a BA/BE is to determine how the proposed action and alternatives to the proposed action would affect federally listed species or sensitive species listed by the Rocky Mountain Region (FSM 2670, R2 Supplement No. 2600-2011-1, 2672.11 – Exhibit 01 effective June 10, 2011).

The Byway Lakes Enhancement Project BA/BE's are prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act of 1973 (19 U.S.C. 1536 (c)), and follow standards established in Forest Service Manual direction (2672.42) and the Code of Federal Regulations (50 CFR S402).

The Byway Lakes Enhancement Project BA/BEs tier directly to the EIS for the revised Black Hills National Forest Land and Resource Management Plan (Forest Plan) as amended, the BA/BE completed for the Forest Plan revision, and the BA/BE prepared for the Phase II Amendment (USDA Forest Service 2006).

## Pre-Field Review and Reconnaissance

### *Botany*

#### Federally Listed Plant Species

The U.S. Fish and Wildlife Service (USFWS) website list for Threatened and Endangered species was accessed on September 14, 2012 for the state of South Dakota. There are **no threatened or endangered plant species habitat known to occur in the State of South Dakota, nor does habitat that could support threatened or endangered plant species known from adjacent states occur in the project area** (USFWS 2012).

#### Region 2 (R2) Sensitive Plant Species

The Region 2 Forest Service sensitive species listed was updated by the Regional Forester on June 10, 2011 (USDA Forest Service 2011). All R2 sensitive plant species potentially occurring in the Black Hills National Forest were considered in the evaluation. Based on the pre-field review, **no R2 sensitive plant species or suitable habitat has been located within the project area**. Potential habitat exists adjacent to the projected disturbance areas but no potential habitat exists within these areas. Two species (*Cypripedium parviflorum*, *Viola selkirkii*) were initially considered for analysis, but were subsequently dropped from analysis due to lack of potential habitat. Sources of information included botanical surveys, Forest Service records and files, local professional judgment, and published research.

### *Wildlife*

#### Federally Listed Animal Species

A list of federally threatened, endangered and proposed species has been provided by the U.S. Fish and Wildlife Service (USFWS), South Dakota State Office, and was last updated on October 4, 2012 (USFWS 2012). The USFWS lists the following endangered and/or threatened species

for Custer County, South Dakota: whooping crane and black-footed ferret. The following is listed for Pennington County, South Dakota: whooping crane, least tern, and black-footed ferret.

The whooping crane and least tern have been removed from the list of species considered on the Black Hills National Forest under Section 7 consultation (letter of concurrence from D. Gober, Field Supervisor, USFWS, Pierre, South Dakota, dated August 8, 2003). Although the black-footed ferret is listed for Custer County, it is listed as endangered, where they have been re-introduced within Wind Cave National Park, under a certain permit that includes provisions for take. Additionally, the black-footed ferret is listed for Pennington County, and it is an experimental population located in eastern Pennington County, where they have been re-introduced into Badlands National Park and the Conata Basin of Buffalo Gap National Grassland. Habitat for the black-footed ferret is not present in the project area. There are no prairie dog colonies present. It was determined that management activities on the Forest would have ‘*no effect*’ on these species because the Black Hills National Forest lacks suitable habitat.

The USFWS lists the Sprague’s pipit as a possible migrant through Custer and Pennington Counties. This species uses large areas of grassland habitat throughout the year. This type of habitat is not present in the project area, but they may migrate through the project area. This species has not been observed in the project area. The project and associated activities would not reduce habitat for this species and, therefore, would have ‘*no effect*’ on Sprague’s pipit.

**Table D - 1. Expected Occurrence of Threatened and Endangered Species within the Project Area**

Species	Status <sup>1</sup>	Species Present <sup>2</sup>	Habitat Present <sup>3</sup>	Further Analysis Provided <sup>4</sup>	Habitat Description/Analysis Rationale
Black footed ferret ( <i>Mustela nigripes</i> )	E	NO	NO	NO	Prairie dog towns (USFWS 2011a). No reintroduction sites or other known suitable habitat in the project area.

<sup>1</sup>E = Endangered in Custer County.

<sup>2</sup>Confirmed records of species in project area or immediate vicinity.

<sup>3</sup>Habitat Present-Suitable habitat known or suspected to occur.

<sup>4</sup>Further Analysis Provided-If the species is not suspected to occur and if suitable habitat is not present or habitat would not be affected by the proposed project then no further effects analysis for that species is necessary because they would not be expected to be adversely affected by the project as proposed. Refer to the Habitat Description/Analysis Rationale in the full BA/BE.

**Region 2 (R2) Sensitive Species**

The current sensitive species list for the Rocky Mountain Region (R2) was renewed on June 10, 2011. Sensitive species for the Black Hills National Forest are listed on the R2 threatened, endangered and sensitive species home page (USDA Forest Service 2011). There are now 26 species on the Region 2 sensitive species list that could be present in the Black Hills.

The pre-field review of Region 2 Sensitive Species and Federally Endangered and Threatened and Proposed species was completed using survey results, district records, and communication with District personnel, literature reviews, on-line databases, and South Dakota Natural Heritage Database. The red-belly snake and northern leopard frog have both been observed in the project area.

No critical habitat exists in the Lakes Enhancement project area for the following species: fringed myotis, Townsend’s big-eared bat, hoary bat, black-tailed prairie dog, American marten, bighorn sheep, bald eagle, Northern goshawk, loggerhead shrike, grasshopper sparrow, or Cooper’s mountain snail. Some of these species are likely to forage in the area during fall and winter months. Most likely in the first winter when the lakes are drained, eagles will benefit from the amount of dead fish available. Bighorn sheep may move through the area, but preferred

habitat is lacking within the project area. Because suitable habitat does not exist or is not going to change from this project, a determination of ‘*no impact*’ was made for the above species.

## Determination Summary

### Botany

The lake dredging itself would have no effect to any sensitive plant species or habitat. The haul routes are on existing roads and the disposal sites either occur in old gravel/borrow pits or in meadows that are dominated by smooth brome (*Bromus inermis*). None of which are potential habitat for R2 sensitive plant species.

There are no known R2 Sensitive plant species that have been located within the project area and no known potential habitat exists for any of these species; consequently, no further analysis is needed. However, there is a remote chance unknown individuals may exist within the project area. Therefore, the following determination is valid: “*May adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend for federal listing.*”

### Wildlife

The determination of effects on federally listed species and Region 2 Sensitive Species in this BA/BE were made as the result of the information gathered in the pre-field review, field reconnaissance, and effects analysis. The basis for these determinations was potential habitat, distribution, effects from forest activities, and the Black Hills National Forest Plan, including the Phase II Amendment (Standards and Guidelines). The determination language is set forth in Forest Service Manual 2670 and by the USFWS.

Objectives, standards, and guidelines have been identified in the Forest Plan that protect all federally listed species and conserve R2 sensitive species found in the Black Hills. In addition, the Forest Plan Phase II Amendment provides for additional direction for the protection of habitat for these species. This project’s action alternatives would follow the objectives, standards, and guidelines that are applicable to those species and habitats found in the HCMB Project Area.

With implementation of Forest Plan and the Forest Plan Phase II Amendment a determination of ‘*may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing*’ is made for the following species: Black Hills redbelly snake, northern leopard frog, and regal fritillary. A determination of ‘*no impact*’ is made for all other R2 sensitive species not listed here.





**Appendix E:**  
**Past, Present & Future Activities**



## APPENDIX E: Past, Present, and Future Activities

**Table E - 1. Past Accomplished Activities**

Date of Activity	Activity Description
2001-2003	Grizzly Timber Sale Unit-thinning at Lakota Lake entrance road.
2004	Horsethief Lake Campground Reconstruction
2006	Horsethief Lake Day Use Fishing Site – fishing platforms and boardwalk trail construction
2008-2009	Peter Norbeck National Scenic Byway roadside cutting and chipping of non-commercial size pine trees (<9” diameter)
2008	Bismarck Lake Campground reconstruction
2008	Horsethief Lake east shoreline erosion repair and timber frame and gravel fill trail construction
2008	Horsethief Lake parking lot paving, retaining wall constructed, main fishing platform sidewalk built.
2008-2010	Bismarck Lake Day Use Area picnic site, shoreline trail, interpretive panel and overlook point reconstruction
2012-2013	Palmer Timber Sale implementation of adjacent stand trees west of Horsethief Lake Campground.

**Table E - 2. Present Activities**

Activity Description
Camp Bob Marshall, campground, day use areas & trail maintenance in Project Area
Annual Fish Stocking at Project Lakes By SDGFP
Annual water quality (TMDL) monitoring at Horsethief Lake by SDDENR
Annual Norbeck Wildlife Monitoring (Lakota & Horsethief Lake areas)
Noxious weed monitoring & treatment as needed - all project area

**Table E - 3. Reasonable Foreseeable Future Activities**

Date	Activity Description
2013-2014	Continued logging slash pile burning and rehabilitation in Palmer Timber Sale Unit 50, located west of Horsethief Lake.
2013-2015	Construct Osprey platforms near shoreline of project lakes.
2014-2016	Reconstruct tent pads in Horsethief Lake Campground



# **Appendix F: Sediment Data**



## APPENDIX F: Sediment Data

**Table F - 1. Lakota Lake Estimated Sediment Volumes by GIS Sediment Polygons**

Polygon ID	Polygon Acres	Polygon Yards Square	Average Meter Sediment Depth	Average Yards Sediment Depth	Cubic Yards
1	0.029	140.36	1.06	1.15964	162.7671
3	0.063	304.92	1.37	1.49878	457.008
5	0.061	295.24	1.37	1.49878	442.4998
6	0.008	38.72	1.37	1.49878	58.03276
7	0.098	474.32	1.37	1.49878	710.9013
8	0.007	33.88	0.75	0.8205	27.79854
10	0.117	566.28	1.06	1.15964	656.6809
11	0.015	72.6	1.06	1.15964	84.18986
12	0.178	861.52	0.75	0.8205	706.8772
13	1.28	6195.2	1.67	1.82698	11318.51
14	7.611	36837.24	0.16	0.17504	6447.99
15	0.757	3663.88	0.16	0.17504	641.3256
<b>Total Acres: 10.224</b>			<b>Total Volume: 21,714.58</b>		

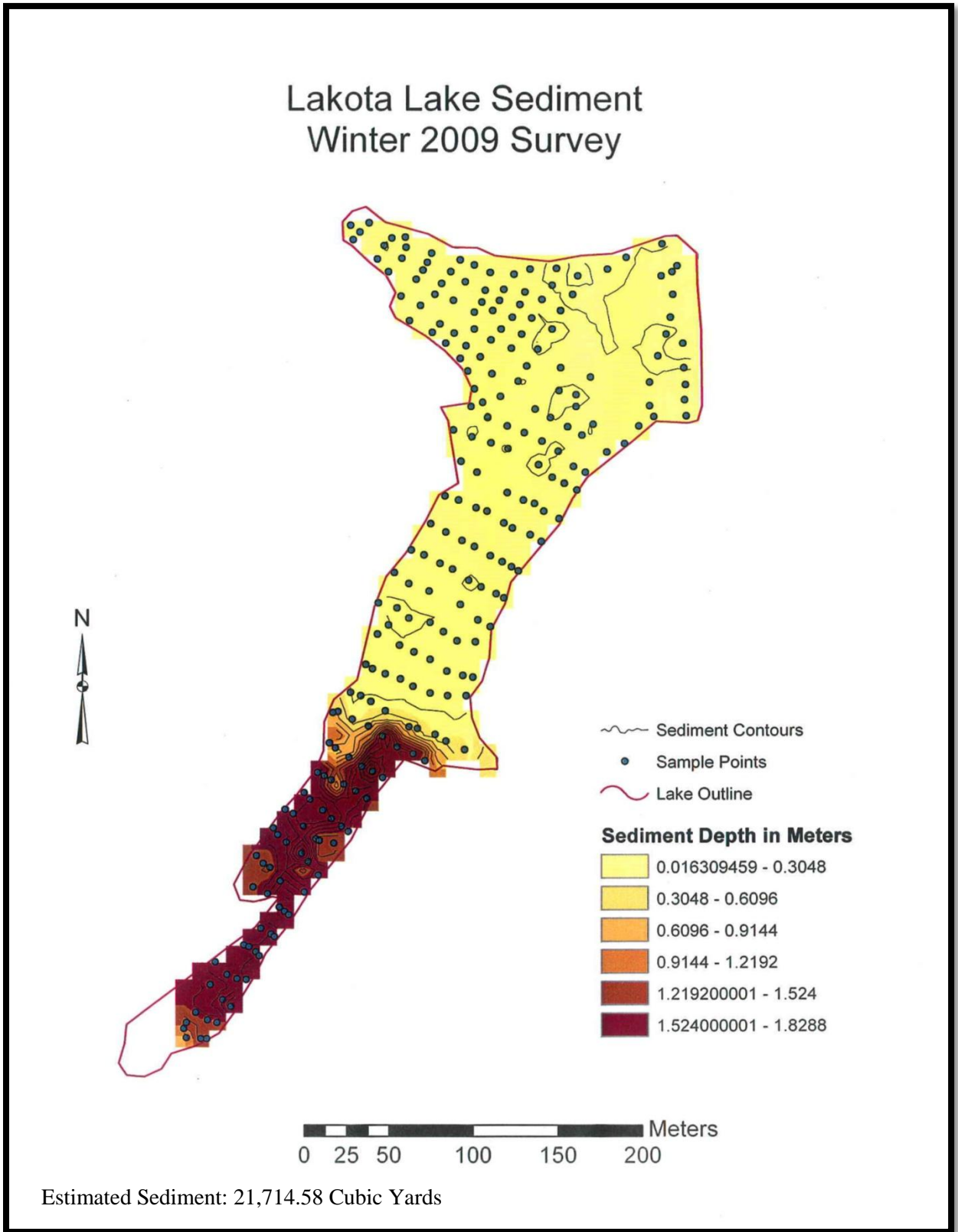
**Table F - 2. Horsethief Lake Estimated Sediment Volumes by GIS Sediment Polygons**

Polygon ID	Polygon Acres	Polygon Yards Square	Average Meter Sediment Depth	Average Yards Sediment Depth	Cubic Yards
16	0.15	726	0.5	0.547	397.122
17	0.08	387.2	0.75	0.8205	317.6976
18	0.15	726	0.5	0.547	397.122
19	0.26	1258.4	0.5	0.547	688.3448
20	1.76	8518.4	0.5	0.547	4659.565
21	0.05	242	0.5	0.547	132.374
22	0.05	242	0.5	0.547	132.374
23	0.06	290.4	0.5	0.547	158.8488
24	1.86	9002.4	0.5	0.547	4924.313
25	0.29	1403.6	0.75	0.8205	1151.654
26	0.08	387.2	0.5	0.547	211.7984
27	0.34	1645.6	0.75	0.8205	1350.215
29	0.03	145.2	1.06	1.15964	168.3797
31	0.09	435.6	0.75	0.8205	357.4098
32	0.02	96.8	0.19	0.20786	20.12085
34	0.01	48.4	1.06	1.15964	56.12658
35	9.85	47674	0.18	0.19692	9387.964
<b>Total Acres: 15.13</b>			<b>Total Volume: 24,511.43</b>		

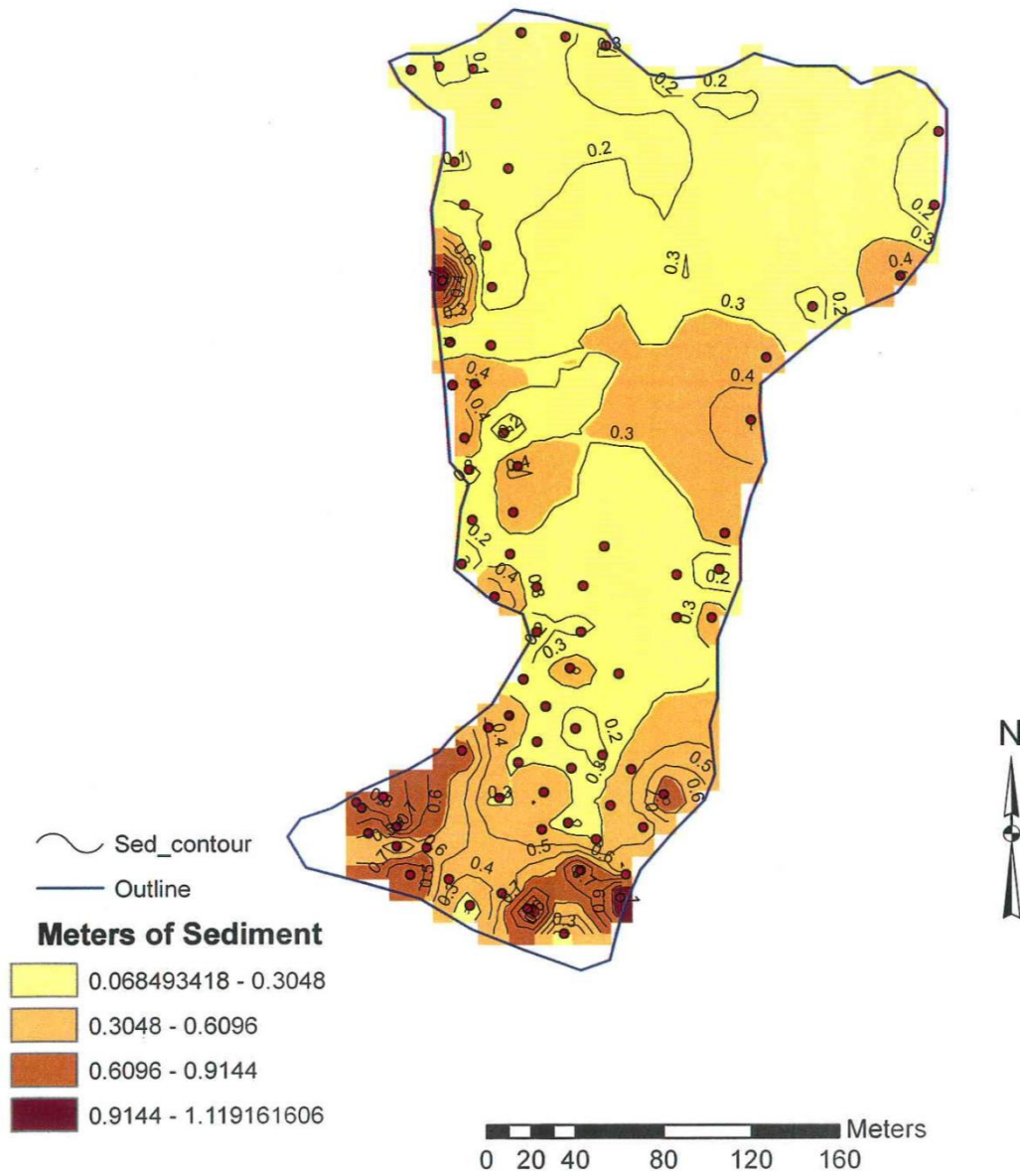
**Table F - 3. Bismarck Lake Estimated Sediment Volumes by GIS Sediment Polygons**

<b>Polygon ID</b>	<b>Polygon Acres</b>	<b>Polygon Yards Square</b>	<b>Average Meter Sediment Depth</b>	<b>Average Yards Sediment Depth</b>	<b>Cubic Yards</b>
36	0.23	1113.2	0.31	0.33914	377.5306
37	0.3	1452	0.52	0.56888	826.0138
38	0.21	1016.4	0.52	0.56888	578.2096
39	0.03	145.2	0.52	0.56888	42.95272
40	0.06	290.4	0.52	0.56888	85.90543
42	0.07	338.8	0.52	0.56888	100.223
43	0.1	484	0.52	0.56888	143.1757
47	4.9	23716	0.31	0.33914	2493.344
48	0.2	968	0.94	1.02836	935.7253
49	0.04	193.6	0.94	1.02836	187.1451
50	0.02	96.8	0.94	1.02836	93.57253
51	0.01	48.4	0.94	1.02836	46.78627
52	0.03	145.2	0.94	1.02836	140.3588
53	0.16	774.4	0.94	1.02836	748.5803
54	0.04	193.6	0.94	1.02836	187.1451
55	0.07	338.8	0.94	1.02836	327.5039
56	0.11	532.4	0.94	1.02836	514.6489
57	0.33	1597.2	0.73	0.79862	931.1558
58	0.85	4114	0.52	0.56888	1216.994
59	0.14	677.6	0.73	0.79862	395.0358
60	0.04	193.6	0.31	0.33914	20.35383
61	0.08	387.2	0.94	1.02836	374.2901
62	0.06	290.4	0.94	1.02836	280.7176
63	0.48	2323.2	0.73	0.79862	1354.408
64	0.09	435.6	0.31	0.33914	45.79611
66	0.06	290.4	0.31	0.33914	30.53074
67	0.8	3872	0.31	0.33914	407.0765
68	0.16	774.4	0.31	0.33914	81.4153
69	6.34	30685.6	0.52	0.56888	9077.341
70	0.55	2662	0.31	0.33914	279.8651
71	2.56	12390.4	0.31	0.33914	1302.645
72	0.06	290.4	0.1	0.1094	3.176976
73	0.18	871.2	0.1	0.1094	9.530928
74	0.08	387.2	0.1	0.1094	4.235968
75	2.58	12487.2	0.1	0.1094	136.61
76	2.19	10599.6	0.1	0.1094	115.9596
<b>Total Acres: 24.21</b>				<b>Total Volume: 23,895.96</b>	

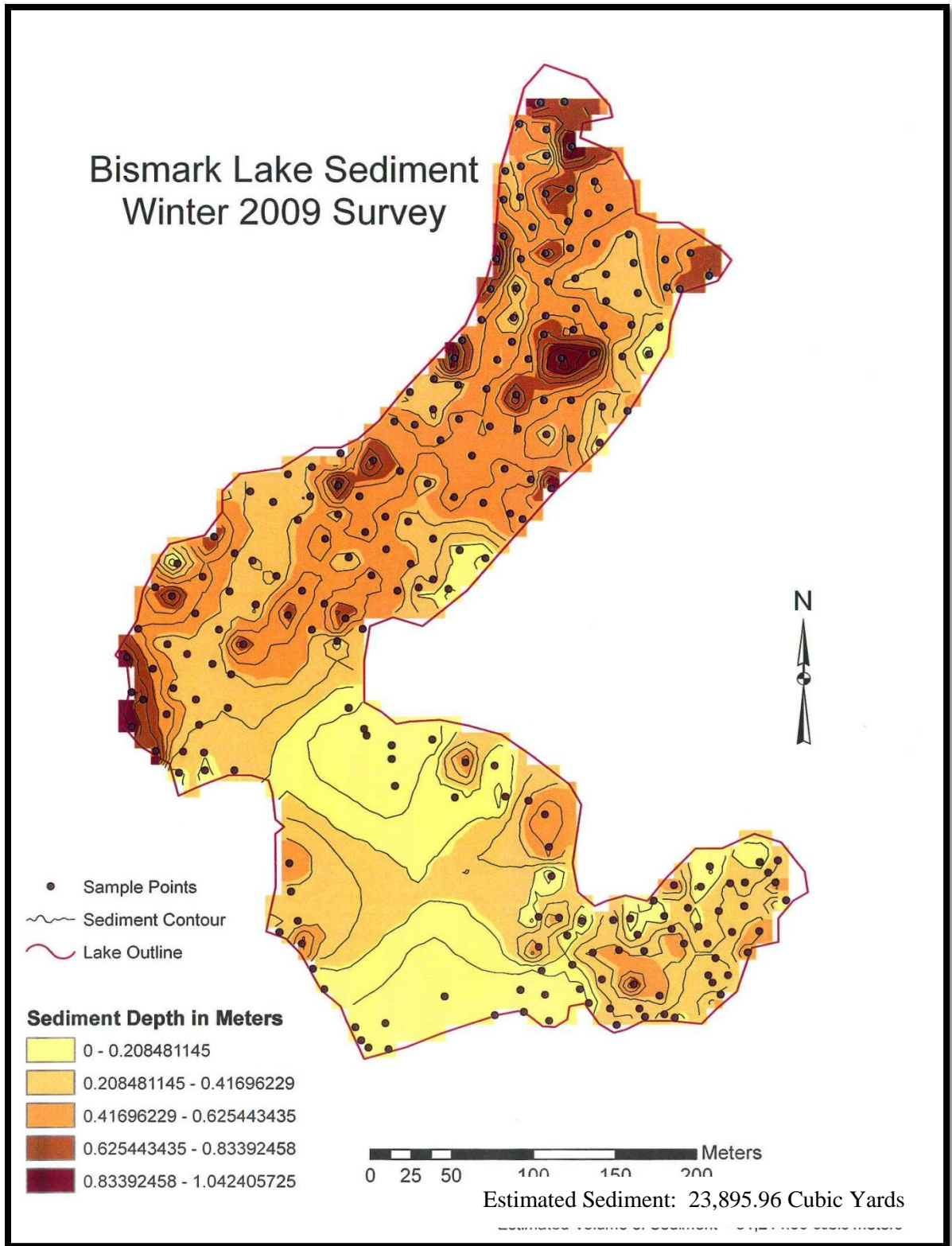




# Horsethief Sediment Winter 2009 Survey



Estimated Sediment: 24,511.43 Cubic Yards





**Appendix G:**  
**Response to Comments**



## APPENDIX G: Response to Comments

The Hell Canyon Ranger District received four comments on the Byway Lakes Enhancement Project Environmental Assessment from individuals and groups. These comment letters and emails are located in the Project Folder. All original correspondence is stored within the project file. The following number list corresponds to the Comment/Response table below.

1. Brian Brademeyer – Friends of the Norbeck, [Email](#)
2. Eric Porisch – President, Black Hills Sportsmen Club, [Letter](#)
3. Everett E. Hoyt – Private Citizen, [Letter](#)
4. Al Johnson – President, Forest Recreation Management, Inc., [Email](#)

Comment Number	Name	Comment	Response
1	Brian Brademeyer Friends of the Norbeck	I have looked over the Draft EA for the Lakes Dredging Project. Thanks for dropping the dam face options for sediment deposit sites.	Thank you for the support of this project.
2A	Erick Porisch, President Black Hills Sportsmen Club	We appreciate that the USFS and SD Game, Fish and Parks are prepared to proceed to restore these lakes to improve water quality and recreation opportunities. BHSC supports the reconstruction of lake bed in such as manner as to provide fishery habitat through construction of lake contours and structure. We also support the plan to dispose of removed sediment at sites a short distance from the lakes in a manner which will accommodate reclamation of the sediment disposal area.	Thank you for the support of this project.
2B		As we observe the runaway aquatic weed growth in Canyon Lake in Rapid City, we would like to encourage USFS to take whatever measures are possible during and after renovation of the Byway lakes to prevent unwanted weed growth following renovation of the Byway Lakes.	Your comment is noted. Sediment removal will assist greatly with reducing nutrient, ph levels, and lowering water temperatures to help keep aquatic weed growth low. Normal operation and

			<p>maintenance of the Byway Lakes includes removal of lake weeds and vegetation near shore areas by hand crews. Runaway weed growth, if it occurs in the future, may be dealt with by future management actions after planning and analyses occurs and as resources are available.</p>
2C		<p>BHSC would also recommend that unwanted fish species be eliminated from the residual pools during renovation so that upon completion of the renovation, the “new” lakes would have a fresh start with only the desired fish species in the lake.</p>	<p>Effects to remaining fish (both desirable and undesirable species) in the residual pools after draining the Byway Lakes is expected to result in a total kill due to frozen water and/or lack of available dissolved oxygen. The proposed action does not include using fish poisons.</p>
3A	Everett Hoyt	<p>In general we are very pleased that USFS and SDGFP are proposing to renovate the Byway Lakes, and we believe that the effort is long overdue!</p>	<p>Thank you for the support of this project.</p>
3B		<p>We are concerned, however by the significant differences in estimates by USF and SDGFP and we encourage USFS/SDGFP to budget and bid the removal of a “worst case” amount of sediment.</p>	<p>Your comment is noted. The project contract will allow additional quantities of dredging sediments possible if needed as “additive bid items”. The Byway Lakes Enhancement Project proposes to remove as much sediment as possible given lake bottom terrain, weather conditions, ability to drain each lake effectively, budgets, etc. A clearer picture of how much sediment can be removed with this project considering all variables will develop over time and adjustments can occur for the project to be most effective.</p>



<p>3C</p>		<p>We are pleased to see that the Project Partners are not simply digging a hole behind a dam, but that the design for the lake bottoms includes specific contours. In addition, fish habitat structures will add significantly to the enhancement of the largely put-and-take fisheries. Use of native rock will lend a more natural appearance than the convenient limestone rip-rap which is used too often in lake and stream projects. Construction of osprey nest platforms in the vicinity of the lakes will add to the outdoor experience by lake users as they see an Osprey dive to catch one of the rainbow trout cruising near the surface of the lake.</p>	<p>Thank you for the support of this project.</p>
<p>3D</p>		<p>Efforts should be made to control significant sources of silt inputs to the lake through construction of small upstream silt check-dams which could be cleaned periodically with small mechanized equipment (e.g. backhoes, excavators, dump truck), thereby protecting the larger water body where more complex measures would be necessary to remove silt-such as the present project.</p>	<p>Sediment sources from inlet streams and areas of disturbance were mostly from earlier times of poorly regulated mining, road building and logging, which were then exacerbated by the historic 1972 floods (Byway Lakes Project EA page 2). Adding silt check-dams upstream of lake inlets is beyond the scope of this project and outside of the project area. However, stream - riparian health is a concern and the USFS does treat and prevent erosion of inlet streams. In the case of Iron Creek and Pine Creek Watersheds, this is primarily accomplished by planting streamside willows and hiking and horse trail water crossing maintenance (Iron Creek Trail #15, Grizzly Creek Trail #7 and Centennial Trail #89).</p>
<p>3E</p>		<p>We are disappointed that SDGFP has retreated from its</p>	<p>See response to 2C.</p>

		initial plan to completely remove undesirable fish species from the residual pool in each lake during construction.	
3F		Aquatic vegetation is essential to fish and invertebrate health in the lake, but too much vegetation can choke the lake and become detrimental to water quality and make the lake unusable for fishing and undesirable for water recreation.	Thank you, your comments have been noted.
3G		We would suggest transplanting, jump-starting, and maintaining a food source for fish in the Byway Lakes-bread crumbs just don't get it done in providing a healthy diet for Black Hills trout!	Thank you, your comments are noted. The Byway Lakes Enhancement Project goal is to remove sediment for fisheries and recreation. Adding a food source to the lakes is outside the scope of this project.
4A	Al Johnson Forest Recreation Management, Inc.	Forest Recreation Management, Inc. and Recreational Adventures, Co. both strongly endorse the proposal.	Thank you for the support of this project.
4B		I especially appreciate the concern given to completing the work in the "off-season" with the only impact on the main operating season of the recreation sites being the time it takes the lakes to refill after the work is completed. I could not find language in the proposal that explicitly state that campground and the picnic areas at the lakes will be able to open and operate for their regular dates after the projects are completed. In other words, if Horsethief Lake, for example, refills slowly, the campground should be able to operate even if the lake is only half full. The other comment would be that the RFP clearly mandate that the contractor must complete the work during the off-season, as the proposal states.	As noted the timing of this project for implementation will not impact the primary recreation season from mid-May to Labor Day Weekend, annually, and recreation sites may open as normal. Construction contract specifications will ensure that these dates are honored as well.

