



United States Department of the Interior

BUREAU OF RECLAMATION

Dakotas Area Office
P.O. Box 1017
Bismarck, North Dakota 58502



DK-5000-09-01
ENV-6.00

JUN 26 2009

Subject: Notification of Availability of the Angostura Reservoir Resource Management
Plan Environmental Assessment

Dear Interested Party:

The Bureau of Reclamation, Dakotas Area Office, has completed a finding of no significant impact (FONSI) of the environmental assessment (EA) for the Angostura Reservoir Resource Management Plan. The EA evaluated the potential impacts to the human and natural environment associated with the Proposed Action Alternative. It proposes improvements to visitor use facilities, recreation opportunities, natural resources, and would limit degradation of natural and cultural resources while developing diverse recreation opportunities consistent with goals and objectives.

Reclamation's Dakotas Area Office is the federal agency responsible for administering lands and resources at Angostura Reservoir. Reclamation is responsible for ensuring compliance with the National Environmental Policy Act, the National Historic Preservation Act, and related environmental and cultural resource laws.

Reclamation has determined that a FONSI is appropriate for the Proposed Action. The construction of the project described in the FONSI and in accordance with the environmental commitments will ensure there are no significant impacts to the human or natural environment.

A copy of the FONSI can be found at <http://www.usbr.gov/gp/dkao>. Additional copies of the FONSI may be obtained by calling Tara Piper, Natural Resource Specialist, at 605-394-9757 extension 3011, by e-mail to TPiper@usbr.gov, or in writing to the Rapid City Field Office at 515 Ninth Street, room 101, Rapid City, South Dakota 57701.

Sincerely,

Dennis E. Breitzman
Area Manager

RECLAMATION

Managing Water in the West

Final Environmental Assessment for the Angostura Reservoir Resource Management Plan DK-5003-09-01



U.S. Department of the Interior

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

Mission of the Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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ACRONYMS AND ABBREVIATIONS

BLM	U. S. Bureau of Land Management	O&M	Operation and Maintenance
		Project	Angostura Reservoir
BMP	Best Management Practices	Reclamation	Bureau of Reclamation
CEC	Categorical Exclusion Checklist	RMP	Resource Management Plan
		ROD	Record of Decision
CCC	Civilian Conservation Corps	ROW	Right-of-Way
USACE	U.S. Army Corps of Engineers	TDS	total dissolved solids
		TSI	Trophic State Index
CWA	Clean Water Act	TSS	Total Suspended Solids
District	Angostura Irrigation District	SAR	Sodium Adsorption Ratio
EA	Environmental Assessment	SC	Specific Conductivity
EPA	U.S. Environmental Protection Agency	SDWA	Safe Drinking Water Act
		SDDENR	South Dakota Department of Environment and Natural Resources
ESA	Endangered Species Act		
FONSI	Finding of No Significant Impacts	SDGFP	South Dakota Department of Game, Fish and Parks
GIS	Geographical Information System	USFWS	U.S. Fish and Wildlife Service
IPM	Integrated Pest Management		
ITA	Indian Trust Assets	SHPO	State Historic Preservation Office
MU	Management Unit		
MOU	Memorandum of Understanding	USFS	U. S. Forest Service
		USGS	U.S. Geological Survey
NEPA	National Environmental Policy Act	cfs	cubic feet per second
		gpm	gallons per minute
NHPA	National Historic Preservation Act	KWh	kilowatt-hours
		ml	milliliter
NRHP	National Register of Historic Places	ppm	parts per million

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF RECLAMATION
DAKOTAS AREA OFFICE
BISMARCK, NORTH DAKOTA

FINDING OF NO SIGNIFICANT IMPACT

AND

FINAL ENVIRONMENTAL ASSESSMENT
ANGOSTURA RESERVOIR
RESOURCE MANAGEMENT PLAN

FONSI NUMBER DK-5003-09-01

Recommended: Tara S. Piper Date: June 19, 2009
Preparer
Dakotas Area Office

Concur: Ronald Nelson Date: 19 June 2009
Chief, Technical Studies and Environmental Management
Dakotas Area Office

Approved: Dennis E. Britton Date: 6/19/09
Area Manager
Dakotas Area Office

Resource Management Plan Selection and Finding of No Significant Impact Determination

The Bureau of Reclamation has completed a final environmental assessment (EA) for the Angostura Reservoir Resource Management Plan (RMP). The purpose of the RMP is to develop and implement a 20 year plan, ending in 2029, which contains the recreation and natural resource information essential to effective resource management at Angostura Reservoir. The RMP would also establish goals and objectives for land management actions compatible with the authorized purposes of the reservoir.

Two alternatives were evaluated, the No Action Alternative and the Proposed Action Alternative. The No Action Alternative serves as a basis of comparison for potential impacts of the Proposed Action. Under the No Action Alternative management of the Recreation Area would continue as outlined in existing operating plans, current laws, new or amended regulations, and policy. The 1992 Master Plan would continue to be used for management of the area. In addition to the Master Plan, improvements would be made on an "as needed" basis, or if needed to meet health, safety, American's with Disabilities Act (ADA) or other legal requirements.

Under the Proposed Action Alternative, current operation and maintenance activities described under the No Action Alternative would continue along with a variety of improvements to visitor use facilities, recreation opportunities, and natural resources, including additional recreation developments in Management Units (MU) 2, 4, 5, 9, 10, 12, and 19. This alternative would limit degradation of natural and cultural resources while developing diverse recreation opportunities consistent with the MU Goals.

We have determined that the Proposed Action is Reclamation's Selected Alternative and, as described in the EA, will not result in significant impacts to the human and natural environment; therefore, an environmental impact statement will not be prepared for this action. Analysis of the proposed action's anticipated environmental impacts is contained in the EA and is incorporated by reference in this Finding of No Significant Impact (FONSI).

Reasons for FONSI Determination

The reasons for the FONSI determination are summarized as follows:

1. This alternative will not impact the contract for irrigation water with the Angostura Irrigation District.

2. All applicable Federal, State, and local environmental laws, regulations, and executive orders will be followed. This alternative includes compliance with laws and policies for exclusive use, accessibility, off-road vehicle use, land use authorizations, oil, gas, and mineral exploration, and control of noxious weeds, invasive species, and other pests.
3. There will be no impacts to paleontological resources with environmental commitments in place.
4. There will be no significant impacts to soil resources as soil characteristics will be taken into account during planning. Soils within individual MUs were looked at for suitability for recreational development, soil depth, and drainage characteristics for vegetative growth and management. Table 3-1 shows soil characteristics for each MU.
5. There will be no negative impacts to water quality from recreation and land management, and a positive impact from waste disposal systems and management of upland areas.
6. There will be minor loss of rangeland vegetation and no impacts to natural communities. Loss of vegetation will be localized with implementation of the proposed management activities. No negative impacts will occur in MUs 15, 17, 18, and 22 with the RMP land use and natural resource objectives in place.
7. There will be no impacts to wetlands and riparian areas with environmental commitments in place. No negative impacts will occur to wetlands and riparian areas with RMP land use and natural resource objectives in place.
8. There will be no impacts to wildlife and fish habitats with environmental commitments in place. No negative impact to wildlife will occur with land use and natural resource RMP objectives in place.
9. There will be no impacts to State and Federally Protected Species and Species of Special Concern with environmental commitments and land use and natural resource RMP objectives in place.
10. No significant impacts to historic properties will occur. All stipulations of the National Historic Preservation Act (NHPA) and other applicable federal laws, regulations, and guidelines concerning cultural resources shall be followed.
11. There will be a minor impact to users due to elimination of free camping areas. However, the positive impact will be increased recreation facilities due to additional revenues generated.

Environmental Commitments

The following environmental commitments will be included in the RMP and followed when implementing the selected alternative.

National Environmental Policy Act Compliance

Management actions proposed in the future that are determined by Reclamation to go beyond the scope of the analysis described in Chapter 3 would be evaluated for additional NEPA analysis.

Soils

A review and determination of soil suitability for proposed management actions shall be conducted prior to construction.

Water Quality

Management actions which are proposed within wetlands or waters of the U.S., including those identified in Map 3-2 NWI map of Angostura lands will be conducted in compliance with Section 404 of the Clean Water Act and Executive Order 11990.

Natural Resources

Noxious weed and pest control will occur in accordance with the Dakotas Area Office Integrated Pest Management Plan and federal, state and local regulations.

Dead trees, with the exception of trees which are removed to meet recreation or resource management objectives, will be allowed to deteriorate and/or will be replaced with native tree species common to the Angostura Reservoir area with special attention to the use of woody trees and shrubs, such as those listed in Table 3-3 in Chapter 3, and using expertise available from the National Resource Conservation Service.

Planning for tree plantings will include consideration of the goals and objectives for the MU and of the appropriateness of the tree species and planting design for the site, as well as protection and, or restoration of native prairie.

Any areas, which pose a hazard to wildlife as a result of construction or development activities, will be adequately protected (e.g. fenced, netted) to prevent wildlife access.

In accordance with Reclamation's Great Plains Regional policy, all new or replacement utility lines will be buried. If an exception to this is granted by Reclamation, lines and/or towers will be designed and located to avoid migratory bird collisions and/or electrocutions pursuant to Avian Power Line Interaction Committee protocol (2005 and 2006) and the U. S. Fish and Wildlife Service's Interim Guidelines for Communications Tower Siting, Construction, Operation, and Decommissioning (2000). Expanded protection for above-ground power lines will include a number of measures. There will be a provision of greater than 90-inch spacing between conductors or grounding features. Exposed conducting features will be appropriately insulated. Anti-perching devices will be required as appropriate. Steel pole use will be avoided, where practical. Line aviation markers will be used where power lines are adjacent to wetlands or where wetlands are crossed, native prairie, and migratory bird feeding areas.

State and Federally Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats

Proposed management actions will be evaluated by SDGFP and Reclamation to determine any potential effects. Reclamation has determined that implementation of the Proposed Action will not impact State and Federally Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats. To ensure that no impacts occur as management actions are planned and implemented Reclamation and SDGFP will undertake the following steps:

- Update evaluations of populations or habitat for State and Federally listed species
- Update evaluations of populations or habitats for Species of Special Concern
- Update evaluations of migratory bird use of the project area
- Update evaluations of native prairie including sand sagebrush/prairie sandreed shrubland
- Update evaluations of riparian habitat

These ongoing evaluations would include a determination if the species or habitat exists in the Project Area; the potential impacts to the species or habitat; and determine steps to avoid, minimize, or mitigate the impact in accordance with the goals and objectives for the RMP and all state and federal laws.

If any threatened or endangered species are encountered during construction or development activities, Reclamation would initiate consultation with the U.S. Fish and Wildlife Service to determine appropriate steps to avoid any effects to these species, including stopping new development activities.

If any State Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats are encountered during construction or development activities, Reclamation will consult with SDGFP to comply with state laws.

Cultural Resources

Reclamation will conduct all activities necessary to comply with Section 106 of the NHPA for all actions associated with the selected alternative. The preferred management treatment for historic properties will be to avoid adverse effects during the implementation of activities in undertaking areas as defined in [36 CFR 800.5(c)(2)]. Reclamation shall comply with 36 CFR Part 800.4(c) to evaluate the historic significance of previously unevaluated cultural resource sites in undertaking areas if they cannot be avoided.

If during the course of any activities associated with the undertaking, any districts, sites, buildings, structures, or objects are discovered, activities will cease in the vicinity of the resource, and the stipulations of 36 CFR Part 800.13 will be satisfied before activities in the vicinity of the previously unidentified property can resume.

Paleontology

There are known paleontological resources in Cretaceous formations in portions of MUs 2, 4, 7, 12, 13, 14, 15, and 17. Management activities proposed in these MUs involving the disturbance of Cretaceous bedrock has the potential to expose and/or damage significant resources. Reviews will be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys/collection/excavation may be conducted to mitigate loss.

Cretaceous formations in portions of MUs 1, 5, 6, 7, 8, 9, 10, 14, 16, 20, 21, 22, 23, and 24 have a high potential to contain significant fossils. Management activities proposed in these MUs involving the disturbance of Cretaceous bedrock have the potential to expose and/or damage significant resources. Reviews will be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys, collection, or excavation may be conducted to mitigate loss.

Quaternary formations in portions of MUs 3, 4, 5, 11, 12, 13, 14, 15, 17, 18, 19, 20, and 21 have low potential for fossil occurrences. Management activities proposed in these MUs involving the disturbance of Quaternary formations have minor potential to expose and/or damage significant paleontological resources. Reviews shall be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys, collection, or excavation may be conducted to mitigate loss.

1 Introduction

The Bureau of Reclamation's Dakotas Area Office is the federal agency responsible for administering lands and resources associated with Angostura Reservoir and has begun preparing a Resource Management Plan (RMP). The RMP would become the plan for future use, management, and development for the reservoir. Angostura Reservoir lands are federal lands managed through an agreement with Reclamation, by South Dakota Department of Game, Fish & Parks (SDGFP). In accordance with the National Environmental Policy Act (NEPA) of 1969, Reclamation has prepared an Environmental Assessment (EA) for the RMP.

This EA evaluates the impacts of a Preferred Alternative and a No Action Alternative. It is intended to help decision makers determine whether to issue a Finding of No Significant Impact (FONSI) or to proceed with preparation of an Environmental Impact Statement. The selected alternative would become the RMP.

1.1 Proposed Federal Action

The proposed Federal action is to develop and implement the Preferred Alternative, the RMP, as presented in this EA. The RMP would become the plan for future use, land management and development for Angostura Reservoir.

1.2 Purpose and Need

The purpose of this proposed action is to develop and implement a 20 year plan, ending in 2029, which contains the recreation and natural resource information essential to effective resource management at Angostura Reservoir. The RMP would also establish goals for desirable use levels and appropriate types of land management actions compatible with the authorized purposes of the reservoir.

Public use of Angostura Recreation Area is expected to increase due to the growing population in and around the Black Hills, improved access, and new recreation developments associated with the reservoir. This RMP is needed to guide future developments, maximize recreational benefits, minimize resource use conflicts, and manage and protect resources.

1.3 Authority for Resource Management Plans

Title 28 of P.L. 102-575, Section 2805 (106 Statute 4690, Reclamation Recreation Management Act of October 30, 1992) provides Reclamation with authority to prepare RMPs. The act further provides that each RMP shall be consistent with applicable laws (including any applicable statute, regulation, or Executive Order), shall be developed in consultation with appropriate heads of federal and non-federal departments or agencies, the authorized beneficiaries of any

Reclamation Project, and with appropriate public participation. Each RMP shall provide for the development, use, conservation, protection, enhancement, and management of resources of Reclamation lands in a manner that is compatible with the authorized purposes.

Reclamation’s Recreation Management Policy (LND P04) defines Reclamation’s overall responsibilities and establishes the basic principles for planning, development, management, and protection of public recreation resources on Reclamation’s lands and waters. One of the principles outlined in this policy is: “Conduct necessary planning studies, research, assessment, and public involvement processes, in conjunction with managing partners where possible, to provide recreation facilities commensurate with public needs and Reclamation responsibilities and objectives”.

1.4 Background to the Purpose and Need

Angostura Unit

The Angostura Unit, which includes Angostura Dam and Reservoir and the Angostura Irrigation District (District) water delivery system, was authorized under the Water Conservation and Utilization Act of 1939 and then reauthorized by the Flood Control Act of 1944 as part of the Pick-Sloan Missouri Basin Program. It is located on the Cheyenne River, approximately 9 miles southeast of Hot Springs, South Dakota, on the southeastern edge of the Black Hills in Custer and Fall River Counties. Construction began on August 23, 1946, and was completed on December 7, 1949. The first delivery of irrigation water was made in 1953. The Angostura Unit provides multipurpose benefits, such as, irrigation, flood control, fish and wildlife conservation, recreation, and sediment control, with the primary function being to impound and deliver a full supply of irrigation water for production of forage and grain crops.

The District has operated and maintained Angostura Dam and water delivery system through an agreement with Reclamation since January 1, 1968. In addition to this agreement, Reclamation has a contract with the District to deliver available water in the active conservation pool as illustrated in Figure 1. The water delivery system provides water to 12,218 acres of lands that extend 24 miles downstream of the dam along the Cheyenne River.

The RMP would include background information on the District and other water contracts, but would not address Reservoir water operations, irrigation facilities, or lands within the District.

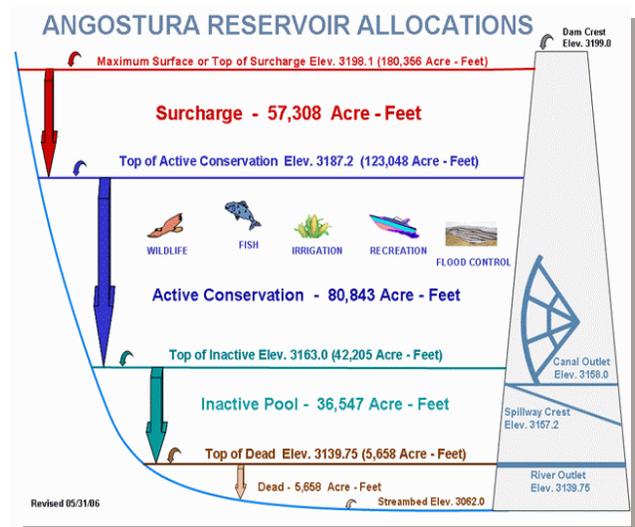


Figure 1 Angostura Reservoir Allocations

Resource Management Area

Angostura is one of the few large reservoirs in western South Dakota. The reservoir's sandy beaches and diverse warm water fishery make it a popular recreation area. The average depth is 29 feet and the deepest portion of the pool is 75 feet deep when full. The reservoir's average summer temperature is 66 degrees Fahrenheit. The reservoir has 47 miles of shoreline.

Currently, there are five different Management Unit (MU) types at Angostura Reservoir based on existing use of the land. The MU types are Angostura Dam Operations, Developed Recreation, Primitive Recreation, Cabin and Trailer Areas, Game Production Area, and Angostura Reservoir. The Project Area is shown on Map 1-1. Currently SDGFP Division of Parks and Recreation manages MUs 1 – 14, 16 – 20 and 22-25; SDGFP Division of Wildlife manages MU 15; and the District manages MU 21. Management goals and objectives were developed for each MU and can be found in Appendix A: Resource Management Plan Goals and Objectives.

The RMP would address all resources within Reclamation's boundary around Angostura Reservoir. This includes approximately 4,700 surface-acres of water at the top of active conservation, surface elevation 3187.2 and approximately 4,548 acres of land within Reclamation's boundary. SDGFP has administered recreation, fisheries, and wildlife management activities at Angostura Reservoir since 1954. Lands managed by SDGFP include approximately 823 acres of developed recreation, 2,095 acres of primitive recreation, 72 acres permitted for cabins and trailers, and 1,422 acres of game production area. The remaining 136 acres are managed by the District for the operation and maintenance of Angostura Dam.

The semiarid climate of the Angostura area is typical of the Northern Great Plains. Summers are hot during the day and cool at night. Winters are long and cold, with periods of sub zero temperatures. July is the hottest month of the year, with average temperatures of 74 degrees. The coldest month is January, with average temperatures of 24 degrees. The average growing season extends from mid-May to late September.

Although precipitation varies widely from year to year, the average is 16.06 inches per year at Oral, most of which occurs from April-September. From April-August, average rainfall is 11 inches. Snow provides another 4-5 inches of precipitation a year. (Reclamation 2002)

Angostura Reservoir is located in the transition zone of the ponderosa pine woodlands of the Black Hills and the mixed-grass prairie of the Northern Plains. Angostura Reservoir is an impoundment of the Cheyenne River, situated at the boundary separating the Hogback and Red Valley physiographic divisions. The river has cut through the Hogback, in what is now the upper end of the reservoir, creating a narrow defile called Jackson Narrows and isolating a segment of the Hogback known as Tepee Mountain. The land to the west of the main body of the reservoir rises steeply toward the crest of the Hogback Ridge. The terrain is rugged and is deeply dissected by numerous intermittent drainages. At the lower end of the reservoir, the river valley passes through a second narrows known as Angostura; here the valley walls are made up of rock of the Lakota and Fall River formations. Along the eastern side of the reservoir, the Black Hills uplift is evident by narrow north-south bands of exposed sediments. Horsehead Creek enters the

reservoir from the southeast, creating gullies and intermittent drainages along the south side of the creek valley.

Recreational Opportunities

While Angostura's primary function is to impound and deliver a full supply of irrigation water, it also provides water based recreational activities. Current recreational opportunities include a range of primitive to full hook-up camp sites, SDGFP camping cabins, hiking/biking trail, boating, 9-hole disc golf course, fishing, game equipment checkout, birding, horseshoes, picnic shelters, playgrounds, ski and swimming beaches, sand volleyball, canoeing, and kayaking.

Angostura Recreation Area located on MUs 1 – 14 and 22 – 24 currently offers four campgrounds: Cheyenne and Cascade Campgrounds in the north unit which is accessed off US Highway 18/385 via Angostura Road through the North Entrance; and, Horsehead and Hat Creek Campgrounds in the south unit which is accessed off US Highway 18/385 via FR 1 through the south entrance.

There are 164 RV campsites dispersed throughout the 4 campgrounds: 7 campsites have electricity, water, and sewer, 143 have electricity only, and 14 have no utilities. In addition to the RV campsites, there are 5 tent only campsites and 9 camping cabins.

Angostura Recreation Area has 7 modern comfort stations and 14 vault toilets. There are approximately 200 picnic tables throughout the campgrounds and day use areas, 14 potable water locations, 2 trailer/RV dump stations (1 in the north unit and 1 in the south unit), 6 boat ramps, 2 of which are low water ramps, 1 designated swim beach with comfort station, 1 ski beach and 3 marinas. For a detailed list of all the existing recreational facilities and opportunities, see Alternative A in Table 2.2.

A concessionaire currently provides services to the park with three marina locations offering boat slips, a beach club, six rental lodges with an outdoor pool and a full service floating convenience store. These concession facilities are privately operated under an agreement with the SDGFP Division of Parks and Recreation.

In addition to the developed recreation opportunities in Angostura Recreation Area, there are primitive recreation areas and a game production area on the west and south sides of the reservoir, which provide additional recreation opportunities; such as hunting, birding and primitive camping. The primitive recreation areas have three additional boat ramps, one of which is a low water ramp, and five additional vault toilets. The west side of the reservoir is accessed off SD Highway 71 via Shep's Canyon Road and the south side is accessed off either US Highway 18/385 via FR79 and US Highway 18/385 or SD Highway 71 via FR 6.

There is approximately 13 miles of road at Angostura Reservoir, most of which are paved within Angostura Recreation Area, while the roads on the west and south sides of the reservoir are unimproved or gravel surfaced.

Angostura Reservoir provides an economic stimulus through both direct spending for recreational services and indirect spending for services to support those activities. Historically the level of revenue has been directly related to the water levels. During the current drought SDGFP has seen a drop in revenue (SDGFP 2001-2008). Spring rains in 2008 raised the level of the reservoir, which in turn caused an increase in revenue of approximately 25% from the previous year. SDGFP expenditures for operation and maintenance have steadily increased over the years.

Visitation Trends

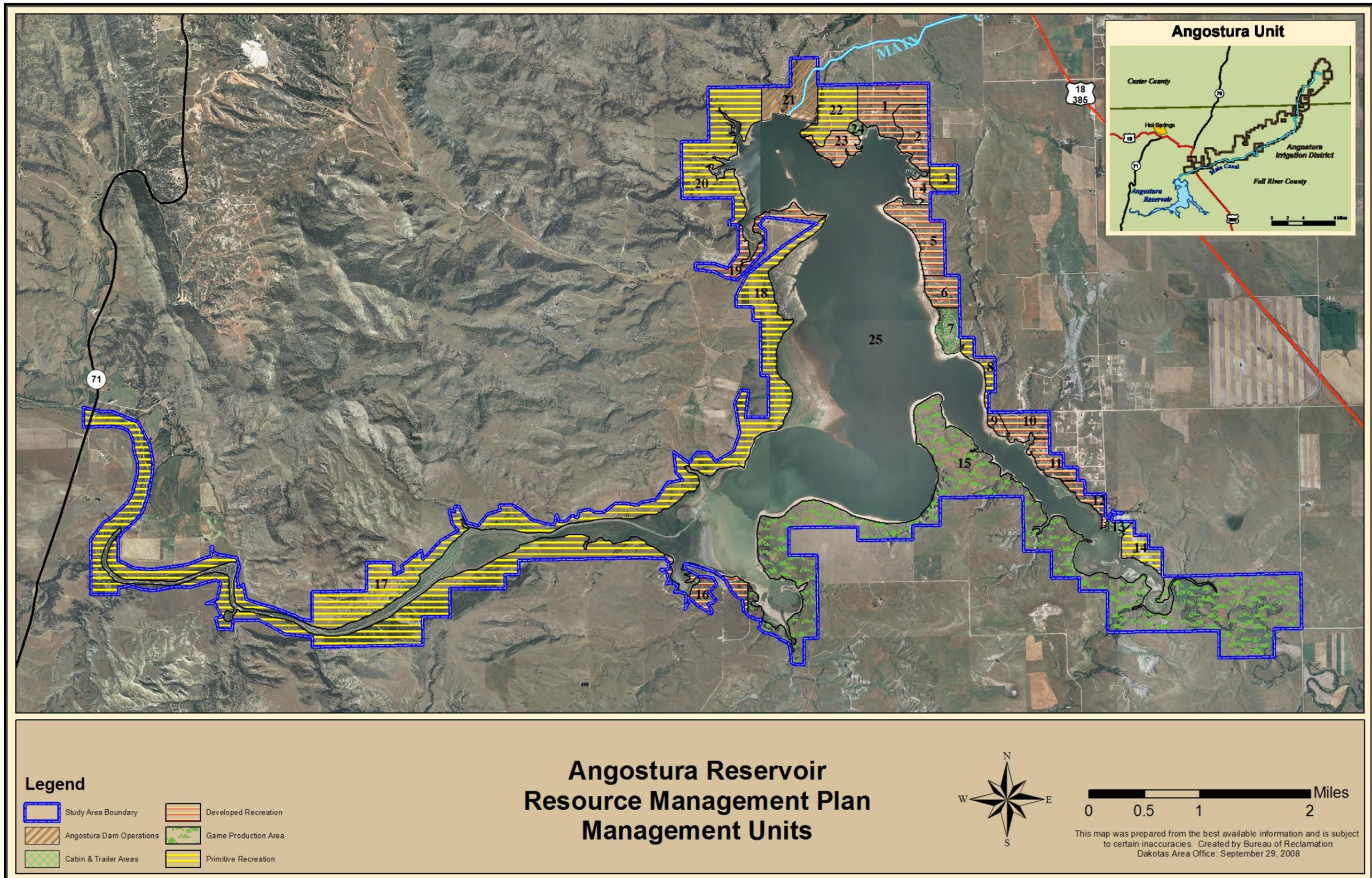
Angostura Reservoir has long been recognized as a major recreational attraction in the southern Black Hills area and is the largest warm-water reservoir in a 100-mile radius. Visitation trends at Angostura Reservoir have been very consistent with an overall increase through the years. During high water periods, visitation at Angostura Reservoir has been consistently over 250,000 per year since the mid 1980's; while persistent low periods brings a significant drop in visitation (SDGFP 1992).

The overall visitation at Angostura Reservoir is expected to continue to increase. An EA completed by South Dakota Department of Transportation and the Federal Highway Administration for the Heartland Expressway, which is the current reconstruction of SD Hwy 79 and US Hwy 18/385 from a 2-lane highway to a 4 lane highway, has projected an increase of over 1400 cars per day traveling past Angostura Road and FR 1 by year 2025. The improved access and increased visibility for Angostura Reservoir is likely to translate into increased visitation.

Along with the improved access, there is significant development occurring adjacent to or near Angostura lands. There are currently seven active developments with open lots directly adjacent to Reclamation land, with several additional developments in the immediate area. The continued population increase of Pennington County, which accounts for approximately 1/3 of the overall users, would also have an affect on visitation.

Traffic data indicates a shift from developed recreation use to more dispersed recreation or primitive recreation opportunities on the west side of Angostura. This is evident as visitation in the Cheyenne River Lake Side Use Area and Shep's Canyon has shown a substantial increase over the last few years. In addition, there has been an increase in the development of primitive land along Shep's Canyon Road and along Hwy 71.

Map 1-1 Resource Management Area



2 Description of Alternatives

This chapter describes the Preferred Alternative developed to meet the purpose and need and the No Action Alternative. The Preferred Alternative prescribes a range of natural, cultural, and recreation resource management actions. A summary comparison of the alternatives is also provided below.

All actions recommended by the public were considered at this time, but some were not included in the Preferred Alternative. The proposed actions not included and the reasons for not including them are listed in Table 2.1.

From the issues, opportunities, goals, and objectives, Reclamation developed the Preferred Alternative and refined it. The Preferred Alternative for each MU is described and shown in Table 2.2. The maps in Appendix B show a general location of proposed management activities in each MU. The public involvement process is fully described in Chapter 4: Public Involvement.

No Action Alternative – Continuation of Existing Management

Under the No Action Alternative, management of the Recreation Area would continue as outlined in existing operating plans, current laws, new or amended regulations, and policy. The 1992 Master Plan would continue to be used for management of the area. In addition to the Master Plan, improvements would be made on an "as needed" basis, or if needed to meet health, safety, American's with Disabilities Act (ADA) or other legal requirements. Current management is summarized in Table 2-2.

Preferred Alternative – Enhanced Developed Recreation & Resource Management

This would be the Preferred Alternative. Under this alternative the current operation and maintenance activities described under the No Action Alternative would continue along with a variety of improvements to visitor use facilities, recreation opportunities, natural resources, including additional recreation developments in MUs 2, 4, 5, 9, 10, 12, and 19. This alternative would limit degradation of natural and cultural resources while developing diverse recreation opportunities consistent with the MU Goals. This alternative is summarized in Table 2-2.

2.1 Proposed Management Actions Considered but Eliminated

Table 2-1 Proposed Management Actions Considered but Eliminated.

Proposed Management Actions Considered but Eliminated			
MU	MU Description	Proposed Management Action	Reason why Actions were Eliminated
1	North Entrance Headquarters	Installation of private docks	This would create new exclusive use and is not consistent with Reclamation Policy.
		Trailer Park	
3	Turkey Draw	Add primitive camping	This area is designated as a day use area; therefore, primitive camping is not consistent with future management direction.
4	Marina/ Concession Area	Extend boat ramp	Boat ramp has been extended to its maximum length. (See Preferred Alternative)
		Theater area	Currently approved and being constructed in Cascade Campground.
5	Picnic Point Day Use Area	Lake access with four wheeler or golf cart	Off Road Vehicle use is limited by federal and state laws and regulations.
		Add water park	Not consistent with the natural surroundings of Angostura land and reservoir.
		Hotel	These management actions are proposed under MU 4.
		Rental Hall	
7	Cabin Area A	Common picnic grounds, playgrounds, and boat launch facilities available to cabin owners and public	These types of facilities are available in adjacent MU's.
8	Angostura Breaks	Primitive camping	This area is designated as a day use area, due to landscape and access limitations; therefore primitive camping is not consistent with future management direction.
9	Hat Creek Campground	Accessible fishing pier	Accessible fishing pier has been added to MU 10.
10	Horsehead Day Use Area	Deepen the bay area	Issue has been resolved with the addition of the new low water boat ramp.
		Move Horsehead boat ramp to the south	This concern for a working boat ramp was addressed by installing a new low water boat ramp.
15	Horsehead Game Production Area	Add parking, boat ramp, boat in camp sites	Not consistent with management restrictions for a game production area and access is limited by adjacent private land.
		Don't allow development, don't add boat ramp, acquire access and develop picnic areas and campground	
16	Bailey's Lakeside Use Area	Courtesy docks	Courtesy dock is available on boat ramp.
17	Cheyenne River Natural Area	Add canoe trips	Canoeing is allowed on navigable waterways.
18	Cheyenne River Lakeside Use Area	Create fee area with appropriate public facilities	Fees would be inconsistent with Lake Side Use Area
		Courtesy docks	Courtesy dock is available on boat ramp.

Proposed Management Actions Considered but Eliminated			
MU	MU Description	Proposed Management Action	Reason why Actions were Eliminated
19	Shep's Canyon Lakeside Use Area	Horse camp	Limited space and resources.
		Allow ATV and golf cart access to reservoir edge	Off Road Vehicle use is limited by federal and state laws and regulations.
23	North Day Use Area	Rental cabins	Not consistent with management direction as a day use area.
24	North Trailer Area	Fishing piers	Already addressed in MU 23.
25	Angostura Reservoir	Set speed limits	This would require a new State law.
		Restrict size of watercraft	
		Create no wake zones near beaches and boat ramps	Existing
		Designate area for personal watercraft	Limited space.
		During low water periods more buoys should be added where there are danger areas	This would create a false sense of safety because it is impossible to mark all water hazards.
		Need access to beaches that are only accessible by boat	Access is limited by adjacent private land.

2.2 Actions Common to All Alternatives

Although the No Action and Preferred Alternatives are different, there are proposed actions that are common to both alternatives.

Operation and maintenance of Reclamation lands and facilities would continue throughout all the alternatives in accordance with project purposes and federal, state, and county laws and regulations and health and safety requirements. This may include repair, replacement, or removal, in addition to routine operation and maintenance activities. The following is a list of facilities and resources where operation and maintenance activities would occur.

1. Utilities.
 - Electricity: above and below ground.
 - Water: wells, cisterns and rural water.
 - sewer: vaults, holding tanks, septic fields, boat pump out and centralized system
 - Telephone: park operations, public and private.
 - Liquid propane: public use and private facilities.
2. Buildings, structures and public use facilities.
 - Headquarters: operations shop, fuel station, storage buildings, cold storage, residence, and welcome/entrance centers.
 - Campgrounds, Day Use Facilities and Lake Side Use Areas: comfort stations, single and double vault toilets, camping cabins, picnic shelters, kiosks, interpretive sites, employee housing, campsites, playground systems, dump stations, fish cleaning stations, picnic tables, benches, fire rings, boat ramps with docks, disc golf course, volleyball courts.

- Marina/Concession Area: concession office/residence, lodging and associated facilities such as sidewalks, patios, lawn care, storage buildings, swimming pool, convenience store, food, boat fuel station, tire and dock breakwaters, boat slips and docking systems, public use compressed air and beach recreation activities.
3. Operation and maintenance activities in the cabin and trailer areas would be in accordance with the respective permit.
 4. Roads, parking areas, non-motorized trails and sidewalks would be maintained or improved with the appropriate surface to provide adequate access throughout Reclamation lands around Angostura Reservoir.
 - Surfaces to be maintained include; natural, gravel, asphalt and concrete.
 - Other features include, but are not limited to, parking barriers, barrier posts, curbs, curb ramps, associated drainage features (such as, culverts, ditches, and slopes), and traffic counters.
 5. Signing and safety devices would be maintained for directional and regulatory information along roads and trails and at facilities and boundaries.
 6. Vegetation
 - Vegetation is maintained for the appropriate uses within the MUs.
 - Mowing, trimming, and planting of ground vegetation, trees, and shrubs occur as appropriate to achieve MU objectives.
 - Irrigation from rural water system, wells, and reservoir through above and below ground sprinkler systems utilized to maintain vegetation and plantings where appropriate as well as to reduce the risk of fire spread.
 - Shorelines are mechanically groomed to enhance public use at beach areas, day use areas and campgrounds.
 - Permits are issued for rotational grazing in order to enhance or restore native wildlife habitat and to manage fire related fuels.
 - Annual plantings of grain crops are managed by agriculture contracts to increase forage for desired wildlife.
 - Trees and shrubs are planted and replaced for shade and decorative purposes, as well as shelter belts and public use screenings.
 - Invasive and undesirable species are managed by use of chemical applications, biological agents, and mechanical control in accordance with DKAO Integrated Pest Management Plan (IPM).
 - Native habitat restoration and dead or hazardous material removal would be managed by use of prescribed burning practices.
 7. Shoreline erosion strategies are utilized to preserve resources; this includes the use of rip-rap and hard point breakwaters.
 8. Fences and gates are constructed, maintained, and removed on an annual basis to maintain boundaries of properties, grazing allotments, or restricted use areas.
 9. SDGFP manages Angostura Reservoir for public recreation, wildlife, and fisheries. This includes; “NO WAKE ZONES”, “SWIMMING ZONES” and “BOAT RESTRICTED” areas, improvement of fish habitat and structure for balanced fish quality and quantity, creel surveys, hazard removal, monitoring of water quality and maintenance, or installation of proper navigation and lighting associated with manmade structures.

10. Law Enforcement is provided by SDGFP to promote public safety, provide emergency response, and perform public notification practices in accordance with State of South Dakota Codified Law (SDCL) and Game, Fish & Parks Commission Regulation (ARSD).

2.3 Environmental Commitments

The following environmental commitments would be included in the RMP and followed when implementing the selected alternative.

National Environmental Policy Act Compliance

Management actions proposed in the future that are determined by Reclamation to go beyond the scope of the analysis described in Chapter 3 would be evaluated for additional NEPA analysis.

Soils

A review and determination of soil suitability for proposed management actions shall be conducted prior to construction.

Water Quality

Management actions which are proposed within wetlands or waters of the U.S., including those identified in Map 3-2 NWI map of Angostura lands would be conducted in compliance with Section 404 of the Clean Water Act and Executive Order 11990.

Natural Resources

Noxious weed and pest control will occur in accordance with the Dakotas Area Office Integrated Pest Management Plan and federal, state and local regulations.

Dead trees, with the exception of trees which are removed to meet recreation or resource management objectives, will be allowed to deteriorate and/or will be replaced with native tree species common to the Angostura Reservoir area with special attention to the use of woody trees and shrubs, such as those listed in Table 3-3 in Chapter 3, and using expertise available from the National Resource Conservation Service.

Planning for tree plantings will include consideration of the goals and objectives for the MU and of the appropriateness of the tree species and planting design for the site, as well as protection and, or restoration of native prairie.

Any areas, which pose a hazard to wildlife as a result of construction or development activities, will be adequately protected (e.g. fenced, netted) to prevent wildlife access.

In accordance with Reclamation's Great Plains Regional policy, all new or replacement utility lines will be buried. If an exception to this is granted by Reclamation, lines and/or towers will be

designed and located to avoid migratory bird collisions and/or electrocutions pursuant to Avian Power Line Interaction Committee protocol (2005 and 2006) and the U. S. Fish and Wildlife Service's Interim Guidelines for Communications Tower Siting, Construction, Operation, and Decommissioning (2000). Expanded protection for above-ground power lines will include a number of measures. There will be a provision of greater than 90-inch spacing between conductors or grounding features. Exposed conducting features will be appropriately insulated. Anti-perching devices will be required as appropriate. Steel pole use will be avoided, where practical. Line aviation markers will be used where power lines are adjacent to wetlands or where wetlands are crossed, native prairie, and migratory bird feeding areas.

State and Federally Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats

Proposed management actions will be evaluated by SDGFP and Reclamation to determine any potential effects. Reclamation has determined that implementation of the Proposed Action will not impact State and Federally Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats. To ensure that no impacts occur as management actions are planned and implemented Reclamation and SDGFP will undertake the following steps:

- Update evaluations of populations or habitat for State and Federally listed species
- Update evaluations of populations or habitats for Species of Special Concern
- Update evaluations of migratory bird use of the project area
- Update evaluations of native prairie including sand sagebrush/prairie sandreed shrubland
- Update evaluations of riparian habitat

These ongoing evaluations would include a determination if the species or habitat exists in the Project Area; the potential impacts to the species or habitat; and determine steps to avoid, minimize, or mitigate the impact in accordance with the goals and objectives for the RMP and all state and federal laws.

If any threatened or endangered species are encountered during construction or development activities, Reclamation would initiate consultation with the U.S. Fish and Wildlife Service to determine appropriate steps to avoid any effects to these species, including stopping new development activities.

If any State Protected Species, Species of Special Concern, Migratory Birds, and Special Habitats are encountered during construction or development activities, Reclamation will consult with SDGFP to comply with state laws.

Cultural Resources

Reclamation will conduct all activities necessary to comply with Section 106 of the NHPA for all actions associated with the selected alternative. The preferred management treatment for historic properties will be to avoid adverse effects during the implementation of activities in undertaking areas as defined in [36 CFR 800.5(c)(2)]. Reclamation shall comply with 36 CFR

Part 800.4(c) to evaluate the historic significance of previously unevaluated cultural resource sites in undertaking areas if they cannot be avoided.

If during the course of any activities associated with the undertaking, any districts, sites, buildings, structures, or objects are discovered, activities will cease in the vicinity of the resource, and the stipulations of 36 CFR Part 800.13 will be satisfied before activities in the vicinity of the previously unidentified property can resume.

Paleontology

There are known paleontological resources in Cretaceous formations in portions of MUs 2, 4, 7, 12, 13, 14, 15, and 17. Management activities proposed in these MUs involving the disturbance of Cretaceous bedrock has the potential to expose and/or damage significant resources. Reviews will be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys/collection/excavation may be conducted to mitigate loss.

Cretaceous formations in portions of MUs 1, 5, 6, 7, 8, 9, 10, 14, 16, 20, 21, 22, 23, and 24 have a high potential to contain significant fossils. Management activities proposed in these MUs involving the disturbance of Cretaceous bedrock have the potential to expose and/or damage significant resources. Reviews will be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys, collection, or excavation may be conducted to mitigate loss.

Quaternary formations in portions of MUs 3, 4, 5, 11, 12, 13, 14, 15, 17, 18, 19, 20, and 21 have low potential for fossil occurrences. Management activities proposed in these MUs involving the disturbance of Quaternary formations have minor potential to expose and/or damage significant paleontological resources. Reviews shall be conducted prior to implementation of proposed management activities involving bedrock rock excavation in these MUs. Surveys, collection, or excavation may be conducted to mitigate loss.

Table 2-2 Alternatives

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center">No Action Alternative</p> <p>Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis. Below is a list of existing facilities and activities as of January 27, 2009.</p>	<p align="center">Preferred Alternative Enhanced Developed Recreation and Resource Management</p> <p>Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
1	North Entrance Headquarters	Operations	<p>Operate and maintain Angostura Parks and Recreation areas consistent with the following objectives:</p> <p>Land Use Management 1.1,1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9,1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Shop facility - 3 Cold storage facilities - Portable water - Fuel system and fuel storage tanks - Chemical storage and flammable material storage - New and used petroleum material storage - Repeater for maintaining Park radio communications - Annual wildlife forage plantings - Irrigation and landscaping at HQ - Burn pile area - Borrow pit - Residence and 1 out building - Well - Utilities - Accessible features - Trash containers 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Install fish cleaning station with grinders -Extend bike/hiking trail - Expand drip irrigation - Add dry storage - Realign north entrance road <p align="center">Second Priority</p> <p align="center">No Proposed Actions</p>
2	Cheyenne Campground	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p>Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Accessible features - 3 Camping cabins - 8 Electrical camping sites - 14 Camping sites W/O electricity - 3 Full hookup sites - 1 Comfort station - 1 Trash container - Dump station - Potable water - Playground equipment - Irrigation pump house - 2 Double and 2 single vault toilets - Utilities 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Add SDGFP camping cabins - Install modern restroom facility for camper cabins - Extend bike/hiking trail - Add shelter belts and drip irrigation <p align="center">Second Priority</p> <ul style="list-style-type: none"> - Expand campground - Add group camping sites

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center">No Action Alternative</p> <p>Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center">Preferred Alternative</p> <p align="center">Enhanced Developed Recreation and Resource Management</p> <p>Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
3	Turkey Draw	Multiple Use	<p>Provide minimum recreation opportunities while protecting, conserving, restoring and enhancing wildlife habitat consistent with the following objectives;</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- Vegetation/wildlife habitat management</p>	<p align="center">First Priority</p> <p align="center">- Add archery trail</p> <p align="center">Second Priority</p> <p align="center">No Proposed Actions</p>
4	Marina Concession Area	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives;</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Marina with hard point and riprap areas, reflective break water system, 97 rental boat slips and dock system, 6 boat lifts, 6 personal watercraft lifts, septic pump out for boats, and a convenience store with fuel system and fuel storage tanks. - 6 rental lodges with outdoor swimming pool - 1 Residence/concession office with storage shed - Irrigation systems for residence, rental lodges and ski beach area <ul style="list-style-type: none"> - Central sewer system - 1 modern comfort station and 1 double vault toilet - Ski beach with groomed shoreline, snack shack food service, Hobie Cat storage area and 2 sand volleyball courts <ul style="list-style-type: none"> - Bike/hiking trail - 1 pay phone - Trash container - Potable water - Utilities 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Expand, improve, or replace facilities offered by the concessionaire (this would include: store, showers, online weather station, restaurant, laundromat, enclosed rental hall with an outdoor deck for weddings, meetings, etc.) <ul style="list-style-type: none"> - Add (secured) dry storage - Extend bike/hiking Trail - Add boat rental slips/mooring - Redesign tire break water and extend hard point <ul style="list-style-type: none"> - Add accessible shore fishing piers - Improve boat sewage pump out station <ul style="list-style-type: none"> - Add rental lodges - Supply power to the Marina slips - Add shelter belts and drip irrigation - Add courtesy docks - Improve lighting <p align="center">Second Priority</p> <ul style="list-style-type: none"> - Add low water boat ramp to the hard point extension project.

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center">No Action Alternative Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center">Preferred Alternative Enhanced Developed Recreation and Resource Management Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
5	Picnic Point Day Use Area	Developed Recreation	<p>Provide adequate recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - 2 Picnic Shelters - Sheltered benches - Swimming beach with groomed shoreline - 1 Modern comfort station and 2 vault toilets - Bike/hiking trail - Interpretive displays - Trash containers - Potable water - Utilities - Well 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - No Proposed Actions <p align="center">Second Priority</p> <ul style="list-style-type: none"> -Add Hobie Cat storage
6	Cascade Campground	Developed Recreation	<p>Provide developed recreational facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> -2 Camping cabins, 2 full hookup camp sites, and 63 camp sites with electrical hookup only - 2 Modern comfort stations and a vault toilet - Playground equipment - Trash containers - Amphitheater - Potable water - Central sewer system and sewer lagoons - Well - Groomed shoreline - Utilities 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Expand camping - Add SDGFP camping cabins - Add shelter belts and drip irrigation - Use existing well for irrigation - Extend bike/hiking trail <p align="center">Second Priority</p> <ul style="list-style-type: none"> - No Proposed Actions

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center">No Action Alternative</p> <p>Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center">Preferred Alternative</p> <p align="center">Enhanced Developed Recreation and Resource Management</p> <p>Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
7	Cabin Area A	Cabin and Trailer Areas	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives;</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - 32 Seasonal cabin site permits - Groomed shoreline with Hobie Cat beach - Utilities - Individual wells and septic systems - Trash containers - Bike/hiking trail 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Retain and maintain cabin area - Develop new cabin permit that allows improvements and outlines the policies, rules, regulations, and permitted activities. - Require sewer systems to be upgraded to meet South Dakota Department of Environment and Natural Resources Standards. If not possible associated sites would be vacated. - Extend bike/hiking trail - Upgrade potable water systems - Rental cabins <p align="center">Second Priority</p> <ul style="list-style-type: none"> - No Proposed Actions
8	Angostura Breaks	Multiple Use	<p>Provide minimum recreation opportunities while protecting, conserving, restoring and enhancing wildlife habitat consistent with the following objectives;</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Bike/hiking trail 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Construct connector road - Stabilize shoreline - Extend bike/hiking trail <p align="center">Second Priority</p> <ul style="list-style-type: none"> - No Proposed Actions

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
9	Hat Creek Campground	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p>- 2 Camping cabins, 1 full hookup camp site, 21 camp sites with electrical only and 5 tent camp sites without utilities</p> <p>- 1 Modern comfort station and 1 vault toilet</p> <ul style="list-style-type: none"> - Utilities - Trash containers - Potable water - Bike/hiking trail - Playground equipment - Groomed shoreline 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> -Add SDGFP camping cabins -Extend bike/hiking trail -Add shelter belts and drip irrigation - Stabilize shoreline <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions
10	Horsehead Day Use Area	Developed Recreation	<p>Provide adequate recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Picnic shelter - Trash container - Sand volleyball court - Boat ramp - Low water boat ramp - Boat dock - Fish cleaning station - Vault toilet - Potable water - Utilities - Fishing pier 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Add courtesy docks - Add amphitheater - Extend bike/hiking trail - Add shelter belts and drip irrigation <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - Add concession, bait shop, boat slips, and gas services

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
11	Horsehead Campground	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - 2 Camping cabins, 1 full hookup camp site, 51 camp sites with electrical only - 1 Modern comfort station and 2 double vault toilets - Trash containers - Waste disposal and dump station - Playground equipment - Potable water - Utilities - 2 Wells 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Add SDGFP camping cabins - Expand campground - Add shelter belts and drip irrigation - Add comfort station to support additional camp sites - Extend bike/hiking trail <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions
12	South Entrance Day Use Area	Developed Recreation	<p>Provide adequate recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5</p> <p align="center">Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p align="center">Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p align="center">Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Information/entrance station - Marina with boat ramp, slips, and dock - Utilities - Vault toilet - Trash container 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Deepen and widen the present slip area to accommodate for low water access, more slips, and additional courtesy docks. - Extend bike/hiking trail - Add disk golf course - Add swimming beach - Add accessible fishing access - Install water and sewer to South Entrance Station <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - Move boat ramp to the south end of the point into deeper water and to relieve congestion around ramp and slips

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.	<u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.
13	South Trailer Area	Cabin & Trailer Areas	Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives: Land Use Management 1.2, 1.3, 1.4, 1.5 Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13 Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12 Cultural Resource Management 1.1, 1.2, 1.3, 1.4	<ul style="list-style-type: none"> - 55 Trailers - Individual septic systems - Potable water - Utilities 	<p style="text-align: center;"><u>First Priority</u></p> <ul style="list-style-type: none"> - Develop new trailer permit that allows improvements and outlines the policies, rules, regulations, and permitted activities. - Require sewer systems to be upgraded to meet South Dakota Department of Environment and Natural Resources Standards. If not feasible associated sites would be vacated. <ul style="list-style-type: none"> - Redesign the trailer area - Extend bike/hiking trail - Retain and maintain trailer area - Upgrade potable water delivery system. <p style="text-align: center;"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions
14	Shale Banks Day Use Area	Multiple Use	Provide minimum recreation opportunities while protecting, conserving, restoring and enhancing wildlife habitat consistent with the following objectives: Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5 Natural Resource Management 1.1, 1.2, 1.3, 1.9, 1.10, 1.11, 1.12, 1.13 Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12 Cultural Resource Management 1.1, 1.2, 1.3, 1.4	<ul style="list-style-type: none"> - Dirt road 	<p style="text-align: center;"><u>First Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions <p style="text-align: center;"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
15	Horsehead Game Production Area	Multiple Use	<p>Protect, conserve, restore, and enhance wildlife habitat consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.3, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- Vault toilet</p> <p>- Two track access road in SE corner</p> <p>- Wildlife habitat/agricultural plantings</p> <p align="center">- Vegetation/wildlife habitat management</p>	<p align="center"><u>First Priority</u></p> <p>- Increase enforcement of game production area regulations</p> <p align="center"><u>Second Priority</u></p> <p>- No Proposed Actions</p>
16	Bailey's Lakeside Use Area	Developed Recreation	<p>Provide diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- Primitive camping</p> <p align="center">- Picnic shelter</p> <p align="center">- Vault toilet</p> <p align="center">- Boat ramp and dock</p>	<p align="center"><u>First Priority</u></p> <p>- Remove picnic shelter</p> <p align="center"><u>Second Priority</u></p> <p>- No Proposed Actions</p>
17	Cheyenne River Natural Area	Multiple Use	<p>Protect, conserve, restore, and enhance wildlife habitat and natural resources consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.3, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- Vegetation/wildlife habitat management</p>	<p align="center"><u>First Priority</u></p> <p>- Maintain as walk-in area</p> <p align="center">- Add shelter belts</p> <p align="center"><u>Second Priority</u></p> <p>- No Proposed Actions</p>

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
18	Cheyenne River Lakeside Use Area	Multiple Use	<p>Protect, conserve, restore, and enhance wildlife habitat and natural resources while providing minimum basic facilities to support the demand for diverse recreational opportunities consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Primitive camping - 2 vault toilets - Boat ramp and dock - Angostura Island Estates entrance road - Agricultural land 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Maintain as primitive area - Designate primitive camp sites - Add vault toilets - Shelter belts <ul style="list-style-type: none"> - Realign road and obliterate and reseed unwanted roads. - Improve wildlife habitat <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions
19	Shep's Canyon Lakeside Use Area	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.3, 1.9, 1.8, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.3, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Boat ramp, dock, and parking - Vault toilet - Irrigation point of diversion and delivery system - Angostura Island Estates Trails 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Improve access and upgrade facilities - Add trash containers <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - The public use of this area should be monitored and if the demand continues to increase and the need arises a study should be done to determine feasibility of creating a fee area with appropriate public facilities (actions may include; modification of Shep's Canyon Bay to allow for low water access, add low water boat ramp, add boat slips and courtesy docks, add accessible fishing pier, maintain public beach with groomed shoreline, and a campground with host).
20	Red Canyon	Multiple Use	<p>Protect, conserve, restore, and enhance wildlife habitat and natural resources while providing minimum basic facilities to support the demand for diverse recreational opportunities consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Vegetation/wildlife habitat management 	<p align="center"><u>First Priority</u></p> <ul style="list-style-type: none"> - Designate Pack-in/Pack-out Boat-in or hike-in camp sites <p align="center"><u>Second Priority</u></p> <ul style="list-style-type: none"> - No Proposed Actions

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
21	Angostura Dam	Operations	<p>Impound and deliver a full supply of irrigation water for production of forage and grain crops consistent with the following objectives:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.2, 1.3, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- Restricted area facilities</p>	<p align="center"><u>First Priority</u> - No Proposed Actions</p> <p align="center"><u>Second Priority</u> - No Proposed Actions</p>
22	Mule Deer Ridge	Multiple Use	<p>Protect, conserve, restore, and enhance wildlife habitat and natural resources while providing minimum basic facilities to support the demand for diverse recreational opportunities:</p> <p>Land Use Management 1.1, 1.2, 1.3, 1.4, 1.5</p> <p>Natural Resource Management 1.1, 1.2, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13</p> <p>Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>		<p align="center"><u>First Priority</u> - Extend bike/hiking trail - Remove fence along west edge of MU boundary</p> <p align="center"><u>Second Priority</u> - No Proposed Actions</p>

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center"><u>No Action Alternative</u> Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center"><u>Preferred Alternative</u> <u>Enhanced Developed Recreation and Resource Management</u> Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
23	North Day Use Area	Developed Recreation	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5 Natural Resource Management 1.2, 1.9, 1.10, 1.11, 1.12, 1.13 Recreation Management 1.2, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12 Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p>- Marina with boat ramp, low water boat ramp, dock, boat slips, accessible fishing pier, open storage lot, and fish cleaning station.</p> <p align="center">- Interpretive / information display</p> <p align="center">- Disk golf course</p> <p align="center">- Seasonal employee housing</p> <p align="center">- Utilities</p> <p align="center">- Potable water</p> <p align="center">- Trash container</p> <p align="center">- Vault toilet</p>	<p align="center"><u>First Priority</u></p> <p>- Upgrade marina (actions may include adding boat slips, courtesy docks, mast lift, navigational beacon, and accessible shore fishing access).</p> <p align="center">- Improve seasonal housing</p> <p align="center">- Extend bike/hiking trail</p> <p align="center">- Replace overlook structure</p> <p align="center">- Add dry storage</p> <p align="center">- Add a modern restroom</p> <p align="center"><u>Second Priority</u></p> <p align="center">- No Proposed Actions</p>
24	North Trailer Area	Cabin & Trailer Areas	<p>Provide developed recreation facilities to support the demand for diverse recreational opportunities and a quality experience consistent with the following objectives:</p> <p align="center">Land Use Management 1.2, 1.3, 1.4, 1.5 Natural Resource Management 1.8, 1.9, 1.10, 1.11, 1.12, 1.13 Recreation Management 1.1, 1.5, 1.6, 1.7, 1.8, 1.9, 1.11, 1.12 Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<p align="center">- 35 trailers</p> <p align="center">- Septic systems</p> <p align="center">- Utilities</p> <p align="center">- Trash container</p> <p align="center">- Wells</p> <p align="center">- Potable water</p>	<p align="center"><u>First Priority</u></p> <p>- Develop new trailer permit that allows improvements and outlines the policies, rules, regulations, and permitted activities.</p> <p>- Require sewer systems to be upgraded to meet South Dakota Department of Environment and Natural Resources Standards. If not feasible associated sites would be vacated.</p> <p align="center">- Haul in sand to improve beach area.</p> <p>- Upgrade facilities and utilities to accommodate potential future use.</p> <p align="center">-Extend bike/hiking trail</p> <p align="center"><u>Second Priority</u></p> <p>- Due to the amount of comments received regarding the redesign of this MU, there is a need to review the possibility of providing improved public use. This may include short term rental units and appropriate facilities, such as, motel, cabins, campsites, etc.</p>

Table 2-2 Alternatives (Continued)

MU Number	MU Description	Existing MU Type	MU Goal(s) and Objectives	<p align="center">No Action Alternative</p> <p>Existing operation and maintenance would continue and would include everything from day to day operation and maintenance to complete removal and/or replacement. A determination of need and compliance for future proposed projects would be handled on an individual basis.</p>	<p align="center">Preferred Alternative</p> <p align="center">Enhanced Developed Recreation and Resource Management</p> <p>Alternative also includes the existing operation and maintenance as listed in the No Action Alternative. Priorities shown are based on current need and would need to be reassessed periodically.</p>
25	Angostura Reservoir	Multiple Use	<p>Manage diverse recreation opportunities on Angostura Reservoir while protecting and enhancing the water quality and fisheries habitat consistent with the following objectives:</p> <p>Natural Resource Management 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.10, 1.11</p> <p>Recreation Management 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11</p> <p>Cultural Resource Management 1.1, 1.2, 1.3, 1.4</p>	<ul style="list-style-type: none"> - Fishery management practices (habitat structures) - Restricted Area in front of dam <ul style="list-style-type: none"> - No Wake Zones - Swim Area Zone 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Improve fish habitat - Remove high point of land that runs under the slips at the Marina. - Address sedimentation hazards. <p align="center">Second Priority</p> <ul style="list-style-type: none"> - No Proposed Actions
1-25	Proposed Actions Common to Most Management Units			<ul style="list-style-type: none"> - Roads paved, gravel and dirt - Parking areas <ul style="list-style-type: none"> - Fence - Invasive species control - Trees (shelter, screening and shade) <ul style="list-style-type: none"> - Mow grass - Signage - Law enforcement - Risk management - Landscape plantings - Basic wildlife management actions may include, but are not limited to, grazing, shelterbelts, fire management, weed and pest management, fencing, re-establishment of native vegetation, and forage plantings 	<p align="center">First Priority</p> <ul style="list-style-type: none"> - Continue to improve universal accessible facilities - Upgrade/expand water and sewer systems - Manage beach and reservoir access - Manage uplands and riparian areas for wildlife production - Pursue recreational activities which may include the use of adjacent lands. - Provide educational/interpretive opportunities <ul style="list-style-type: none"> - Determine occupancy loads - Increase Law Enforcement presence on west side and reservoir - Improve shore fishing and access - Review and address shoreline erosion / stabilization needs - Allow for expansion of concession services and supply necessary utilities - Increase size of camp pads due to increased size in RVs <ul style="list-style-type: none"> -Extend bike/hiking trail <p align="center">Second Priority</p> <ul style="list-style-type: none"> - No Proposed Actions

2.4 Resource and Impacts Summary

A summary of existing conditions and impacts from alternatives are listed for each MU in Table 2-3. There were no impacts to Indian Trust Assets and Environmental Justice and therefore were not included in the table.

Table 2-3 Resource and Impacts Summary Matrix

	MU 1, 6, 8, 9, 10, 16, 22, 23, 24,	MU 2	MU 3, 11, 18, 19,	MU 4, 12, 13, 15, 17,	MU 5, 20, 21,	MU 7	MU 14	MU 25
Paleontology	Description Cretaceous formation with high potential for fossil occurrences	Description Cretaceous formation with known fossil occurrences	Description Quaternary formations with low potential for fossil occurrences.	Description Quaternary formations with low potential for fossil occurrences. Cretaceous formations with known fossil occurrences.	Description Quaternary formations with low potential for fossil occurrences. Cretaceous formation with high potential for fossil occurrences.	Description Cretaceous formation with high potential for fossil occurrences Cretaceous formation with known fossil occurrences	Description Quaternary formations with low potential for fossil occurrences. Cretaceous formation with high potential for fossil occurrences. Cretaceous formation with known fossil occurrences.	Description Not Evaluated
	Impacts – All MUs							
	<u>No Action Alternative</u> - Minimal without implementation of RMP <u>Preferred Alternative</u> - There would be no impacts to paleontological resources with environmental commitments in place.							
Soils	MU 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25	MU 2	MU 3					
	Description Soils-Suitable for development. Erosion- Minimal potential Topography- Minimal limitations	Description Soils-Suitable with modification for development. Erosion- Moderate potential Topography- Moderate limitations	Description Soils-Suitable with modification for development. Erosion- Moderate potential Topography- Minimal limitations					
	Impacts- All MUs <u>No Action Alternative</u> - Minimal without implementation of RMP <u>Preferred Alternative</u> - There would be no significant impacts to soil resources as soil characteristics will be taken into account during planning.							
Water Quality	Description- See Chapter 3 Impacts- Not assessed by MU. Under the No Action Alternative there would be no negative impact from recreation and land management, and a positive impact from waste disposal systems and upland management. The impacts under the Preferred Alternative would be the same as for the No Action Alternative, with the addition of an overall positive impact from the removal of boating hazards resulting from sediment accumulation.							

Table 2-3 Resource and Impacts Summary Matrix (Continued)

	MU 1, 11	MU 2	MU 3	MU 4	MU 5	MU 6	MU 7
Veg/Fish & Wildlife	Description Rangeland- Not measured Wetlands- < 1 acre, freshwater emergent Natural Communities- None Riparian- None Fish & Wildlife Habitat- Moderate Potential	Description Rangeland- Not measured Wetlands- < 1 acre, freshwater emergent Natural Communities-None Riparian- None Fish & Wildlife Habitat- Moderate Potential	Description Rangeland- Not measured Wetlands- none Natural Communities-None Riparian- None Fish & Wildlife Habitat- Moderate Potential	Description Rangeland- Not measured Wetlands- <1 acre lake Natural Communities-None Riparian- None Fish & Wildlife Habitat- Minimal Potential	Description Rangeland- Not measured Wetlands- 4 acres, freshwater emergent, lake, and forested/scrub-shrub Natural Communities-None Riparian- None Fish & Wildlife Habitat- Moderate Potential	Description Rangeland- Not measured Wetlands- 1 freshwater emergent, and forested/scrub-shrub Natural Communities-None Riparian- None Fish & Wildlife Habitat- Moderate Potential	Description Rangeland- Not measured Wetlands- 1 freshwater emergent Natural Communities-None Riparian- None Fish & Wildlife Habitat- Minimal Potential
	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.	Impacts <u>No Action Alternative</u> Rangeland- No impacts <u>Preferred Alternative</u> Rangeland- No impacts	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects. Wetlands- No impacts with environmental commitments in place.

Table 2-3 Resource and Impacts Summary Matrix (Continued)

	MU 8	MU 9	MU 10	MU 12	MU 13, MU 14	MU 15	MU 16
	<p>Description Rangeland - Not measured Wetlands- 1 freshwater emergent Natural Communities- None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Remnant native grassland community is highly disturbed Wetlands - <1 acre -scrub-shrub, freshwater pond Natural Communities- Sandsage/sandreed shrubland community Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Not measured Wetlands - none Natural Communities - None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Not measured Wetlands - < 1 acre, freshwater pond Natural Communities - None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Not measured Wetlands - none Natural Communities - None Riparian- None Fish & Wildlife Habitat - Minimal Potential</p>	<p>Description Rangeland - Poor (southeast corner) due to an abundance of introduced grasses and weedy forbs: planting to crested wheatgrass, and past overgrazing, now fenced. Wetlands - 47 acres-scrub-shrub, freshwater emergent, lake. Natural Communities- Sandsage/sandreed shrubland community. Riparian - "Sustainable" with fairly high vegetative diversity, recruitment of cottonwood, some degradation due to past management of grazing and recreation currently being helped by fencing. Fish & Wildlife Habitat - High Potential</p>	<p>Description Rangeland - Not measured Wetlands - 7 acres, freshwater emergent Natural Communities- None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>
Veg/Fish & Wildlife	<p>Impacts <u>No Action Alternative</u> Rangeland - No impacts Wetlands - No impacts <u>Preferred Alternative</u> Rangeland - Minor loss of existing vegetation due to proposed projects. Wetlands - No impacts with environmental commitments in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland - No impacts Wetlands - No impacts Natural Communities- May be impacted <u>Preferred Alternative</u> Rangeland - Minor loss of existing vegetation due to proposed projects. Wetlands - No impacts with environmental commitments in place. Natural Communities - Not likely to be impacted with RMP land use and natural resource objectives in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland - No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland - Minor loss of existing vegetation due to proposed projects. Wetlands - No impacts with environmental commitments in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland - No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland - Minor loss of existing vegetation due to proposed projects. Wetlands - No impacts with environmental commitments in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts <u>Preferred Alternative</u> Rangeland- No impacts</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- Some improvement may occur. Wetlands- Some improvement may occur. Natural Communities- May be impacted Riparian- Some improvement may occur. <u>Preferred Alternative</u> Rangeland- Improvement more likely to occur with RMP land use and natural resource objectives in place. Wetlands- Improvement more likely with RMP land use and natural resource objectives in place. Natural Communities - Not likely to be impacted with RMP land use and natural resource objectives in place. Riparian- Improvement more likely to occur with RMP land use and natural resource objectives in place.</p>	<p>Impacts <u>No Action Alternative</u> No impact <u>Preferred Alternative</u> Rangeland - No impact with environmental commitments in place. Wetlands- No impact with environmental commitments in place.</p>

Table 2-3 Resource and Impacts Summary Matrix (Continued)

	MU 17	MU 18	MU 19	MU 20	MU 21	MU 22	MU 23
Veg/Fish & Wildlife	<p>Description Rangeland- Poor due to high disturbance from past agricultural practices, unregulated grazing operations, and abundance of cheatgrass and near total loss of native vegetation. Wetlands- 419 acres- lake, scrub-shrub, forested, riverine, freshwater emergent, Natural Communities-None Riparian- "Functioning at risk" with high vegetation diversity but high in undesirable weedy species to "not sustainable" due to frequent livestock, lack of vegetation, native vegetation virtually non-existent, and eroding river banks. Fish & Wildlife Habitat-High Potential</p>	<p>Description Rangeland- Not measured Wetlands- 82 acres - lake, forested, scrub-shrub, freshwater emergent Natural Communities-None Riparian-None Fish & Wildlife Habitat High Potential</p>	<p>Description Rangeland - Not measured Wetlands - 4 - scrub-shrub, freshwater emergent, pond, forested Natural Communities -None Riparian - None Fish & Wildlife Habitat - Minimal Potential</p>	<p>Description Rangeland - Poor condition due to long term cattle grazing, prairie dog grazing. Has mix of native and introduced grasses and forbs. Wetlands - None Natural Communities - None Riparian - None Fish & Wildlife Habitat - High Potential</p>	<p>Description Rangeland - Not measured Wetlands - 17 acres - riverine, freshwater emergent Natural Communities - Not Evaluated Riparian - Not Evaluated Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Poor condition due to high diversity of introduced species and decrease in native vegetation Wetlands - None Natural Communities - None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>	<p>Description Rangeland - Not measured Wetlands - None Natural Communities - None Riparian - None Fish & Wildlife Habitat - Moderate Potential</p>
	<p>Impacts <u>No Action Alternative</u> Rangeland- Some improvement may occur. Wetlands- Some improvement may occur. Riparian-Some improvement may occur. <u>Preferred Alternative</u> Rangeland- Improvement more likely to occur with RMP land use and natural resource objectives in place. Wetlands- Improvement more likely to occur with RMP land use and natural resource objectives in place. Riparian- Improvement more likely to occur with RMP land use and natural resource objectives in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Improvement may occur with land use and natural resource RMP objectives in place Wetlands- No impacts with environmental commitments in place</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects Wetlands-No impacts with environmental commitments in place</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts <u>Preferred Alternative</u> Rangeland No impacts with environmental commitments in place</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts Riparian- Not evaluated <u>Preferred Alternative</u> Rangeland- No impacts with environmental commitments in place Wetlands- No impacts with environmental commitments in place Riparian- Improvement more likely to occur with RMP land use and natural resource objectives in place.</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Improvement may occur with RMP land use and natural resource objectives in place. Wetlands- No impacts with environmental commitments in place</p>	<p>Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects</p>

Table 2-3 Resource and Impacts Summary Matrix (Continued)

Veg/Fish & Wildlife	MU 24	MU 25				
	Description Rangeland- Not measured Wetlands- None Natural Communities-None Riparian- None Fish & Wildlife Habitat- Minimal Potential	Rangeland- Not measured Wetlands- 4221 acres - lake Natural Communities-None Riparian- None Fish & Wildlife Habitat- High Potential				
	Impacts <u>No Action Alternative</u> Rangeland- No impacts <u>Preferred Alternative</u> Rangeland- Minor loss of existing vegetation due to proposed projects	Impacts <u>No Action Alternative</u> Rangeland- No impacts Wetlands- No impacts <u>Preferred Alternative</u> Rangeland- No impacts with environmental commitments in place Wetlands- Improvement more likely to occur with RMP land use and natural resource objectives in place.				
T&E	MU 9	MU 18	MU 22	All Other MU		
	Description High plains tiger beetle - Species of Special Concern	Description Bald Eagle- South Dakota State Threatened Spiny softshell turtle- Species of Special Concern	Description Common merganser- Species of Special Concern (record on reservoir in this unit)	Description None		
	Impacts <u>No Action Alternative</u> May be impacts <u>Preferred Alternative</u> - Not likely to be impacted with RMP land use and natural resource objectives in place.	Impacts <u>No Action Alternative</u> May be impacts <u>Preferred Alternative</u> - Not likely to be impacted with RMP land use and natural resource objectives in place.	Impacts <u>No Action Alternative</u> May be impacts <u>Preferred Alternative</u> Not likely to be impacted with RMP land use and natural resource objectives in place.	Impacts No Impact		
Cultural Resources	MU 1, 2, 3, 8, 9, 10, 13, 16, 18, 23, 24,	MU 4, 5, 6, 7,	MU 11, 17, 19, 22	MU 12, 14,	MU 15, 20, 25	MU 21
	Description Non-NRHP eligible sites	Description No Cultural Resource sites	Description Non-NRHP eligible sites NRHP eligible/listed sites	Description Non-NRHP eligible sites NRHP eligible/listed sites Unevaluated sites.	Description Non-NRHP eligible sites Unevaluated sites	Description NRHP eligible sites
	Impacts No impacts	Impacts No impacts	Impacts <u>No Action Alternative</u> No impacts <u>Preferred Alternative</u> - No impacts to non-NRHP eligible sites and if other sites are avoided and environmental commitments in place.	Impacts <u>No Action Alternative</u> No impacts <u>Preferred Alternative</u> - No impacts to non-NRHP eligible sites and if other sites are avoided and environmental commitments in place.	Impacts <u>No Action Alternative</u> No impacts <u>Preferred Alternative</u> - No impacts to non-NRHP eligible sites and if other sites are avoided and environmental commitments in place.	Impacts <u>No Action Alternative</u> No impacts <u>Preferred Alternative</u> - No impacts to non-NRHP eligible sites and if other sites are avoided and environmental commitments in place.
Socio-Economic	Description- See Chapter 3 Impacts- Not assessed by MU. Under No Action Alternative there would be no impact. Preferred Alternative would have a positive impact on the economy.					

3 Affected Environment and Environmental Consequences

This chapter discusses the affected environment and evaluates the environmental consequences of proposed alternatives within the Project Area. This chapter is organized by resource topic. Resource topics analyzed in detail include Paleontology, soils, water quality, vegetation, fish and wildlife, threatened, endangered and species of special concern, cultural resources, and socioeconomics. Indian Trust Assets (ITA) are an important consideration for Angostura Reservoir and were fully addressed in the Angostura EIS.

There would be no additional impacts to ITA from the proposed management actions; therefore, they are not addressed further in this EA. Environmental Justice was considered and it was determined that no groups would be unequally affected by the implementation of either the No Action or Preferred Alternative. Climate and air quality are not discussed because early in the scoping and analysis process, no issues were identified regarding potential effects to these resources.

For each resource topic, the affected environment is addressed first and describes the current conditions for each resource within Reclamation lands.

What is the Affected Environment and Environmental Consequences?

Affected Environment describes the current condition of the resource.

Environmental Consequences describes how the alternatives would change the condition of the resource.

3.1 Paleontology

Affected Environment

The geology of the reservoir is dominated by sedimentary deposits developed in a shallow sea that extended from the Gulf of Mexico to the Arctic Ocean 144 million years to 65 million years ago during the Cretaceous Period. They consist of Greenhorn Limestone, Carlile Shale, the Niobrara formation, and the Pierre Shale formation. Pierre Shale is the dominant geologic Formation over the majority of Angostura Reservoir.

The fossil remains of plants and animals are known as paleontological resources. Most of the paleontological resources at Angostura Reservoir are found in rock formed during the Cretaceous Period.

The first paleontological surveys, at what is now Angostura Reservoir, occurred in the 1940s prior to the construction of Angostura Dam. They were conducted by the Smithsonian Institute River Basin Survey (SI-RBS) (Bauxar 1947). Reclamation has conducted periodic surveys and excavations with the assistance of the Museum of Geology at the South Dakota School of Mines

and Technology (Museum of Geology). The Museum of Geology has prepared an assessment of the potential of geological formations in the area to contain paleontological resources (Bell 1995), which has been useful for planning surveys and management activities for paleontological resources.

The focus of paleontological fieldwork at Angostura Reservoir has been upon Cretaceous formations such as Newcastle Sandstone, Skull Creek Shale, Belle Fourche Shale, the Gammon Ferruginous, Shannon Springs, and Mitten Black Formations of the Pierre Shale Group. The oldest site was discovered in the Newcastle Sandstone, which appears as channels incised into the Skull Creek Shale. The fossil consisted of sharks teeth and fish (osteichthyan). In 1994, fossilized remains of a marine reptile, called a mosasaur (*Platecarpus* sp.), were discovered eroding out of the Sharon Springs Member of the Pierre Shale at the southern end of the reservoir. (Bell 1995a).

In 1995, the Museum of Geology conducted surveys that resulted in the identification of 12 paleontological sites. This includes the remains of clams, oysters, fish, turtles, birds, and mosasaurs. In 1996, the Museum of Geology excavated the remains of another type of marine reptile, called a Plesiosaur that included a well preserved skull. The Plesiosaur is one of less than a half-dozen reported specimens with cranial material (Bell 1997).



Figure 2 Excavation of a Plesiosaur in 2005 at Angostura Reservoir. The site is known as the Puckett Site, named after its discoverers.

In 2005, a neighboring land owner reported the discovery of a Plesiosaur vertebrate in a box canyon on Reclamation lands. The remains were excavated by the Museum of Geology and displayed at the Journey Museum in Rapid City, South Dakota.

In 2007, the Museum of Geology conducted surveys of lands below the 3187 feet elevation mark and revisited all previously recorded sites at Angostura Reservoir. The survey areas were expanded upon to include coverage of the Pierre Shale zone, which is the most fossiliferous rock unit represented at Angostura Reservoir. The survey resulted in the discovery of 12 new sites. They consist of bi-valves, shark teeth, bird, a mosasaur, and parts of a plesiosaur and a mosasaur.

The shoreline area around the reservoir, gullies, and lands along the Cheyenne River and its tributaries are prone to erosion. The exposure of new sites can be anticipated as fossil bearing rock is exposed.

Environmental Consequences

Paleontological sites were identified based on surveys conducted in 1995 and 2007 by the Museum of Geology. The sites are located in areas susceptible to erosion and a changing

landscape which leads to exposure. Geologic formations in each MU were assessed for their potential to contain fossils, see Table 2-3. See Section 2.3, Environmental Commitments, for a description of environmental consequences in each MU.

3.2 Soils

Affected Environment

The information in this section is summarized from the *Soil Survey of Fall River County South Dakota* prepared by the USDA, Soil Conservation Service (SCS) (1982). This soil survey has identified 24 different soil series at Angostura Reservoir.

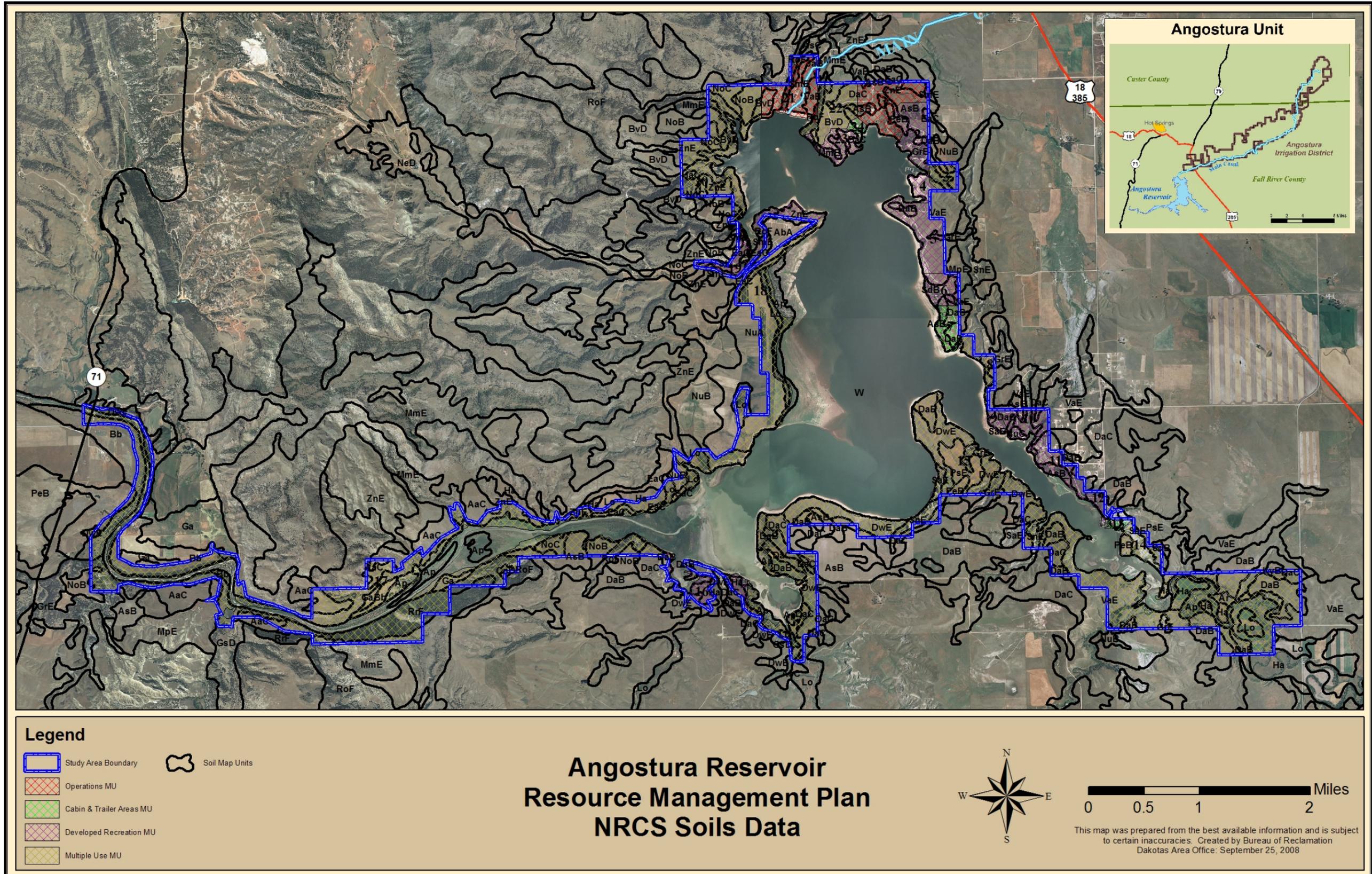
Many of the soils in Fall River County, where Angostura Reservoir is located, were formed in a residue of clayey shale, silty shale, sandstone, siltstone and limestone. Soil formation is greatly influenced by topographic relief and deposition. There is an increased susceptibility of erosion of soils overlaying impenetrable bedrock formations, such as shale. This frequently occurs in areas with varying topographic relief.

The most relevant soil characteristics for the purpose of land management planning at Angostura Reservoir are considered to be soil, depth and drainage characteristics. Soil depth and drainage characteristics influence vegetative growth and management, as well as suitability for the construction of facilities associated with recreation development. The SCS defines soil depth by the thickness of weathered soil material over bedrock. Deep soils are 40 or more inches deep. Moderately deep soils are 20 to 40 inches deep. Shallow soils are 10 to 20 inches deep.

The SCS has classified the soils at Angostura Reservoir as excessively drained, well drained, and very poorly drained. In excessively drained soils, water is removed very rapidly. These tend to be shallow, very porous, or steep, or a combination of these. Water is readily removed from well drained soils in the upper 40 inches of soil depth. In poorly drained soils, water is removed at such a slow rate that the soil becomes saturated. These have a slowly permeable layer, a water table, receive runoff or seepage, or are characterized by a combination of these. Different species of vegetation have adapted to specific soils. The drainage and moisture in soils influences their growth and abundance. Table 3-1 shows MUs and summarizes soil depth and drainage characteristics.

In Table 2-3, soils within individual MUs were looked at for suitability for recreational development, soil depth, and drainage characteristics for vegetative growth and management. Erosion potential was determined by shoreline erosion and impacts from human related activities including camping, roads, and grazing. Topography was used to determine the topographic constraints for management and recreation development at each MU.

Map 3-1 NRCS Soils Data



For example, a relatively flat area with access to the shoreline was considered as a good potential location for water based development, whereas a moderately rolling site with steep cliffs that prevented access to the shoreline was considered a constraint for development. The impacts based on these descriptions are assessed by MU.

Table 3-1 Soil Characteristics

Series	Characteristics	Management Unit
Arvada (Ar)	Deep, well drained, formed in clayey and loamy alluvium on broad flats, in drainages, and in alluvial fans.	15
Ascalon (AsB, AsC)	Deep, well drained soils formed in loamy material on uplands.	1, 2, 6, 7, 10, 11, 17, 22
Aquolls (Ap)	Deep, very poorly drained, nearly level, in slight depressions, flood plains where seepage water accumulated.	15, 18
Bankard (Bb)	Deep, excessively drained formed in sandy alluvium on floodplains	17
Butche (BvD)	Shallow, well drained, formed in weathered sandstone on uplands.	20, 21, 22, 24
Colby (Cnp)	Deep, well drained, calcareous, formed in silty and loamy material in uplands.	17
Dailey (DaB, DaC)	Deep, excessively drained, formed in sandy material on uplands.	1, 3, 5, 7, 9, 10, 11, 12, 13, 15, 16, 17, 23
Dwyer (DwA, SwB, DwE)	Deep, Excessively drained formed in sandy material on terraces and uplands.	15, 16, 17
Eckley (EaC)	Shallow, well drained, over gravelly sand.	17, 18, 19
Glenberg (Ga)	Deep, well drained, calcareous, formed in stratified loamy and silty alluvium on flood plains and low terraces.	17
Grummit (GrE, GsD)	Shallow, well drained, acidic, formed in weathered acid shale on uplands.	2, 3, 5, 8, 15, 17, 22, 24
Haverson (Ha)	Deep, well drained, calcareous, formed in alluvium on floodplains. Variant formed in loamy alluvium on foot slopes.	15, 16, 20
Jayem (JaB)	Deep, well drained, formed in loamy and eolian material on terraces and uplands.	21
Lohmiller (Lo)	Deep, well drained, calcareous, formed in silty and loamy alluvium on flood plains.	15, 17, 18
Mathias (MmE)	Deep, well drained formed in colluvial sediments weathered from sandstone and shale on mountains.	17, 23
Norka (NoB, NoC)	Deep, well drained, formed in eolian deposits on high terraces and uplands.	17, 19, 20
Nunn (NuA, NuB, NuC)	Deep, well drained, formed in loamy sediments on terrace and uplands.	10, 18
Pierre (PsE, PeB)	Moderately deep, well drained, formed in clayey material weathered from shale in uplands.	1, 2, 14, 15, 17
Rockoa (RrF)	Deep, well drained, formed in weathered sandstone and shale on uplands.	17

Series	Characteristics	Management Unit
Samsil (SaE)	Shallow, well drained, calcareous formed in residuum of shale on uplands.	9, 10, 13, 14, 15
Savo (SdB)	Deep, well drained, formed in silty and clayey sediments on terraces.	6
Schamber (SmE)	Shallow, excessively drained, formed in gravelly material on terraces.	13, 14, 15
Shingle (SnE)	Shallow, well drained, calcareous, form in residuum of soft shale or sandstone/shale on uplands.	8, 9, 10, 15, 19, 21
Stetter (St)	Deep, well drained, formed in clayey alluvium on flood plains.	19
Valent (VaE)	Deep, excessively drained, formed in sandy eolian deposits on uplands.	1, 3, 4, 5, 6, 10, 15, 21
Zigweid (ZnE)	Deep, well drained, formed in calcareous, loamy sediments on uplands and terrace escarpments.	1, 15, 17, 18, 19, 20

Environmental Consequences

No Action and Preferred Alternatives

If soil characteristics are disregarded in planning, there would be no significant impacts or public health and safety concerns', however, there would be a greater potential for erosion. The most important aspect of evaluating the impacts of the alternatives to soils is an understanding of soil characteristics. The greatest consequences from a lack of understanding or disregard of soil characteristics would be economic, due to the failure of a structure or costs associated with addressing soil erosion and/or drainage problems.

Most MUs are characterized by more than one soil type; therefore it is important to check soil characteristics where ever activities are proposed. This assessment looks at both potential impacts to soil by MU in Table 3-1 and the level of understanding of soil characteristics needed for proposed management activities.

Three levels of concern were established to provide an understanding of soil characteristics and their affects on proposed management activities.

High Concern

An understanding of soil characteristics are most important for the following activities: landscaping, irrigation systems, shelter belt, wildlife habitat and agricultural plantings, development of swimming beaches, construction of a below ground swimming pool, construction of sewer lagoons, individual septic systems, installation of fuel/chemical storage systems, road construction, and campground expansions/improvements.

Modifications in design and construction, soil amendments, and other practices can overcome potential constraints posed by poor soil suitability. However, higher design and construction

costs are likely to be incurred and as well increased maintenance relative to areas with good soil suitability.

Less Concern

Soil characteristics are of less concern for the development of primitive campsites, the construction of boat ramps, parking lots, trails, fish cleaning stations, construction of buildings requiring a slab/foundation, development of volley ball courts, campground expansions/improvements.

No Concern

Soil characteristics are of no concern for well development, radio communication equipment, location of burn piles, borrow pits, trash containers, installation of electrical service, potable water systems and pipelines, development of playgrounds, the installation of vault toilets and sewer pipes, installation of boat ramps/docks/lifts, break water systems and rip-rap, construction and maintenance of food service structures, and placement of displays and signs.

3.3 Water Quality

Affected Environment

Angostura Reservoir is warm and relatively shallow. It is mesotrophic (SDDENR 2008), meaning it is of medium productivity, clarity, depth, and temperature. The Cheyenne River and Horsehead Creek are the primary sources of inflows. Cascade Creek, which enters the Cheyenne River near the western edge of the reservoir, also is an important source of inflows.

Recent information on water quality in Angostura can be found in: *Integrated Report for Surface Water Quality Assessment* (SDDENR 2008); *Upper Cheyenne Watershed Assessment Draft Final Report, Fall River, Custer, and Pennington Counties, South Dakota* (Krantz and Larson 2006); *Nutrient Dynamics, Algal Biomass, and Factors Affecting Water Clarity in Angostura Reservoir, South Dakota* (Chippis and Selch 2005); *Angostura Reservoir 2004 Sedimentation Survey* (Reclamation 2005) *Angostura Unit Contract Negotiation and Water Management Final Environmental Impact Statement* (Reclamation 2002), *Angostura Unit Water Quality, Historical Perspectives for Future Research* (USGS 2000), *Water Quality and Sediment in the Cheyenne River Basin in Relation to the Angostura Contract Renewals* (Reclamation, 1999), *Irrigation Drainage Studies of the Angostura Reclamation Unit and the Belle Fourche Reclamation Project, Western South Dakota: Results of 1994 Sampling and Comparisons with 1988 Data* (Sando et al. 2001) and *Reconnaissance Investigation of Water Quality, Bottom Sediment, and Biota Associated with Irrigation Drainage in the Angostura Reclamation Unit, Southwestern South Dakota, 1988-1989*. (Greene et al. 1990).

Like all water bodies, Angostura Reservoir is assigned suitable beneficial uses by the state. Table 3-2 lists beneficial uses for all reservoirs in South Dakota and those listed specifically for Angostura (SDDENR 2008). Beneficial uses and water quality criteria (such as concentrations of a specific contaminant) are combined to develop water quality standards. The beneficial uses

are arranged from most to least restrictive. For example, domestic water supplies allow much lower concentrations of contaminants than irrigation water supplies. When a reservoir has several uses, criteria for the most restrictive use are followed.

Table 3-2 Beneficial Uses for South Dakota lakes and Angostura

Beneficial Use Designations for South Dakota Waters	Angostura Reservoir Designations
(1) Domestic water supply	X
(2) Coldwater permanent fish life propagation	
(3) Coldwater marginal fish life propagation	
(4) Warmwater permanent fish life propagation	X
(5) Warmwater semipermanent fish life propagation	
(6) Warmwater marginal fish life propagation	
(7) Immersion recreation	X
(8) Limited-contact recreation	X
(9) Fish & wildlife propagation, recreation and stock watering	X
(10) Irrigation	X
(11) Commerce and industry	

Angostura has continued to support all its designated beneficial uses except for “domestic water supply”. This is based on regular sampling as part of the “Lake Water Quality Assessment”. Angostura is currently not used for a domestic water supply, but would not meet that use because of its levels of total dissolved solids and sulfates (SDDENR 2008).

A more detailed summary of the water quality based on recent studies and summaries follows.

Nutrients

Recent studies at Angostura Reservoir indicate that the water is meeting trophic state index (TSI) values that support its beneficial use designation as a warmwater fishery. There is a concern that increased nutrients in the water would increase TSI values (Krantz and Larson 2006) (Reclamation 2002).

Fecal Coliform Bacteria

The swim beach at the reservoir is sampled weekly by SDGFP between Memorial Day and Labor Day for fecal coliform. In recent years, the beach was closed once in 2006 and once in 2007 because fecal coliform counts exceeded the standards for beach use. The reservoir continues to meet its beneficial uses for recreation because it has not met the “non-supporting” threshold of three beach closures in a consecutive three week sampling period.

Sampling conducted as part of the Upper Cheyenne Watershed assessment was discontinued when data indicated consistently low fecal coliform counts. This sampling was conducted at the sites established for all sampling for this study; it did not target specific areas and was not conducted during the recreation season.

Trace Metals

Dissolved trace metals were analyzed from surface and bottom samples from Angostura as part of the Upper Cheyenne Watershed Assessment. Of the metals sampled, two dissolved antimony samples exceeded the drinking water standard and 12 dissolved thallium samples exceeded the drinking water and fish consumption standards. The low number of samples collected for the Upper Cheyenne Watershed Assessment prevented a detailed analysis of metals, and additional sampling at the locations where standards were exceeded was recommended (SDDENR 2006).

The decommissioned Edgemont Uranium Mill is located upstream of the reservoir near the town of Edgemont. Operations of the mill ended in 1972 and it was decommissioned in 1982. Samples collected from the upper reach of the Cheyenne River and Cottonwood Creek from 1972-1997 indicated steady decreases in uranium concentrations from 1972-1974. Uranium samples, collected after operation of the mill ended, in the Cheyenne River upstream of Angostura showed that inflows into the reservoir seem to have been unaffected by any remains of the uranium operation, as the levels were below the Environmental Protection Agency drinking water standard for uranium (Reclamation 2002).

Sediment from the Cheyenne River in the headwaters of Angostura Reservoir, Angostura Reservoir, and the Cheyenne River below Angostura Dam were sampled by the United States Environmental Protection Agency (USEPA, 1971) for radium 226, gross alpha radiation, and gross beta radiation in 1966 (USGS 2000).

As radioactive elements decay, they produce other elements known as radionuclides or dissolved radioactivity. Data obtained from water samples collected from Angostura in 1971 indicated that dissolved radioactivity was fairly low (USGS 2000).

Suspended and Dissolved Solids

Total suspended solids (TSS) are high in Angostura as a result of high TSS in the Cheyenne River (Chipps and Selch 2005).

Total Dissolved Solids (TDS), Specific Conductivity (SC), and Sodium Adsorption Ratio (SAR) are measures of ions in a water sample. Ions such as calcium, magnesium, sodium, and potassium, and compounds of bicarbonates, carbonates, sulfates, and chlorides are often referred to as salts. As described in the Upper Cheyenne Watershed Assessment report, "High values of TDS, SC, and SAR indicate poor water for human and animal consumption. Irrigating with water high in ions, especially sodium, can damage soil and result in low crop production".

The Cheyenne River above Angostura is naturally high in TDS because of the underlying geology. Concentrations of TDS and sulfates in Angostura consistently violate state standards for domestic water supplies for TDS (Krantz and Larson 2006). However, they do not violate state standards for irrigation waters. Sampling and modeling conducted as part of the Upper Cheyenne Watershed Assessment indicate that inflows are the primary source of TDS and sulfates: and, Cascade Creek, the primary contributor of flows to the Cheyenne River during the study period, is the major source of these constituents. However, the water in Cascade Creek is

relatively low in sodium. Thus the water in Cascade Creek does not contribute to increased salinity or SAR in Angostura.

A preliminary conclusion from the Upper Cheyenne Watershed Assessment is that sulfate and TDS concentrations are naturally high and the reservoir would never support these uses for domestic water supply, thus this designation should be dropped.

Sediment

Quantity

Sediment builds up naturally in Angostura, primarily when inflowing water is slowed as it enters the reservoir, depositing its load of suspended soil and other materials. When Angostura was constructed in 1949, the surface area of the reservoir was 4,841 acres. The capacity was 159,919 acre-feet at top of conservation elevation of 3187.2 feet. The annual capacity loss from sedimentation was estimated at 1,700 acre-feet per year with an estimated useful reservoir life of 50 years. (Reclamation 1996)

Sedimentation surveys have been done in 1965, 1979, and 2004. The 2004 survey showed that the reservoir now has a surface area of 4,612 acres at top of conservation, with a storage capacity of 123,048 acre-feet. Since 1949, the reservoir has had an estimated volume decrease of 36,871 acre-feet, or a 23.0 percent loss in capacity. (Reclamation 2005)

The rate of sedimentation in Angostura has slowed considerably and the majority of it occurred in the first 16 years after construction. The 1965 survey measured a total sediment volume of 21,158 acre-feet, resulting in an annual capacity loss of 1,322 acre-feet. Between 1965 and 1979, the sediment volume accumulated was 7,993, resulting in an average annual capacity loss of 588 acre-feet. The 2004 survey showed a further reduction in the annual capacity loss of approximately 309 acre-feet. Changes in land use practices within the basin are thought to have contributed to this reduction in sedimentation.

Quality

During the 2004 survey, sediment samples were collected at the mouths of Horsehead Creek and the Cheyenne River and an area of sediment deposition approximately 300 feet upstream from the Angostura Dam. These samples were analyzed for ions, nutrients, and trace elements.

Sediment samples were collected from the reservoir in 1997 (Reclamation 2002). Concentrations of chemicals found in the sediment were compared to baseline conditions expected in western soils of the region (Shacklette and Boerngen, 1984). In Angostura Reservoir, uranium exceeded the upper confidence limit of the soils baseline by 0.5 ppm at one site near the dam. The selenium sample collected near the dam also exceeded the soils baseline by 0.5 ppm. All of the three molybdenum samples from the reservoir exceeded the soils baseline. All of these may have originated from natural weathering of uranium containing rocks or uranium mining (Reclamation 1999). No other reservoir samples exceeded the baseline.

Sediment samples collected in the reservoir in 1966 were analyzed for dissolved radioactivity, which was found to be consistent with background contamination (U.S.G.S 2000).

Environmental Consequences

No Action Alternative

The recreation and land management activities currently occurring at Angostura are not expected to negatively impact the existing water quality. The reservoir is expected to continue to meet its beneficial uses, with the exception of domestic water supply.

Improvement to waste water disposal systems and management of uplands and riparian areas for wildlife production would reduce the potential for localized impacts to water quality.

The natural process of sedimentation is expected to continue to occur in the reservoir, but at a much slower rate than originally projected. Boating hazards and bays with high sediment deposits would continue to be present.

Preferred Alternative

The additional recreation and land management activities proposed under this alternative are not expected to negatively impact the existing water quality. The reservoir is expected to continue to meet its beneficial uses with the exception of domestic water supply.

Improvement to waste water disposal systems and management of uplands and riparian areas for wildlife production would reduce the potential for localized impacts to water quality.

The natural process of sedimentation is expected to continue to occur in the reservoir, but at a much slower rate than originally projected. Proposed management activities which remove or reduce sedimentation that creates boating hazards would be beneficial. There may be short term impacts to water quality from dredging. These impacts would be minimized by following proper procedures for containing and disposing of sediments.

3.4 Vegetation

Affected Environment

This section identifies vegetated areas including natural communities, rangelands, wetlands, riparian areas, and noxious weeds that may be affected by the alternatives. The following discussion centers on vegetative and natural communities within two distinct ecoregions (following Omernik 1987 and refinement by EPA 2005) in the Project Area on the lands surrounding Angostura Reservoir. Ecoregions are used to describe the environmental conditions and natural features of an area. These lands encompass two ecoregions: the Middle Rockies ecoregion located on the western portion of Reclamation lands surrounding the Cheyenne River, and the Northwestern Great Plains ecoregion covering the remainder of the reservoir lands (Figure 3).

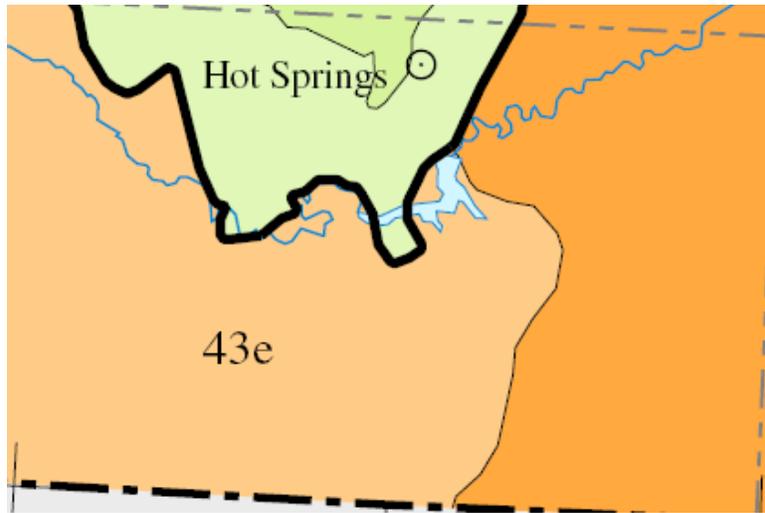


Figure 3 Ecoregions in the Project Area of potential effects

The western area of Angostura Reservoir lands in the Black Hills foothills is characterized by high elevation grassy parkland. Native vegetation includes ponderosa pine woodlands, especially on the northern faces of hills, with grass understory of little bluestem, gamma grasses, and leadplant. In the Missouri Plateau area of the Northwestern Great Plains, which includes the sagebrush steppe and semiarid Pierre shale plains, native grasslands have been commonly replaced by cultivated spring wheat and alfalfa. Native vegetation includes prairie sagewort, big sagebrush, western wheatgrass, green needlegrass, blue gramma, Sandberg bluegrass, and buffalo grass.

Reclamation has a Dakotas Area Office Integrated Pest Management Plan (IPM) in place for Dakotas Area project lands and facilities, including Angostura Reservoir. This IPM plan was developed to provide guidance for techniques used to control weeds and other pests.

Noxious weeds of greatest concern at Angostura Reservoir include thistle species and salt cedar. Recent effects of the drought include an expansion of invasive species on exposed shoreline and riparian areas. SDGFP utilizes a variety of IPM management techniques to manage these additional areas. Biological control agents for both saltcedar and Canada thistle were released at Angostura Reservoir. Saltcedar leaf beetles (*Diorhabda elongate deserticola*) have been released at a saltcedar infestation on the Cheyenne River. The Division of Parks and Recreation released Canada thistle stem-mining weevil, *Ceutorhynchus litura* and Canada thistle stem gall fly (*Urophora cardui*) biological control agents at Canada thistle infestations at Horsehead Campground, Cheyenne Lakeside Use Area, and along the Cheyenne River.

There are two prairie dog towns located within the resource area. Prairie dog towns would be managed with the IPM.

Natural communities

Natural communities were identified using South Dakota Natural Heritage Inventory data survey of reservoir lands provided by the SDGFP (Backlund 2008).

There are two reports which showed two occurrences of the natural community, Sand Sagebrush/Prairie Sandreed Shrubland Community as noted in Table 2-3. The Sand Sagebrush/Prairie Sandreed Shrubland Community has sparse to moderate vegetative cover with the bare areas being sand. These areas can occur on lower or high sand ridges or sandhills where the sand sagebrush forms a mosaic with yucca shrub grasslands. These communities are also habitat for the flightless and nocturnal tiger beetle (*Amblychelila cylindriformis*) (see Table 2-3). The tiger beetle and other wildlife specific element occurrences are discussed in the Wildlife Section.

Environmental Consequences

No Action Alternative

There are no anticipated consequences or impacts to natural communities associated with this alternative for all MUs; except Hat Creek Campground – MU 9, Horsehead Game Production Area – MU 15, Cheyenne River Lakeside Use Area – 18, Mule Deer Ridge – 22, and Angostura Reservoir – 25, where minor impacts could occur with no RMP in place but are not anticipated.

Preferred Alternative

There are no anticipated consequences or impacts to natural communities associated with this alternative for all MUs.

Rangelands

In June 2007, Reclamation contracted with North Wind, Inc. of Idaho Falls, Idaho, to conduct rangeland and riparian health assessments on Reclamation land at the reservoir. They assessed 13 upland locations (MUs 15, 17, 18, 20, and 22) and 4 riparian locations along 4 river reaches around Angostura Reservoir using *Interpreting Indicators of Rangeland Health (Version 4)* (Pellant et al. 2005). Information on riparian health was collected using the Natural Resources Conservation Service (NRCS) riparian assessment method (Pick et al. 2004).

A list of vegetation identified on rangeland sites are listed in Table 3-3. Much of the lands surrounding Angostura Reservoir have historically been used for grazing of cattle and many areas along the Cheyenne River and Horsehead Creek have experienced unrestricted livestock access. This has degraded much of the native grasses introducing annual grasses (field brome and cheatgrass) and forbs. Past agricultural practices have also allowed for introduced annual grasses.

Table 3-3. Rangeland vegetation found on Angostura Reservoir lands

Common Names	Scientific Names
Crested wheatgrass	<i>Agropyron cristatum*</i>
Cuman ragweed	<i>Ambrosia psilostachya</i>
Leadplant	<i>Amorpha canescens</i>
Field pussytoes	<i>Antennaria neglecta</i>
Plains milkweed	<i>Asclepias pumila</i>
Silver sagebrush	<i>Artemisia cana</i>
Sand sagebrush	<i>Artemisia filifolia</i>
Prairie sagewort	<i>Artemisia frigida</i>
Big sagebrush	<i>Artemisia tridentata</i>
Purple threeawn	<i>Aristida purpurea</i>
Gramma grasses	<i>Bouteloua sp.</i>
Buffalo grass	<i>Bouteloua dactyloides</i>
Blue gramma	<i>Bouteloua gracillis.</i>
Field brome	<i>Bromus arvensis*</i>
Cheatgrass	<i>Bromus tectorum*</i>
Thistle	<i>Carduus sp.*</i>
Threadleaf sedge	<i>Carex filifolia</i>
Lambsquarters	<i>Chenopodium album</i>
Butte candle	<i>Cryptantha celosioides</i>
Onespike danthonia	<i>Danthonia unispicata</i>
Slender wheatgrass	<i>Elymus trachycaulus</i>
Broom snakeweed	<i>Gutierrezia sarothrae</i>
Needle-and-thread	<i>Hesperostipa comata</i>
Common pepperweed	<i>Lepidium densiflorum</i>
Rush skeletonplant	<i>Lygodesmia juncea</i>
Alfalfa	<i>Medicago sp.</i>
Yellow sweetclover	<i>Melilotus officinalis</i>
Green needlegrass	<i>Nassella viridula</i>
Plains pricklypear	<i>Opuntia polyacantha</i>
Western wheatgrass	<i>Pascopyrum smithii</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Woolly plantain	<i>Plantago patagonica</i>
Sandberg bluegrass	<i>Poa secunda</i>
Slimflower scurfpea	<i>Psoralidium tenuiflorum</i>
Bluestem	<i>Schizachyrium scoparium</i>
Tall tumbled mustard	<i>Sisymbrium altissimum*</i>
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
White heath aster	<i>Symphotrichum ericoides</i>
Intermediate wheatgrass	<i>Thinopyrum intermedium*</i>
Field pennycress	<i>Thlaspi arvense</i>
Yellow salsify	<i>Tragopogon dubius</i>
Spring wheat	<i>Triticum sp.</i>
Mullein sp.	<i>Verbascum sp.</i>
Sixweeks fescue	<i>Vulpia octoflora</i>
Soapweed yucca	<i>Yucca glauca</i>

* Introduced

MU areas 1-14, 16, 19, 21, 23 and 24 have been altered for dam operations (MU 21) and recreational use. Therefore rangeland health was not assessed on these MUs. However, Horsehead Day Use Area – MU 10, and Horsehead Campground – MU 11, does have a unique sandsage/sandreed shrubland community which is disturbed by grazing, roads, human trampling and invasion of weedy species (curlycup gumweed -*Grindelia squarrosa*). This sparse to moderately vegetative community is usually dominated by sand sagebrush and is confined to the highest sand hills and ridges.

North Wind's assessment of the 13 upland locations in MUs 15, 17, 18, 20, and 22 indicated the cover type remains mostly vegetative (North Wind 2007). Grassland conditions are listed in Table 2-3 for these MUs. Overall, samples taken across these MUs show varying degrees of degradation and vegetation in many areas has been invaded by less desirable grasses and forbs. In many cases non-native grasses, such as cheatgrass and field brome, make up the majority of vegetation at a site.

Environmental Consequences

No Action Alternative

There are no anticipated negative consequences or impacts to vegetative rangeland associated with this alternative for all MUs, although beneficial impacts could occur due to boundary fencing.

Preferred Alternative

Vegetative rangeland conditions at Turkey Draw – MU 3, South Trailer Area – MU 13, Shale Banks Day Use Area – MU 14, Bailey's Lakeside Use Area – MU 16, Angostura Dam – MU 21, North Trailer Area – MU 24, and Angostura Reservoir – MU 25, would remain the same as existing conditions. Other areas would experience some change as identified in Table 2-3, which includes a range from minor to some loss of vegetation, improvement of vegetation, or exchange of one vegetation type to another. In Cheyenne Campground – MU 2, Picnic Point Day Use Area – MU 5, and Shep's Canyon Lakeside Use Area – MU 19, there would be a minor to some loss of vegetation.

Cumulative Impacts

Impacts to vegetative rangeland from the Preferred Alternative would be relatively minor. The only present or reasonably foreseeable non-Project future actions, that would elevate these minor impacts to changes of a greater magnitude, could be the continued trespass of cattle onto federal lands until fencing is established. Weed control on adjacent lands may also elevate minor impacts due to the Preferred Alternative, if current control is not maintained.

Wetlands

Wetlands were quantified on Angostura Reservoir lands using National Wetland Inventory data. Wetlands connected to land outside the reservoir boundary were included as they could be impacted by activities on reservoir lands.

Fall River County has 7,883 wetland basins including Angostura Reservoir. The Project Area contains 138 wetland basins. Wetlands are described by MU in Table 2-3. Angostura Reservoir is a manmade, deep water wetland with 4,612 acres of surface area at elevation 3187.2 feet.

The National Wetland Inventory Mapping used to create Map 3-2 shows the main body of lacustrine deepwater habitats as only 4,221 acres which excludes back bays or lacustrine habitats associated with specific MUs, which were calculated and associated with specific MUs.

Some shallow marsh or palustrine habitats occur along the shore. Many of these areas are exposed during drought or summer drawdown from irrigation. Palustrine wetlands also occur in uplands surrounding the reservoir, including natural depressions or small manmade impoundments, some which rely on precipitation for their existence. Riverine wetlands include the channels of the Cheyenne River and Horsehead Creek, while riparian wetlands occur adjacent to these channels.

Environmental Consequences

No Action Alternative

There are no anticipated consequences or impacts to wetland areas associated with this alternative for all MUs.

Preferred Alternative

Wetland conditions would remain the same as existing conditions with this alternative for all MUs, except the Horsehead Game Production Area – MU 15, Cheyenne River Natural Area – MU 17, and Angostura Reservoir – MU 25, where some improvements in wetland conditions and water quality could occur with land use and natural resource RMP objectives in place.

Cumulative Impacts

Impacts to wetlands from the action alternatives would be relatively minor. There are no known present or reasonably foreseeable non-Project future actions that would elevate these minor impacts to changes of a greater magnitude.

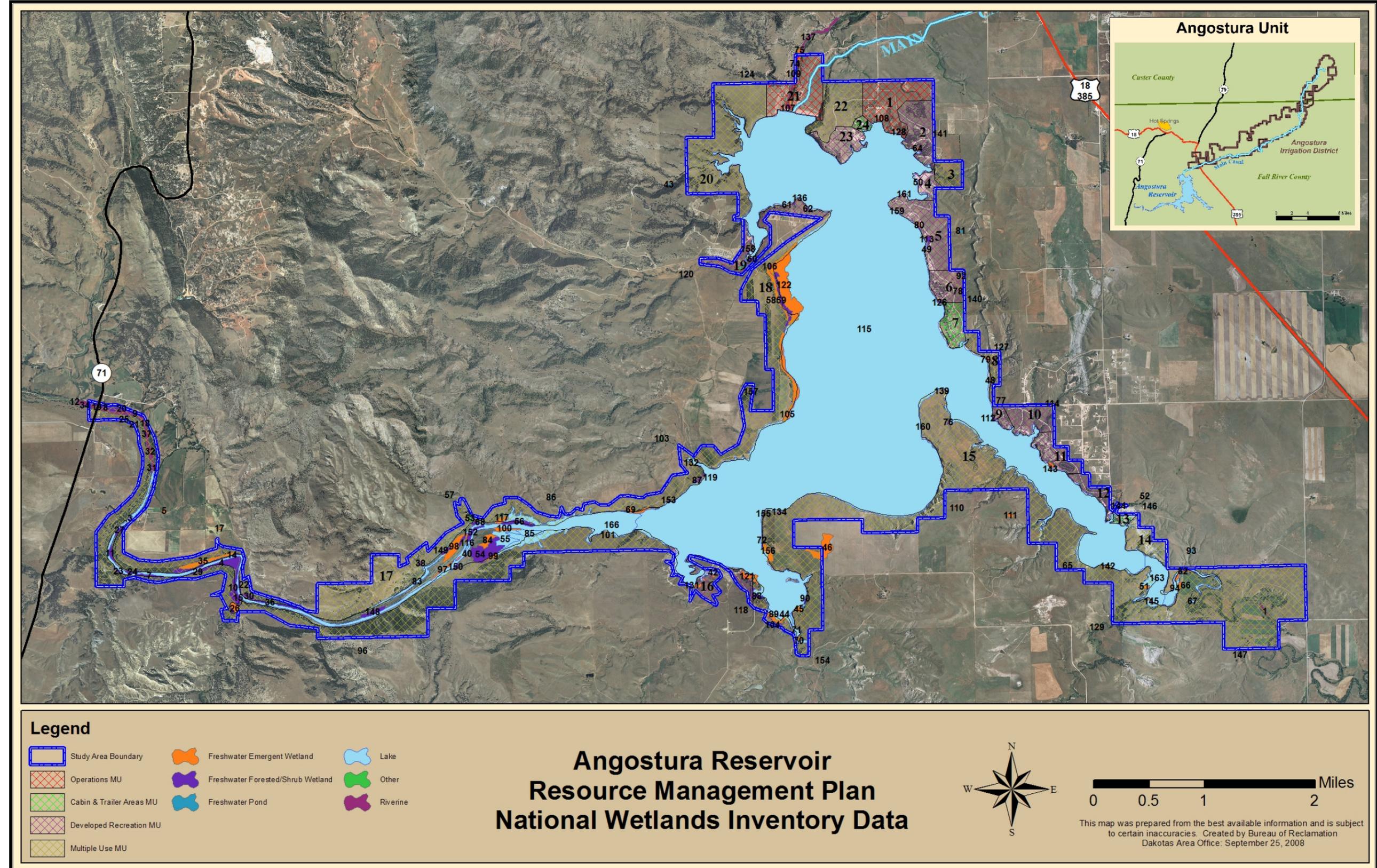
Wetlands Definitions

Lacustrine wetlands typically are open water depressions lacking vegetation except around the edges. Angostura Reservoir itself is lacustrine.

Riverine wetlands are typically narrow, wet areas within a channel. These wetlands, which are common along the Cheyenne River and Horsehead Creek, usually are flowing or at least soaked periodically, because both surface and subsurface water flows toward them.

Palustrine wetlands are typically shallow to wet basins usually dominated by vegetation.

Map 3-2 National Wetlands Inventory



Riparian

A list of riparian vegetation is listed in Table 3-3. Riparian areas are identified as transitional zones between river and upland communities where vegetation is influenced by water. The resource area includes the transitional areas adjacent to the Cheyenne River MUs and Horsehead Creek.

As part of the North Wind study three specific reaches of the Cheyenne River (Cheyenne River Natural Area – MU 18) and one reach of Horsehead Creek (Horsehead Game Production Area – MU 15) were evaluated for their riparian condition. Riparian conditions are reported in Table 2-3.

Table 3-3 Riparian vegetation found on Angostura Reservoir lands

Common Names	Scientific Names
Cuman ragweed	<i>Ambrosia psilostachya</i>
Sand sagebrush	<i>Artemisia filifolia</i>
Field brome	<i>Bromus arvensis</i> *
Cheatgrass	<i>Bromus tectorum</i> *
Littleseed falseflax	<i>Camelina microcarpa</i>
Thistle	<i>Carduus sp.</i> *
Threadleaf sedge	<i>Carex filifolia</i>
Lambsquarters	<i>Chenopodium album</i>
Bull thistle	<i>Cirsium vulgare</i> *
Field bindweed	<i>Convolvulus arvensis</i> *
Redosier dogwood	<i>Cornus sericia</i>
Desert stickseed	<i>Hackelia sp.</i>
Needle-and-thread	<i>Hesperostipa comata</i>
Foxtail barley	<i>Hordeum jubatum</i>
Baltic rush	<i>Juncus balticus</i>
Rush	<i>Juncus sp.</i>
Rocky mountain juniper	<i>Juniperus scopulorum</i>
Prickly lettuce	<i>Lactuca serriola</i>
Clasping pepperweed	<i>Lepidium perfoliatum</i>
Rush skeletonplant	<i>Lygodesmia juncea</i>
Alfalfa	<i>Medicago sp.</i>
Yellow sweetclover	<i>Melilotus officinalis</i>
Reed canary	<i>Phalaris arundinacea</i>
Woolly plantain	<i>Plantago patagonica</i>
Narrowleaf cottonwood	<i>Populus angustifolia</i>
Common cottonwood	<i>Populus deltoides</i>
Smooth sumac	<i>Rhus glabra</i>
Currant	<i>Ribes sp.</i>
Curly dock	<i>Rumex crispus</i>
Sandbar willow	<i>Salix interior</i>
Bluestem	<i>Schizachyrium scoparium</i>
Threesquare bulrush	<i>Schoenoplectus pungens</i>

Tall tumblemustard	<i>Sisymbrium altissimum</i> *
Scarlet globemallow	<i>Sphaeralcea coccinea</i>
Salt cedar	<i>Tamarix ramosissima</i> *
Common dandelion	<i>Taraxacum officinale</i>
Intermediate wheatgrass	<i>Thinopyrum intermedium</i> *
Field pennycress	<i>Thlaspi arvense</i>
Cattail	<i>Typha sp.</i>
Mullein sp.	<i>Verbascum sp.</i>
Cocklebur	<i>Xanthium strumarium</i>
Yucca	<i>Yucca sp.</i>

* Introduced

Environmental Consequences

No Action Alternative

There are no anticipated consequences or impacts to riparian areas associated with this alternative for all MUs, except the Horsehead Game Production Area – MU 15 and Cheyenne River Natural Area – MU 17, where some improvements could occur under existing management practices on these areas.

Preferred Alternative

Riparian conditions would remain the same as existing conditions with this alternative for all MUs, except the Horsehead Game Production Area – MU 15, Cheyenne River Natural Area – MU 17, and Angostura Dam – MU 21, where some improvements could occur with land use and natural resource RMP objectives in place.

Cumulative Impacts

Impacts to riparian areas from the action alternatives would be relatively minor. The only present or reasonably foreseeable non-Project future actions that would elevate these minor impacts to changes of a greater magnitude could be the continued trespass of cattle onto federal lands until fencing is established. Weed control on adjacent lands may also elevate minor impacts due to action alternatives if current control is not maintained.

3.5 Fish and Wildlife

Affected Environment

The vegetation types (see Section 3.4) define wildlife habitats within the Project Area. The conditions of these habitats are described in the previous section on natural resource lands.

Mammals

Wildlife is present in all MUs. Most of the wildlife occurs in the MUs where the cover type is vegetative, and to a lesser degree in MUs where dam operations and recreation occur (MUs 15, 17, 18, 20, and 22). Mammals that likely inhabit the area include coyote, pronghorn antelope, mule deer, whitetail deer, jackrabbit, cottontail rabbit, red fox, porcupine, raccoon, fox squirrel, black-tailed prairie dog, bats, beaver, and variety of small mammals (e.g. shrews, voles, thirteen-lined ground squirrel, gophers, variety of mice species) (Higgins et. al. 2000).

Migratory birds

The reservoir offers a unique resource to migrating waterbirds that follow the eastern edge of the Black Hills. The reservoir also provides habitat for migrant passerine species that travel along the Cheyenne River on their twice-yearly flights to and from the north and the west. In the summer of 1911, seventy-six species of birds were observed (Visher 1912). Although this compilation is an old list, many of these species still occur in this county (Peterson 1995). Birds most common to the reservoir area would include various types of waterfowl, shorebirds, gulls and other waterbirds. Habitats along the Cheyenne River and Horsehead Creek provide habitat for owls, bald eagles, hawks, turkeys, flickers, chickadee, orioles, and robins. Rangeland habitats likely provide for hawks, burrowing owls, western meadowlarks, horned larks, and grassland sparrow species.

Fisheries

Angostura Reservoir at elevation 3187.2 feet extends about 17 miles up the Cheyenne River and 7.6 miles up Horsehead Creek. The reservoir has 4,612 surface-acres of water at this elevation. Water elevations on the reservoir fluctuate greatly from month to month and year to year, depending on inflows and irrigation releases. Fluctuating water elevations prevent extensive development of aquatic vegetation, essential for fish spawning, as well as escape cover for larval fish.

Fluctuating water elevations can be responsible for low reproductive success of gamefish and forage species at the reservoir. While not extensive, some aquatic vegetation has developed in the inlets and shallows on the west side of the reservoir. Management actions of the SDGFP have been completed to help fish habitat in the reservoir including anchoring Christmas trees to the bottom of the reservoir in shallow areas (e.g. north shoreline near the north boat ramp).

Primary sport and prey fishes include black crappie, channel catfish, emerald shiner, gizzard shad, largemouth bass, smallmouth bass, spottail shiner, and walleye (Meester 2000). SDGFP instituted a fish stocking program because of low reproductive success. In recent years, walleye and largemouth bass have been stocked. Emerald shiner and gizzard shad have also been introduced to supplement the forage base for game fish. In 2007 gizzard shad catches during survey efforts substantially increased over 2006, indicating good reproduction in 2007. Table 3-4 lists species found in the reservoir.

Table 3-4 Fish Species in the Reservoir

Common Name	Scientific Name
Walleye	<i>Sander vitreus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Emerald shiner	<i>Notropis atherinoides</i>
White sucker	<i>Catostomus commersoni</i>
Bluegill	<i>Lepomis macrochirus</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Channel catfish	<i>Ictalurus punctatus</i>
Black bullhead	<i>Ameiurus melas</i>
Yellow perch	<i>Perca flavescens</i>
Common carp	<i>Cyprinus carpio</i>
Northern pike	<i>Esox lucius</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Spottail shiner	<i>Notropis hudsonius</i>
Rockbass	<i>Ambloplites rupestris</i>
Green sunfish	<i>Lepomis cyanellus</i>
Northern redhorse	<i>Moxostoma aureolum</i>
River carpsucker	<i>Carpionodes carpio</i>
Fathead minnow	<i>Pimephales promelas</i>

The fishery in the Cheyenne River below Angostura Dam to the confluence of the Belle Fourche River is typical of western streams after the introduction and management of non-native species. Water is colder here than water downstream and less turbid since the reservoir acts as a settling basin. The influence of Angostura Reservoir at elevation 3187.2 feet extends about 7.6 miles up Horsehead Creek in Horsehead Game Production Area – MU 15. Horsehead Creek typifies a warmwater Great Plains stream (Duehr 2004) and includes the Golden shiner (*Notemigonus crysoleucas*) largemouth bass, white sucker, black bullhead, green sunfish, yellow perch, common carp, and northern pike

Environmental Consequences

No Action Alternative

There are no anticipated consequences or impacts to wildlife and fish habitats associated with this alternative for all management MUs, except the Horsehead Game Production Area – MU 15 and Cheyenne River Natural Area – MU 17, where some improvements could occur under existing management practices on these areas. Short-term or temporary disturbances from construction activities for fish and wildlife would be minor.

Preferred Alternative

There are no anticipated consequences or impacts to wildlife and fish habitats associated with this alternative for all MUs, except the Horsehead Game Production Area – MU 15, Cheyenne River Natural Area – MU 17, and Angostura Dam – MU 21, where some improvements could

occur with land use and natural resource RMP objectives in place. All other areas could experience some change as identified in Table 2-3, which include a range from minor to some loss of vegetation, improvement of vegetation, or exchange of one vegetation type to another. Short-term or temporary disturbances to wildlife or fisheries from construction activities may occur but would be tempered by environmental commitments. Quality of wetlands and riparian areas may improve with environmental commitments and RMP Land use and Natural Resource objectives in place, thus improving water quality for fisheries in Angostura Reservoir and the Cheyenne River.

Cumulative Impacts

Impacts to wildlife and fish habitats from the Preferred Alternative would be relatively minor. The only present or reasonably foreseeable non-Project future actions that would elevate these minor impacts to changes of a greater magnitude could be the continued trespass of cattle onto federal lands until fencing is established. Weed control on adjacent lands may also elevate minor impacts due to the Preferred Alternative if current control is not maintained. Inability to improve septic tank issues in the area could impact water quality. Increased recreational use potential due to facility changes and expansions could affect wildlife and fishery resources, including changing in feeding, nesting, denning, bedding, wintering, resting, and staging areas for wildlife and population, diversity, and condition changes for fisheries. These should not elevate beyond minor or temporary limits under management agreements with SDGFP.

3.6 Threatened, Endangered, Candidate and Sensitive Species

Affected Environment

Introduction

The vegetation types (see Section 3.4) define wildlife habitats within the Project Area. The conditions of these habitats are described in the previous section on natural resource lands.

State listed species and species of special concern were identified using South Dakota Natural Heritage Inventory data survey of reservoir lands provided by SDGFP. Doug Backlund, Wildlife Biologist (personal communication) reported element occurrence records for the Project Area from the South Dakota Natural Heritage Database. This database is used to identify high quality natural areas and important species and their habitats. The US Fish and Wildlife Service's (USFWS) *Endangered Species by County List* and the *Candidate Species by County List* (<http://www.fws.gov/southdakotafieldoffice/endsppbycounty.htm> accessed on 29 April 2008) show no federally listed species for Fall River County.

Existing Conditions

Table 3-5 lists the species that may occur in the Project Area and lists specific MUs with records of those species.

Table 3-5 State and Federally Protected Species and Species of Special

Species	Status*	Location
Bald eagle <i>Haliaeetus leucocephalus</i>	State threatened	Cheyenne River Lakeside Use Area
Common merganser <i>Mergus merganser</i>	State rank S2B, S3N	Mule Deer Ridge
High Plains tiger beetle <i>Amblycheila cylindriformis</i>	S1	Horsehead Day Use Area
Spiny softshell <i>Apalone spinifera</i>	S2	Cheyenne River Lakeside Use Area
Piping plover <i>Charadrius melodus</i>	*Federal and State threatened	Cheyenne River Lakeside Use Area
Six-lined racerunner <i>Cnemidophorus sexlineatus</i>	S2	Cheyenne River Lakeside Use Area

*S1 species are critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction. S2 species are imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range. S3 species are either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors and in the range of 21 of 100 occurrences. S2B, S3N means S2 rank in breeding season and S3 in nonbreeding season.

*The USFWS does not list the piping plover for Fall River County.

Bald Eagle (State Threatened)

In July 2007 the bald eagle was delisted from the Federal List of Endangered and Threatened Wildlife and Plants. Bald eagles continue to be protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both federal laws prohibit “taking” (killing), selling, or otherwise harming eagles, their nests, or eggs. In South Dakota the bald eagle is considered as state threatened. Eagles have been documented using Angostura Reservoir during the migration and wintering periods. They are usually found in large trees adjacent to the reservoir or Cheyenne River. Wintering eagles depend primarily on fish that are available on the reservoir. However, they are opportunistic feeders and take rabbits, waterfowl, and carrion.

Common Merganser (State rank rare)

The Common Merganser is a waterfowl found on lakes and rivers. It nests usually in tree cavities. However, they also nest on the ground and in nest boxes, generally near clear waters of lakes and rivers. Common mergansers mainly eat fish obtained by diving underwater. They feed on amphibians, crustaceans, mollusks, and other invertebrates. Young initially feed on insects, mostly caught underwater. The record of mergansers on Angostura Reservoir was of a female with five young last observed in 1983 (D. Backlund personal communication).

High Plains Tiger Beetle (State rank extremely rare)

The High Plains tiger beetle is restricted to sand sage habitat. In South Dakota this species occurs only in the Angostura Reservoir and Cascade Springs area. This is the northernmost occurrence for this species. This insect reaches a length upwards of 35 mm and is one of the largest insects of the Great Plains. This species is flightless and nocturnal and does not need a large, connected site for movement, foraging or dispersal. Tiger beetles are active predators and scavengers on other insects, and as such they are beneficial by their feeding on many pest species. The name “tiger” beetle refers to their predatory voracity. Paul Johnson

<http://nathist.sdstate.edu/SMIRCOL/amblycheila.htm>

accessed 30 April 2008) reports rough densities of 100-120 per acre in the Angostura area. The extent of the Angostura site is estimated at about 100 acres (Hall et al. 2002). Habitat at Angostura Reservoir includes sagebrush steppe or shortgrass prairie in their original vegetation. Extensive disturbance of rangeland through cultivation, including crested wheatgrass plantings, markedly changed the vegetation in Fall River County, but the local beetle populations appear to have survived in those areas extensive with remaining natural vegetation.



Figure 3 High Plains tiger beetle. Photo by P.J. Johnson, 1995.

Spiny softshell (State rank rare)

The spiny softshell turtle is so-named for the spiny projections on the forward edge of its carapace, the edge behind its head. Young may hatch from August through October. In the northern reaches of its range, the spiny softshell will hibernate underwater, beneath several inches of mud. Found in a wider variety of habitats, the spiny softshell may inhabit swift-flowing rivers, oxbow wetlands, lakes or impoundments like Angostura reservoir. This turtle was observed and captured in the Angostura Reservoir at the Cheyenne River Lakeside Use Area and may commonly be seen basking on floating debris, rocks or logs, sometimes in large groups. It is an active predator. The spiny softshell seeks prey by swimming and searching under water, or by probing its snout into vegetation and under rocks.

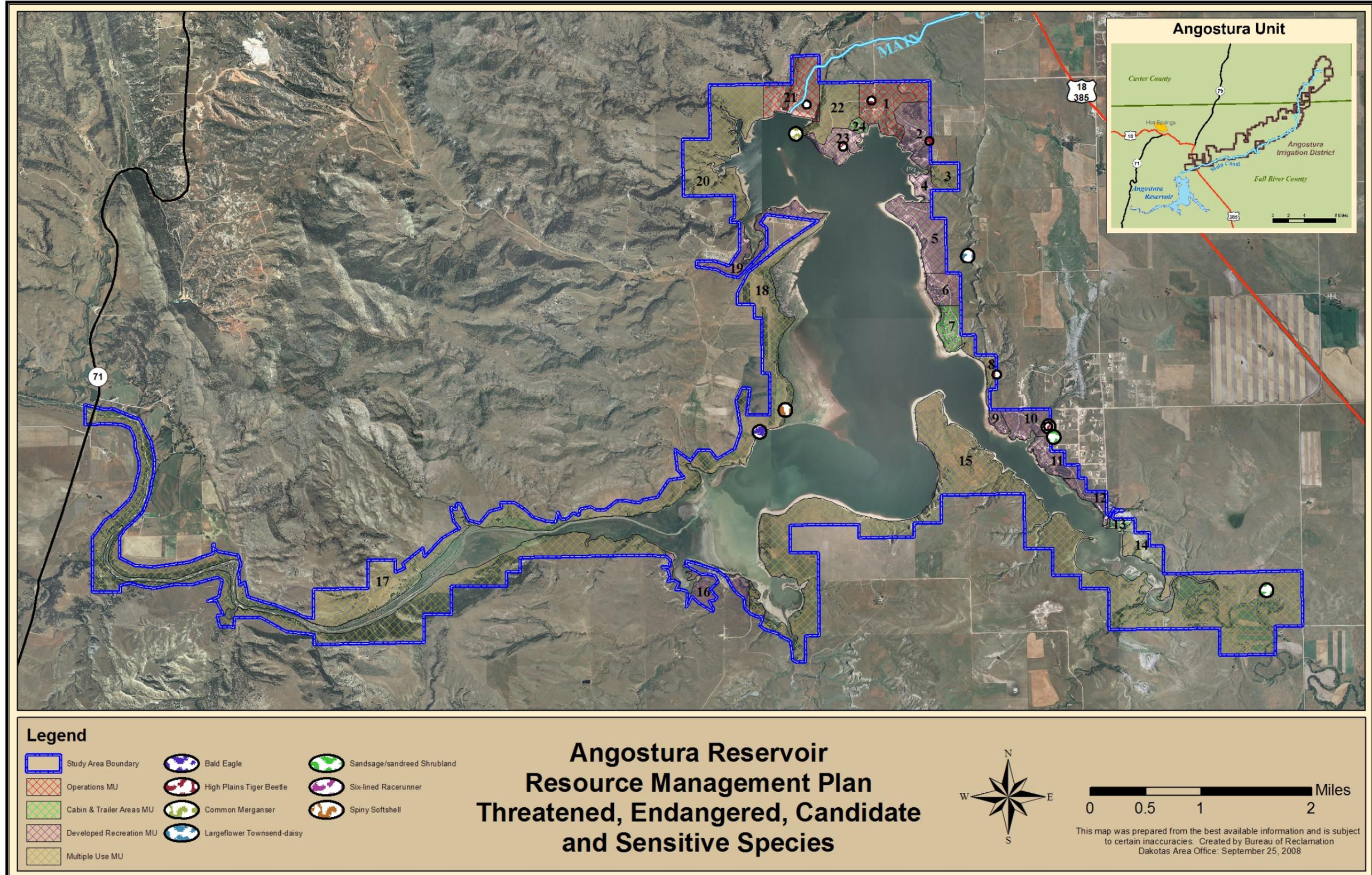


Figure 4 Spiny softshell (photo courtesy of SDGFP)

Piping plover (Federal and State threatened)

The piping plover was listed in 1985 as threatened by USFWS in all of its range outside the Great Lakes (where it's listed as endangered). It is listed as threatened by SDGFP. There is one record of the piping plover for Angostura Reservoir described as “male vigorously defending territory” in late May 1981 (Doug Backlund personal communication). This bird was likely opportunistic nesting when Angostura reservoir levels were low and the natural sand shorelines were exposed.

Map 3-3 Threatened and Endangered Species and Species of Special Concern



This species is currently not listed by the USFWS for Fall River County; therefore, a Section 7 of the Endangered Species Act consultation is not required.

Six-lined Racerunner ((State rank rare)

This racerunner lizard inhabits sunny areas with open ground, grassland, sandhills, sandy or gravelly banks and floodplains of streams, sparsely vegetated rocky areas at base of mountains, woodland edges and open woods, and beach dunes. It was found to be somewhat common in sandy areas along the shore of Angostura Reservoir (Doug Backlund personal communication). It generally takes shelter underground or under rocks or other objects on the ground. Eggs are laid in a nest dug in soft soil or sawdust pile (Mount 1975) or under logs or other sheltering objects (Barbour 1971). This lizard prefers soil with high sand content and/or hardened clay with numerous open patches of bare ground. The diet varies with prey availability; in our region, it typically includes grasshoppers, crickets, adult and larval lepidopterans, beetles, bugs, ants, spiders, and snails (Collins 1982). It lays 1-3 clutches of 1-6 eggs, May-August (Stebbins 1985). Eggs hatch in about 2 months (Behler and King 1979).



Figure 5 Six-lined Racerunner (photo courtesy of Doug Backlund)

Environmental Consequences

Under NEPA, the effects of the alternatives on federally protected species and species of special concern in the Project Area are measured against the No Action Alternative. The No Action Alternative is current management of Angostura Reservoir lands without a RMP. Therefore, the analysis in this section evaluates the effects of the Preferred Alternative in comparison to the No Action Alternative, in compliance with the NEPA.

The USFWS South Dakota Field Office website was reviewed and no federally listed species were listed for Fall River County. The South Dakota Field Office was contacted by telephone and confirmed their website information and related that they would review this EA in regard to any further consultation.

State and Federally Protected Species and Species of Special Concern

No Action Alternative

There are no anticipated consequences or impacts to State and Federally Protected Species and Species of Special Concern associated with this alternative for all MUs, except Hat Creek Campground – MU 9, Horsehead Game Production Area – MU 15, Cheyenne River Lakeside Use Area – MU 18, Mule Deer Ridge – MU 22, and Angostura Reservoir – MU 25, where minor impacts could occur with no RMP in place, but are not anticipated.

Table 3-6 Environmental Consequences on State and Federally Protected Species and Species of Special Concern at Angostura Reservoir under all alternatives.

Species	Status*	Habitats	Impacts	
			No Action Alternative	Preferred Alternative
Bald eagle <i>Haliaeetus leucocephalus</i>	State threatened	Trees adjacent to Reservoir and along Cheyenne River	Not expected under current management	Not likely to be impacted with environmental commitments and land use and natural resource RMP objectives in place
Common merganser <i>Mergus merganser</i>	State rank S2B, S3N	On Reservoir and adjacent shoreline areas	Could be impacted if water quality deteriorates	Not likely to be impacted with environmental commitments and land use and natural resource RMP objectives in place
High Plains tiger beetle <i>Amblycheila cylindriformis</i>	S1	On sandsage/sandreed shrubland habitats	Could occur with increased recreational use and continued deterioration of sandsage/sandreed shrubland habitats	Not likely to be impacted and population could expand into Horsehead Game Production area with environmental commitments and land use and natural resource RMP objectives in place.
Spiny softshell <i>Apalone spinifera</i>	S2	On Reservoir and adjacent shoreline areas	Could be impacted if water quality deteriorates	Not likely to be impacted with environmental commitments and land use and natural resource RMP objectives in place
Six-lined racerunner <i>Cnemidophorus sexlineatus</i>	S2	On Reservoir and adjacent shoreline areas	Not expected under current management	Not likely to be impacted with environmental commitments and land use and natural resource RMP objectives in place
Piping plover <i>Charadrius melodus</i>	State threatened	On sparsely vegetated exposed sandy shorelines adjacent to the Reservoir	Not expected under current management	Not likely to be impacted with environmental commitments and land use and natural resource RMP objectives in place

*S1 species are critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction. S2 species are imperiled because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range. S3 species are either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors, in the range of 21 of 100 occurrences. S2B, S3N means S2 rank in breeding season and S3 in nonbreeding season.

Preferred Alternative

There are no anticipated consequences or impacts to State and Federally Protected Species and Species of Special Concern associated with this alternative for all MUs with environmental commitments and land use and natural resource RMP objectives in place.

Cumulative Impacts

Impacts to State and Federally Protected Species and Species and Communities of special concern from the Preferred Alternative would be relatively minor and beneficial. There are no known present or reasonably foreseeable non-Project future actions that would elevate these minor impacts to changes of a greater magnitude.

3.7 Cultural Resources

Affected Environment

Reclamation manages cultural resources at Angostura Reservoir in accordance with Section 110 and Section 106 of the National Historic Preservation Act (NHPA) and other applicable laws and regulations. Under Section 110 of the NHPA, Reclamation has completed cultural resource surveys at Angostura Reservoir and has conducted evaluations to determine what cultural resource sites are eligible for listing on the National Register of Historic Places (NRHP). Sites that are determined to be eligible for listing on the NRHP are given high cultural resource management consideration and status as historic properties. Section 106 of the NHPA requires Reclamation to consider effects to historic properties when planning and implementing actions such as those identified in the RMP.

Angostura Reservoir is in the South Fork Cheyenne Archaeological Region, which is one of 24 management regions designated in the South Dakota State Plan for Archaeological Resources (Winham and Hannus 1991). The majority of the cultural resource sites at Angostura Reservoir are prehistoric artifact scatters. Five different types of prehistoric sites are located there. They include prehistoric occupation sites, lithic scatters, stone circles and rockshelters, historic sites, and sites consisting of the skeletal remains of prey animals.

Occupation sites are scatters of artifacts, bone, pottery shards, and fire-cracked rock. Lithic scatters are distinct accumulations of stone (lithic) tools and/or debris from tool making. Stone circle sites, also called tipi ring sites, are distinguished by one or more circular rings of stone. Rockshelters are rock overhangs with archaeological remains and/or rock art (petroglyphs). The sites consisting of faunal remains lack artifacts, but they appear to be have been made as the result of human activity.

The first cultural resources surveys at Angostura Reservoir were done in the 1940s by the Smithsonian Institution-River Basin Survey (SI-RBS) (Bauxar 1947; Hughes 1949; Wheeler 1995; White and Hughes 1948). Their surveys began in the construction stage of the dam. Some sites are on land that eventually was not acquired by Reclamation.

The SI-RBS surveyors found what became known as the Ray Long Site, named after a local landowner. The Ray Long Site contains concentrations of artifacts which form an archaeological cultural complex called the Angostura Complex. The most notable artifact is a slender, lanceolate-type of projectile point called the Angostura Point. The Ray Long Site consists of a series of small hunting and processing camps dating to the late Pleistocene and early Holocene. The camps are deeply buried on a high terrace that is at the waterline when the reservoir is full.



Figure 6 View of the Ray Long Site and rip-rap placed to protect the site. The rip-rap was installed when the reservoir was low so equipment could work from the shoreline.

Fieldwork on the Ray Long site has been conducted by the Archaeology Laboratory of Augustana College (Augustana College). The focus of recent work by Augustana College has been on landform mapping, environmental, and geomorphological data collection. The site continues to be of archaeological interest because it still contains buried cultural deposits and because of its status as the complex-type site. In 2000 Reclamation did earth work and placed rip rap to protect the site from wave and wind erosion.

(SARC) to revisit all the cultural resource sites found by the SI-RBS; they discovered many more sites. Despite that success, the SARC was not able to find some of the sites that had been previously recorded by the SI-RBS. The construction of the Angostura Dam caused the destruction of many sites, as well as submergence of sites when the reservoir filled.

Reclamation contracted with the South Dakota Archaeological Research Center

Reclamation has conducted NRHP evaluations of Angostura Dam, the irrigation facilities, and the remains of the construction camp and associated buildings. Reclamation and the SHPO have agreed that the dam is eligible because of its exceptional importance to water delivery and the development of irrigation in the region and because it was the first dam to be complete under the Pick-Sloan program. Formal nomination to the NRHP has not been completed.



Figure 7 Photo of the Angostura Dam Construction Camp, 1949.

Reclamation and the SHPO also agree that certain contributing water control facilities and features of the Angostura Irrigation District qualify for inclusion in the NRHP. Reclamation conducted an inventory and evaluation of the Angostura Dam construction camp. The camp was dismantled when the project was completed. There are a few surviving structures that were determined to not be NRHP eligible.

Environmental Consequences

No Action and Preferred Alternatives

Under the NHPA, criteria are used to determine a cultural resource site's NRHP eligibility. In addition, criteria in 36 CFR Part 800 are applied to determine effects to historic properties. Cultural resources determined to not be NRHP eligible are managed to the discretion of Reclamation. In effect they receive less management consideration than historic properties. As stated earlier in this chapter, cultural resource sites that are included in or eligible for listing on the NRHP are given special status as historic properties. The following section lists cultural resource sites in MUs, based on their NRHP eligibility within four categories. These four categories are:

MUs with No Cultural Resource Sites

Cultural resource surveys indicate that there is no cultural resource sites on historic properties in the MUs listed below.

Cabin Area A-MU 7
Marina/Concession Area-MU 4
Picnic Point Day Use Area- MU 5
Cascade Campground- MU 6

Because no cultural resource sites exist in these MUs, there are no impacts to cultural resources.

MUs with Non-NRHP Eligible Cultural Resource Sites

Reclamation has determined the cultural resource sites in the MUs listed below to not be NRHP eligible. The protection and preservation would be to the discretion of Reclamation.

North Entrance Headquarters- MU 1
Cheyenne Campground-MU 2
Turkey Draw-MU 3
Angostura Breaks-MU 8
Hat Creek Campground-MU 9
Horsehead Day Use Area-MU 10
Horsehead Campground-MU 11
South Entrance Day Use Area-MU 12
South Trailer Area- MU 13
Bailey's Lakeside Use Area-MU 16
Shale Banks Day Use Area-MU 14
Horsehead Game Production Area-MU 15
Cheyenne River Natural Area-MU 17

Sheps Canyon Lakeside Use Area-MU 19
Red Canyon-MU 20
Mule Deer Ridge-MU 22
North Day Use Area-MU 23
North Trailer Area-MU 24
Angostura Reservoir-MU 25

Because cultural resource sites in these MUs have been determined to not be NRHP eligible, no historic properties exist in these MUs that would be affected by the activities described in the RMP.

For MUs with Unevaluated Cultural Resource Sites

The preferred treatment of the unevaluated cultural resource sites would be avoidance. However, if avoidance is not possible, the unevaluated sites within the area of potential effect (APE) would be evaluated for eligibility to the NRHP. Reclamation would then consult with the SHPO on the determination of NRHP eligibility and effects in accordance with the NHPA.

Unevaluated sites are in the following MUs:

South Entrance Day Use Area-MU 12
Shale Banks Day Use Area-MU 14
Horsehead Game Production-MU 15
Red Canyon-MU 20
Angostura Reservoir-MU 25

For Management Units with Historic Properties

The preferred treatment of historic properties would be physical avoidance through the planning and design of activities and facilities and/or the avoidance of adverse effects. Reclamation would consult with the SHPO on the determination of effect in accordance with the NHPA if avoidance is not possible. The resolution of adverse effects would be done in consultation with the SHPO and tribes.

Historic properties are in the following MUs:

South Entrance Day Use Area- MU 12
Angostura Dam-MU 21
Horsehead Campground-MU 11
Sheps Canyon Lakeside Use Area- MU 19
Cheyenne River Natural Area- MU 17
Mule Deer Ridge- MU 22
Shale Banks Day Use Area -MU 14

Cumulative Impacts

The proposed management activities would not have any cumulative effects to historic properties.

3.8 Socioeconomic

Affected Environment

The greatest numbers of users of Angostura Reservoir come from the following South Dakota and Nebraska counties: Pennington, Fall River, Custer, Shannon of South Dakota and Sioux and Dawes of Nebraska. Of these six counties, Pennington County and Fall River have the highest number of users. Pennington County communities located in close proximity to the reservoir are Rapid City, Rapid Valley, Green Valley, Box Elder, and Hill City. Fall River County communities located in close proximity to the reservoir are Hot Springs, Edgemont, and Oelrichs. Of the six counties, three experienced population growth and three counties experienced population decline (in the last six years), with Shannon County having the greatest percent increase, but Pennington County has the largest population.

There are a number of industries, business, and services represented throughout the region, including agriculture, transportation and utilities, mining, timber, construction, manufacturing, gaming, tourism, government, and retail.

In 2005, Pennington County had a per capita personal income of \$32,887 and Fall River County had \$27,432. The state average is \$32,523; the national average is \$36,629. Per capita personal income is calculated as the personal income of the residents of an area divided by the population of that area. The large portion of economic benefit in Pennington and Fall River Counties are tourism and recreation followed by governmental services. There is very little industry in Pennington and Fall River Counties. Tourism and recreation are the major economic attractors and contributors in the region. As Black Hills visitation numbers have increased, so have the number of businesses and services.

City and County Data

Rapid City is the second largest city in South Dakota and the county seat for Pennington County. A regional service center, Rapid City has a total population of 62,715, which represents most of the county population. Ellsworth Air Force Base, the South Dakota Army National Guard, and the South Dakota School of Mines and Technology are also located in Rapid City. Both public and private recreation opportunities exist including hunting, fishing, hiking, golfing, and a large number of campgrounds. There are many tourist attractions such as Reptile Gardens, Bear Country USA, Mount Rushmore, and about one-third of the Black Hills National Forest is located within Pennington County.

Hot Springs is the county seat and is the largest city in Fall River County. It has a population of 4,101 people, is surrounded by rugged canyons and pine-covered hills, and is the closest city to Angostura Reservoir. The Veterans Administration Black Hills Medical Center and the State Veterans Home are in Hot Springs. While relying on the tourism industry, the town has a growing artist community. Hot Springs and Fall River County have many attractions for tourists and recreation enthusiasts such as the Mammoth Site, mineral water health spas, Evans Plunge, Wind Cave National Park, a portion of the Black Hills National Forest, Black Hills Wild Horse

Sanctuary, lake resorts, history museums, Southern Hills Golf Course, hotels, shops, and restaurants.

User fees

The entrance and day use fees at Angostura State Park would increase for 2009. Fees in 2008 were Annual Park Entrance \$23.00, Second Vehicle Annual were \$11.50, and Day Use per person were \$3.00 or \$5.00 per vehicle. The new fees in 2009 for Annual Park Entrance would be \$28.00, Second Vehicle Annual \$14.00, and Day Use per person is \$4.00 or \$6.00 per vehicle.

Fees collected by SDGFP go towards the Parks daily operations and provide recreation facilities and opportunities. There is a direct correlation between park use revenue and the water level on the reservoir. Extremely low water levels diminish boating access and extend the distance from developed recreation and support facilities to the water. These conditions lessen the desirability of the recreation area and negatively affect fee revenue that is needed to operate the recreation facilities.

Environmental Consequences

No Action Alternative

The current user fees for Angostura Reservoir would not change under this alternative. While visitors would not have to pay additional fees, they also would not have the additional services that fees provide. There would be no new jobs created relating to new development.

Preferred Alternative

This alternative would have a positive impact on the surrounding communities because there would be some development, which could mean jobs for people and more recreation facilities for the public to use. There would be a negative financial impact to the users that used the free areas with proposed user fees. However, the positive impact would be increased recreation facilities in fee areas due to revenues.

4 Consultation and Coordination

4.1 Public Involvement

Reclamation began the public scoping process for the Angostura RMP in April 2007. Part of the process included open houses which were held in Rapid City and Hot Springs, South Dakota and Chadron, Nebraska. Public comments were gathered to identify issues and opportunities at Angostura Reservoir. The public scoping period ended June 1, 2007. RMP team members summarized comments and worked with the focus group members to develop alternatives.

A focus group was formed in the fall of 2007 to assist with addressing issues, develop goals, objectives, draft alternatives, and review comments from open houses. The focus group members had a wide range of interest from the surrounding area. The members represented various groups such as adjacent landowners, the District, Fall River County, cabin and trailer owners, camping, anglers, concessions, and general recreation (e.g. boating, sailing, sporting clubs). The focus group met six times from 2007 to 2008.

A second set of open houses were held in July 2008 to present the draft alternatives and gather comments. A website was made available for the public to review all associated documents with the EA process. Plus, three newsletters have been distributed to inform the public about the NEPA process and present the draft alternatives.

The 30 day public comment period ended for the draft EA, in May of 2009. A total of six comments were received from the public. Responses to those comments can be found in Appendix C.

4.2 Consultation

The USFWS South Dakota Field Office website was reviewed and no federally listed species were listed for Fall River County. The South Dakota Field Office was contacted by telephone and confirmed their website information and related that they would review this EA in regard to any further consultation.

Reclamation notified the tribes about the preparation of the RMP and initiated consultation to determine concerns. Reclamation also notified the SHPO about the preparation of this document. Consultation with the tribes and SHPO would be conducted prior to the implementation of proposed management activities.

Distribution List

Scoping letters and newsletters were sent to the following federal and state agencies, tribes and tribal organizations, elected officials, and organizations. They were also mailed to approximately 500 individuals, grazing lessees and adjacent landowners.

Federal

Fish and Wildlife Service
United States Geologic Survey
Bureau of Land Management
Army Corps of Engineers
Natural Resources Conservation Service
Forest Service
Department of Agriculture Farm Service

Tribal

Mni Sose Intertribal Water Rights Coalition
Black Hills Sioux Nation Treaty Council
Lower Brule Sioux Tribe, Chairman
Cheyenne River Sioux Tribe, Chairman
Cheyenne River Sioux Tribe, Tribal
Archaeologist
Crow Creek Sioux Tribe, Chairperson
Standing Rock Sioux Tribe, Chairman
Standing Rock Sioux Tribe, Tribal Historic
Preservation Officer
Oglala Sioux Tribe, President
Rosebud Sioux Tribe, President
Rosebud Sioux Tribe, Tribal Historic
Preservation Officer
Three Affiliated Tribe

State

South Dakota Department of Game, Fish
and Parks
South Dakota Department of Environment
and Natural Resources
South Dakota Department of Tourism
South Dakota State Historic Preservation
Officer
South Dakota Department of Transportation

Elected Officials

South Dakota Governor
U.S. Senators
U.S. Congressman
South Dakota State Representatives
South Dakota State Senators
Mayor, Fruitdale
Town President, Nisland
Mayor, Newell
Mayor, Belle Fourche
Butte County Sheriff

Fall River County Commissioners
Custer County Commissioners
Pennington County Commissioners
Shannon County Commissioners
Mayor, Hot Springs
Mayor, Custer
Mayor, Edgemont
Mayor, Rapid City
Mayor, Hill City
Mayor, Lead
Mayor, Deadwood
Mayor, Sturgis
Mayor, Spearfish
Mayor, Belle Fourche
Mayor, Box Elder

Organizations

Black Hills Badlands and Lakes Association
Deadwood Chamber of Commerce
Black Hills Fly Fishers
South Dakota Chapter of the Wildlife
Society
Lead Chamber of Commerce
Meade County Commissioners
Newell Community Club
Rapid City Chamber of Commerce
Dakota Chapter of the American Fisheries
Society
Spearfish Chamber of Commerce
Chadron Chamber of Commerce
Newcastle Chamber of Commerce
Custer Chamber of Commerce
Town of Buffalo Gap
City of Edgemont
Northern Hills Journal
Spearfish Economic Development
Corporation
Sturgis Chamber of Commerce
Rocky Mountain Elk Foundation
Fall River County Weed & Pest
Custer County Weed & Pest
Pennington County Weed & Pest
Shannon County Weed & Pest
Native Ecosystems Council
National Wild Turkey Federation
Biodiversity Conservation Alliance
Defenders of the Black Hills

Black Hills Disc Golf Confederacy
Prairie Hills Audubon Society
Nature Conservancy
Black Hills Bass Bandits
South Dakota Walleyes Unlimited
Fairburn Town Board
City of Oelrichs
City of Gordon
City of Hill City
Rapid City Public Library
Hot Springs Public Library
Chadron Public Library
Rushville Chamber of Commerce
Crawford Chamber of Commerce
City of Alliance
Hay Springs Chamber of Commerce
Four Seasons Sports Center
Custer County Planning & Economic Development

5 Compliance with Environmental Statutes, Laws, Regulations, and Policies

The Preferred Action Alternative would be implemented in accordance and compliance with the following federal environmental laws, regulations, and directives. All permits and necessary authorizations would be obtained prior to construction.

- American Indian Religious Freedom Act of 1978 (P.L. 95-341)
- National Historic Preservation Act of 1966 (P.L. 89-665), as Amended 1992 (P.L. 102-575)
- Native American Graves Protection and Repatriation Act (P.L. 101-601)
- Archaeological and Historic Preservation Act (P.L. 93-291)
- Archeological Resources Protection Act of 1979 (P.L. 96-95)
- National Environmental Policy Act of 1969 (42 USC 4321)
- Clean Air Act (33 USC 7401) and Amendments
- Clean Water Act (33 USC 1251 et seq.), Sections 401, 402, and 404
- Safe Drinking Water Act (42 USC 300f)
- Endangered Species Act of 1973 (P.L. 93-205)
- Farmland Protection Policy Act (P.L. 97-98)
- Fish and Wildlife Coordination Act of 1958 (PL 85-624)
- Indian Trust Responsibilities (512 DM Chapter 2)
- Federal Energy Policy Act of 2005
- Executive Order 11988 - Floodplain Management (1977)
- Executive Order 11990 - Protection of Wetlands (1977)
- Executive Order 12898 - Environmental Justice (1994)
- Executive Order 13007 - Indian Sacred Sites (1996)
- Executive Order 11593 - Protection and Enhancement of the Cultural Environment (1971).
- Executive Order 13186- Protection of Migratory Birds (2001)
- Executive Order 13112 signed by President William Clinton on February 3, 1999.
- Executive Order 13186, Responsibilities of Federal Agencies To Protect Migratory Birds in furtherance of the purposes of the migratory bird conventions
- Migratory Bird Treaty Act (16 U.S.C. 703-711)
- Bald and Golden Eagle Protection Acts (16 U.S.C. 668-668d)
- Fish and Wildlife Coordination Act (16 U.S.C. 661-666c)
- Endangered Species Act of 1973 (16 U.S.C. 1531-1544)
- National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347)

In addition to environmental statutes listed above all changes, new developments, and other work initiated under the terms of the RMP would be completed in full compliance with all applicable state, federal laws, and executive orders.

List of Preparers

Tara Piper, Natural Resource Specialist
Faye Streier, Natural Resource Specialist
Nell McPhillips, Natural Resource Specialist
James Kangas, Archeologist
Scott Hettinger, Recreation Specialist
Ryan Alcorn, Natural Resource Specialist

6 References Sited

- APLIC 2006. *Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006*. Avian Power Line Interaction Committee, Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. Sacramento, CA, or similar standards will be used to the extent practicable.
- Barbour, R. W. 1971. *Amphibians and Reptiles of Kentucky*. Univ. Press of Kentucky. Lexington. X+334p. (cited from <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Aspidoscelis+Sex+lineata> accessed 30 April 2008)
- Bauxar, J. J., 1947. *Preliminary Appraisal of the Archeological and Paleontological Resources of Angostura Reservoir, Fall River County, South Dakota*. Ms. on file, South Dakota State Archaeological Research Center. Rapid City.
- Behler, J.L. and King, F.W. 1979. *The Audubon Society field guide to North American reptiles and amphibians*. Alfred A. Knopf, New York. 719pp. (cited from <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Aspidoscelis+Sex+lineata> accessed 30 April 2008)
- Bell, Gorden L., Jr., 1995. *Assessment of a Fossil on Reclamation-Administered Lands at Angostura Reservoir, Fall River County, South Dakota*. Museum of Geology, South Dakota School of Mines and Technology, Rapid City. Report on file, Dakotas Area Office, Bureau of Reclamation, Bismarck ND.
- Bell, Gorden L., Jr., 1995a. *An Assessment of the Paleontological Resources on Reclamation-Administered Lands at Angostura Reservoir, Fall River County, South Dakota*. Museum of Geology, South Dakota School of Mines and Technology, Rapid City. Report on file, Dakotas Area Office, Bureau of Reclamation, Bismarck ND.
- Bell, Gorden L., Jr., 1997. *A Report of the Excavation of Two Fossil Vertebrates on Bureau of Reclamation-Administered Lands at Angostura Reservoir, Fall River County, South Dakota*. Museum of Geology, South Dakota School of Mines and Technology, Rapid City. Report on file, Dakotas Area Office, Bureau of Reclamation, Bismarck ND.
- Bureau of Reclamation, 1996. *Angostura Resource Appraisal Study Report*. Dakotas Area Office and Denver Technical Service Center.
- Bureau of Reclamation. 1999. *Water Quality and Sediment in the Cheyenne River Basin in Relation to the Angostura Contract Renewals*.

- Bureau of Reclamation, 2002. *Angostura Unit Contract Negotiation and Water Management Final Environmental Impact Statement*. Dakotas Area Office.
- Bureau of Reclamation. 2005. *Angostura Reservoir 2004 Sedimentation Survey*. Denver, Colorado.
- Collins, J.T. 1982. *Amphibians and reptiles in Kansas*. Second edition. Univ. Kansas Mus. Nat. Hist. Pub. Ed. Ser. 8. xiii+356pp. (cited from <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Aspidoscelis+Sex+lineata> accessed 30 April 2008)
- Chippis S.R. and Selch T.M. 2005. *Nutrient Dynamics, Algal Biomass, and Factors Affecting Water Clarity in Angostura Reservoir, South Dakota*. USGS Cooperative Fish and Wildlife Research Unit, South Dakota State University. Brookings, South Dakota.
- Duehr, J.P. 2004. *Fish and Habitat Relations at Multiple Spatial Scales in Cheyenne River Basin*. Master's thesis. South Dakota State University, Brookings, South Dakota.
- EPA. 2005. *The Ecoregion Mapping Products and Ecoregion Descriptions Were Completed in Collaboration with the U.S. EPA Regional Offices, State Resource Management Agencies and with Other Federal Agencies*. Online: http://epa.gov/wed/pages/ecoregions/level_iii.htm
- Greene, E.A., Sowards C.L., and Hansmann E.W. 1990. *Reconnaissance Investigation of Water Quality, Bottom Sediment, and Biota Associated with Irrigation Drainage in the Angostura Reclamation Unit, Southwestern South Dakota, 1988-1989*. Water Resources Investigations Report 90-4152.
- Greis, John P., 1996. *The Roadside Geology of South Dakota*. Missoula, MT: Mountain Press Publishing Company.
- 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, SD. 278pp.
- Hoagstrom, C.W., S.S. Wall, J. P. Duehr, and C.R. Berry. 2006. *River Size and Fish Assemblages in Southwestern South Dakota*. South Dakota Great Plains Research 16:117-26.
- Hoagstrom, C. W., DeWitte, C. A., Gosch, H. J. C., Berry, C. R. Jr., 2007. *Historical Fish Assemblage Flux in the Cheyenne River below Angostura Dam*. South Dakota State University, Brookings, South Dakota.
- Hughes, J. T. "Investigations in Western South Dakota and Northwestern Wyoming". *American Antiquity* (1949) 14:266-277.
- Krantz E. and Larson A. 2006. *Upper Cheyenne Watershed Assessment Draft Final Report*, Fall River, Custer, and Pennington Counties, South Dakota.

- Meester, R. J. 2000. *Statewide fisheries survey, 1999 surveys of public waters*. South Dakota Department of Game, Fish and Parks, Fisheries Division Report No. 00-18, Pierre.
- Mount, R.H. 1975. *The reptiles and amphibians of Alabama*. Auburn University Ag. Exp. Station, Auburn, AL. vii+347p. (cited from <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Aspidoscelis+Sex+lineata> accessed 30 April 2008)
- North Wind, Inc, 2007. *Rangeland and Riparian Health Assessments for Angostura Reservoir*. Idaho Falls, Idaho.
- Omernik, J.M. 1987. *Ecoregions of the conterminous United States*. Annals of the Association of American Geographers. 77:118-125
- Pellant, M., P. Shaver, D.A. Pyke, and J.E. Herrick. 2005. *Interpreting indicators of rangeland health, version 4*. Technical Reference 1734-6. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO. BLM/WO/ST-00/001+1734/REV05. 122 pp. (available online at www.blm.gov/nstc/library/techref.htm).
- Peterson, Richard A. 1995. *The South Dakota breeding bird atlas*. South Dakota Ornithologists' Union. Jamestown, ND: Northern Prairie Wildlife Research Center Online. <http://www.npwrc.usgs.gov/resource/birds/sdatlas/index.htm> (Version 06JUL2000).
- Pick, T., P. Husby, W. Kellogg, B. Leinard, and R. Apfelbeck. 2004. *Riparian Assessment: Using the NRCS Riparian Assessment Method*. U.S. Department of Agriculture, Natural Resources Conservation Service, Bozeman, MT. 33 pp. (available online at <ftp://ftp-fc.sc.egov.usda.gov/MT/www/technical/environment/envtechnoteMT2.pdf>).
- Sando S.K., Williamson J.E., Dickerson K.K., Wesolowski E. A. 2001. *Irrigation Drainage Studies of the Angostura Reclamation Unit and the Belle Fourche Reclamation Project, Western South Dakota: Results of 1994 Sampling and Comparisons with 1988 Data*. Water Resources Investigations Report 01-4103. U.S. Geological Survey. Rapid City, South Dakota.
- South Dakota Department of Environment and Natural Resources. 2008. *Integrated Report for Surface Water Quality Assessment*. Pierre, South Dakota.
- South Dakota Department of Game, Fish and Parks, 1992. *Angostura State Recreation Area Master Plan*. Division of Parks and Recreation, Pierre, South Dakota.

- South Dakota Department of Game, Fish and Parks, 1994. *Environmental Assessment, Angostura State Recreation Area Master Plan*. Division of Parks and Recreation, Pierre, South Dakota.
- South Dakota Department of Game, Fish and Parks, 2002. *South Dakota Statewide comprehensive Outdoor Recreation Plan*. Department of Parks and Recreation, Pierre, South Dakota.
- South Dakota Department of Game, Fish and Parks, 2001, 2002, 2003, 2004, 2005, 2006, 2007. *SD Game, Fish & Parks BOR Annual Operations, Maintenance and Development Report*.
- South Dakota Department of Game, Fish and Parks – Doug Backlund, Personal Communication.
- South Dakota Department of Transportation, 2007. *Draft Environmental Assessment Fall River County US 18 from Oelrichs to the Smithwick road Grading to Construct and Surface Two Additional Lanes*. Office of Project Development, Pierre, South Dakota.
- Thompson, Ida, 1982. *National Audubon Society Field Guide to North American Fossils*. New York: Alfred A. Knopf.
- U.S.D.A. Soil Conservation Service, 1982. *Soil Survey of Fall River County South Dakota*. Prepared by John Kalveis, United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with the South Dakota Agricultural Experiment Station.
- U.S. Department of Commerce, 2000. *American Fact Finder*. Bureau of Census, Washington D.C.
- U.S. Department of Commerce, 2005. *Small Area Income & Poverty Estimates*. Bureau of Census, Washington D.C.
- U.S. Department of the Interior, 2003. *American Indian Population and Labor Force Report*. Bureau of Indian Affairs, Office of Tribal Services.
- U.S. Geological Survey. 2000. *Angostura Unit Water Quality, Historical Perspectives for Future Research*. Columbia Environmental Research Center. Columbia, Missouri.
- Wheeler, R. P., 1995. *Archaeological Remains in Three Reservoir Areas in South Dakota and Wyoming. Part I: Archeological Remains in the Angostura Reservoir Area, South Dakota*. J. L. Reprints in Anthropology, Vol. 46. Lincoln NE.
- White, T. E. and J. T. Hughes. 1948. *A Preliminary Appraisal of the Physiographic History of Horsehead Creek in the Vicinity of 39FA65*. Ms. on file, South Dakota State Archaeological Research Center. Rapid City.

Winham, R. P. and L. A. Hannus, 1991. *South Dakota State Plan for Archaeological Resources: Introduction and Overview to Historic Contexts and Archaeological Management Regions for Research Planning*. Manuscript of file South Dakota State Archaeological Research Center. Rapid City.

7 Appendices

Appendix A. Objectives

Land Use Management (LUM)

Objective LUM 1.1: Grazing Plan would be used as a management tool.

Objective LUM 1.2: Ensure protection of the public facilities, and public resource values on Reclamation lands and alleviate conflicts with adjacent lands.

Objective LUM 1.3: Develop and implement a Fire Management Plan to address public safety related concerns, as well as efforts that would enhance the natural resource values of the land.

Objective LUM 1.4: Address existing trespass/encroachments on Reclamation lands.

Objective LUM 1.5: Ensure that design and location of all new facilities, structures, roads, and trails on Reclamation lands maximize compatibility and integration with the open, rural environment and historic landscape of area.

Objective LUM 1.6: Minimize impacts on adjacent/surrounding lands resulting from land disturbing activities undertaken on Reclamation lands.

Natural Resources (NAT)

Objective NAT 1.1: Provide hunting opportunities consistent with GF&P mission and management.

Objective NAT 1.2: Continue to provide access for hunting area as per state rules and regulations.

Objective NAT 1.3: Protect and enhance wildlife habitat.

Objective NAT 1.4: Minimize the potential for pollutants to enter the Angostura Reservoir and its tributaries from Reclamation lands.

Objective NAT 1.5: Manage shoreline areas to protect habitat for waterfowl and other migratory birds.

Objective NAT 1.6: Protect, enhance, and/or restore wetland and riparian habitats in accordance with existing Federal Regulations and consistent with RMP.

Objective NAT 1.7: Protect and enhance the quality of the fishery at Angostura Reservoir.

Objective NAT 1.8: Enhance shoreline fishing opportunities and associated parking.

Objective NAT 1.9: Avoid or minimize impacts of RMP actions on Federal and State designated species of special concern, including Federally listed rare, threatened or endangered.

Objective NAT 1.10: Protect and enhance resource values of and for native species (plants and animals) on parcels or portions of parcels exhibiting mainly high quality habitat (where native vegetation is dominant).

Objective NAT 1.11: Conserve and restore pockets of native vegetation on portions of larger parcels exhibiting mainly non-native vegetation.

Objective NAT 1.12: Control soil erosion in priority areas where it causes concern for water quality and damage to resources and facilities.

Objective NAT 1.13: Provide information to reduce the spread of noxious weeds through a variety of mediums.

Objective NAT 1.14: Provide opportunities for public education on area prehistory and history, including the importance of, and requirements for, protecting these resources.

Recreation and Access (REC)

Objective REC 1.1: Provide quality camping opportunities by improving and/or expanding existing sites and developing new sites.

Objective REC 1.2: Provide quality day use sites and facilities to meet increasing demands while providing a buffer from adjacent uses (e.g. campgrounds).

Objective REC 1.3: Improve boat launch ramps and reduce peak period congestion.

Objective REC 1.4: Reduce conflicts between motorized and non-motorized water crafts.

Objective REC 1.5: Achieve needed enforcement of rules and regulations, and protection of public health and safety.

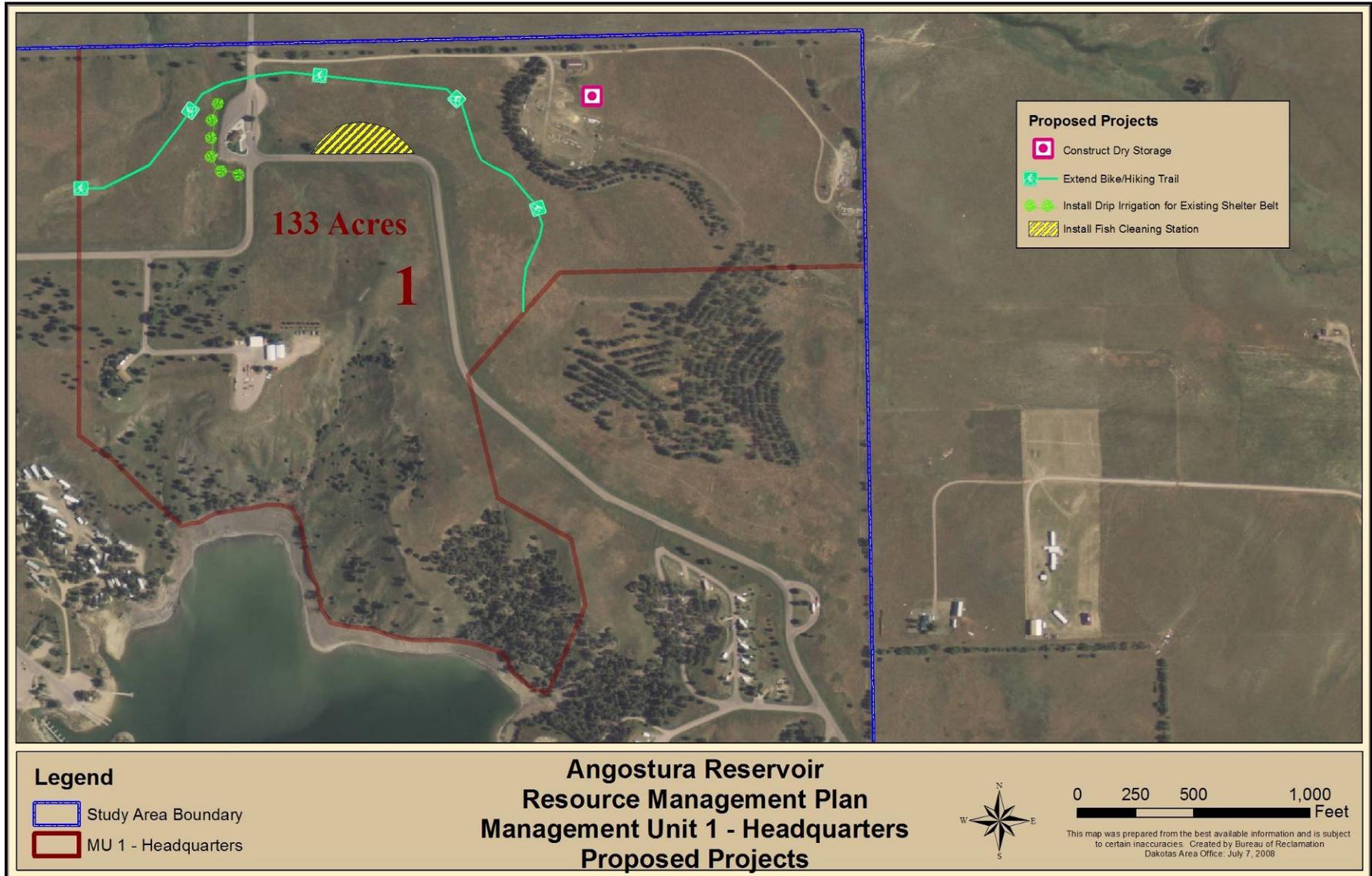
- Objective REC 1.6: Address and resolve unauthorized access-related conflicts pertaining to Reclamation lands.
- Objective REC 1.7: Using Reclamation's sign manual develop clear, consistent signage to guide public access to and the use of Reclamation lands.
- Objective REC 1.8: Maintain the existing primitive and developed recreation setting and experience, while providing for recreation opportunities and the continued protection of natural and cultural resources.
- Objective REC 1.9: Provide adequate sanitation and waste management facilities at all improved recreation sites (e.g., restrooms, trash containers, RV and boat dump stations, fish cleaning stations, as appropriate) to protect water quality.
- Objective REC 1.10: Implement ADA design standards for any new structures and retrofit.
- Objective REC 1.11: Provide adequate shoreline and water-based facilities to support the demand for boating and other water-based uses.
- Objective REC 1.12: Enforce existing Off Road Vehicle regulations, restricting vehicle use to designated roads only.
- Objective REC 1.13: Provide expanded opportunities for hiking, bicycling, and trails around Angostura Reservoir.

Cultural Resources (CR)

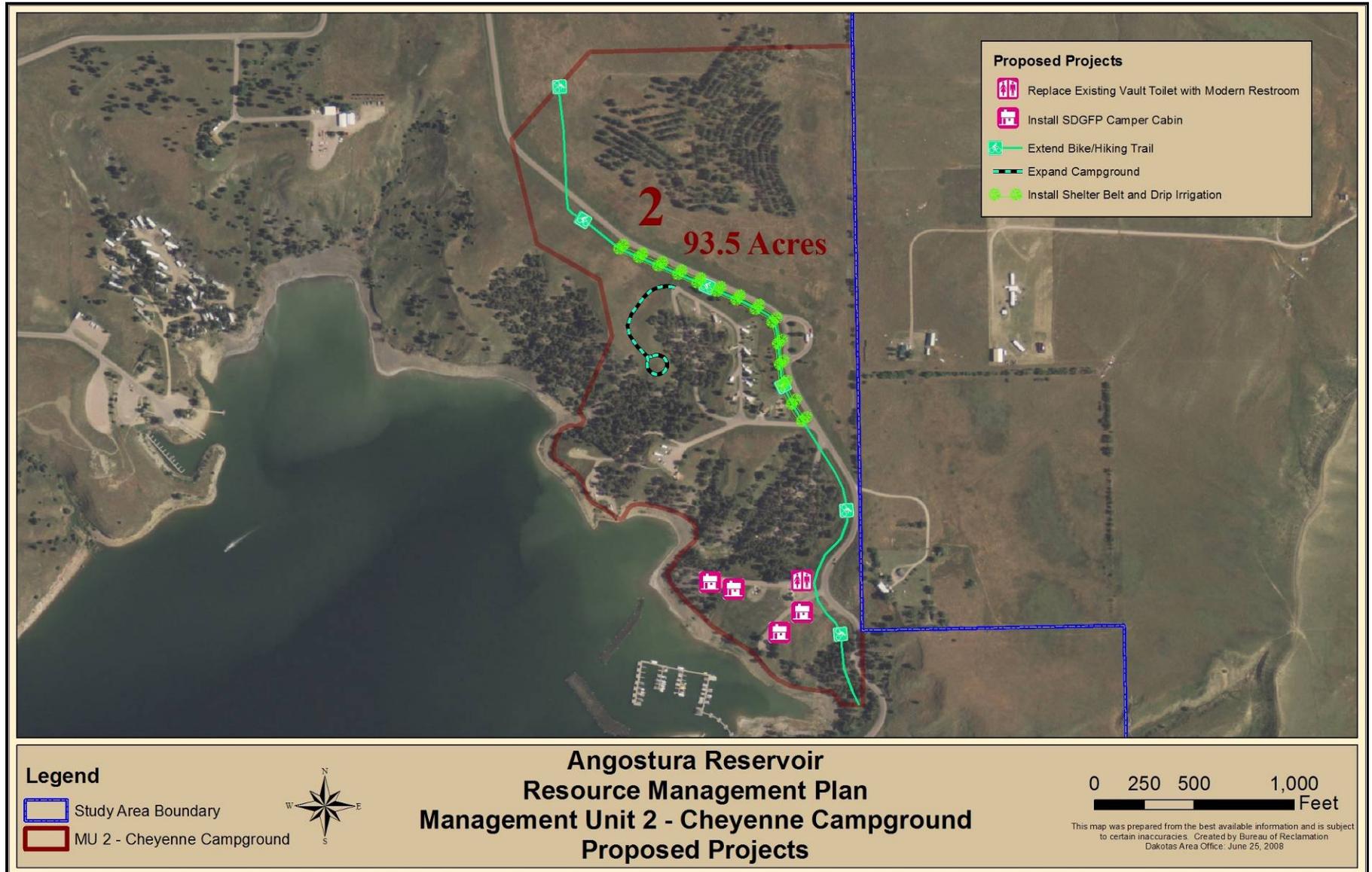
- Objective CR 1.1: In accordance with Section 106 of the National Historic Preservation Act (NHPA) seek to protect National Register-eligible sites from impacts from new undertakings.
- Objective CR 1.2: In accordance with Section 110 of NHPA, implement proactive management of cultural resources focusing on protecting identified resources from damage.
- Objective CR 1.3: Provide interpretive information at public access areas.
- Objective CR 1.4: Protect Indian Trust Assets that may exist.

Appendix B. Proposed Project Maps

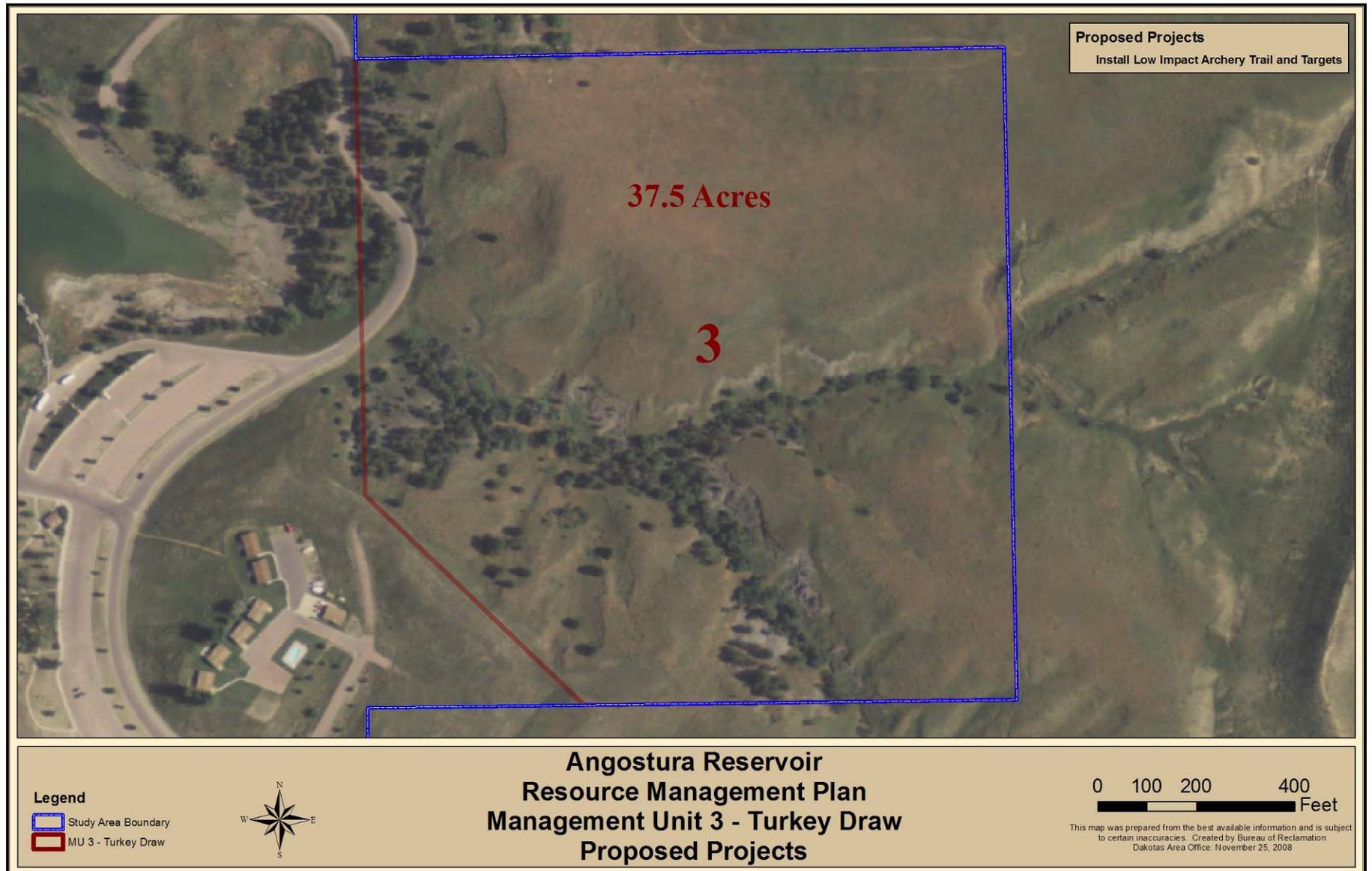
Map 7-1, MU 1 - Headquarters



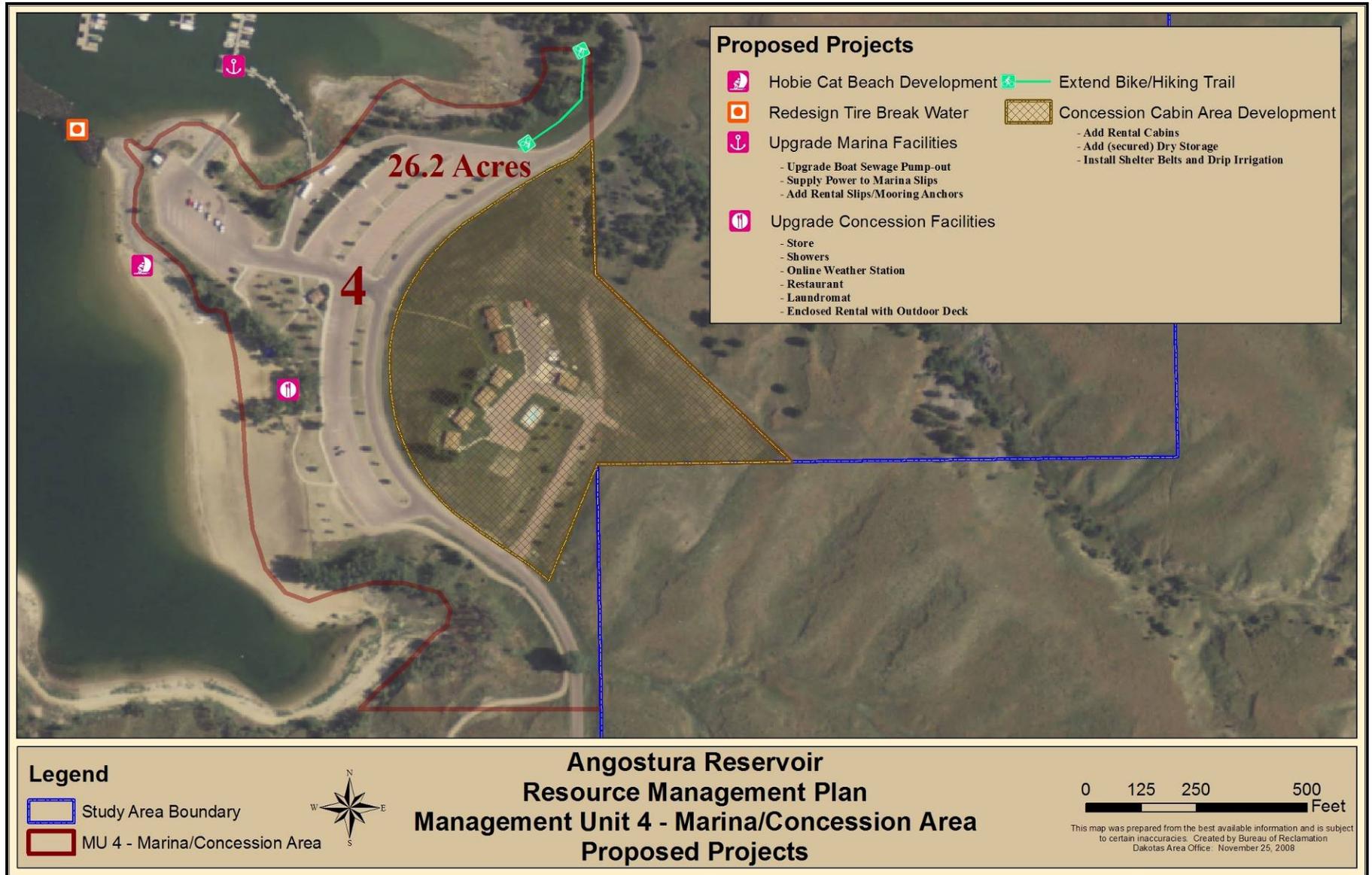
Map 7-2, MU 2 – Cheyenne Campground



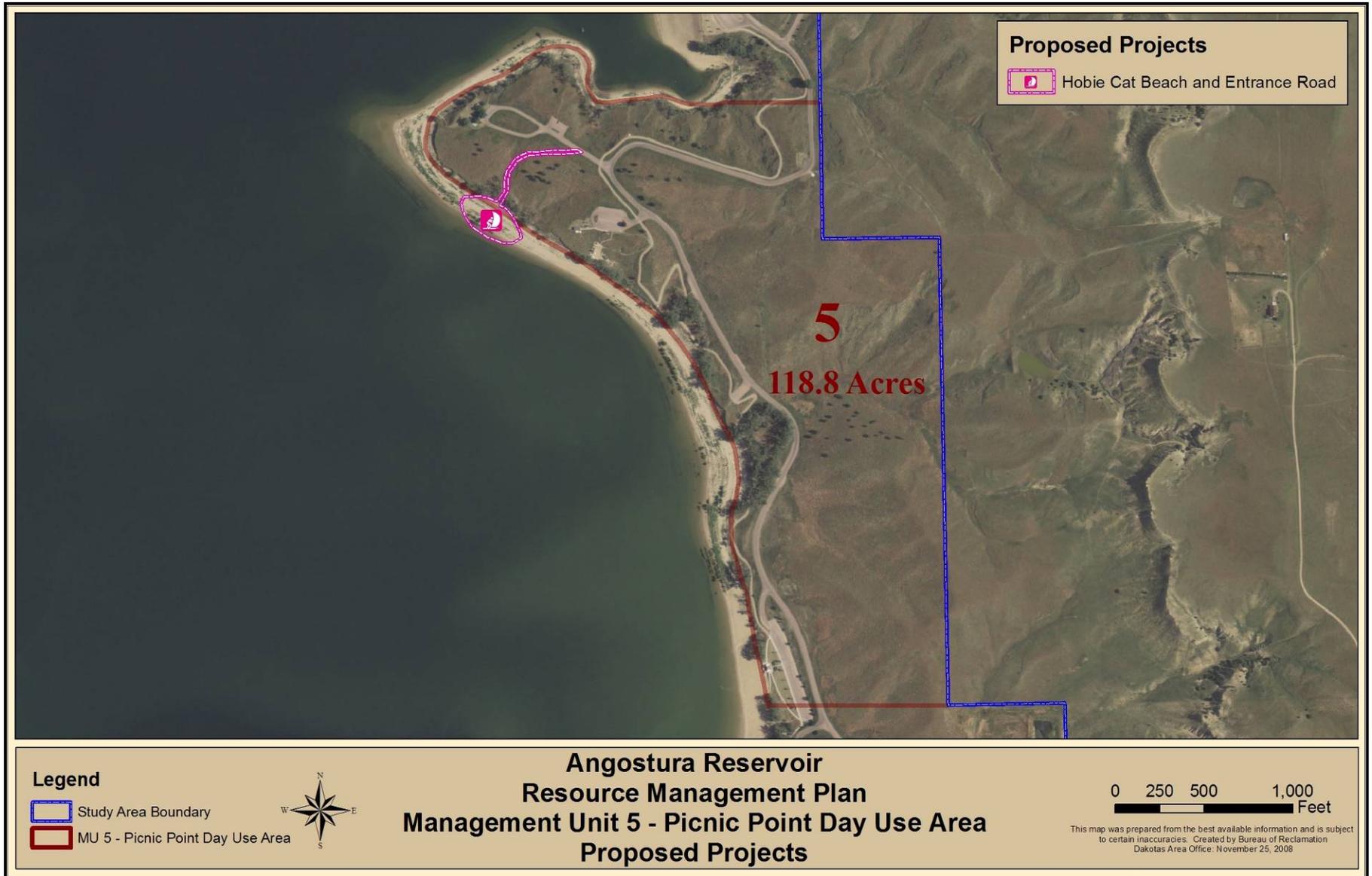
Map 7-3, MU 3 – Turkey Draw



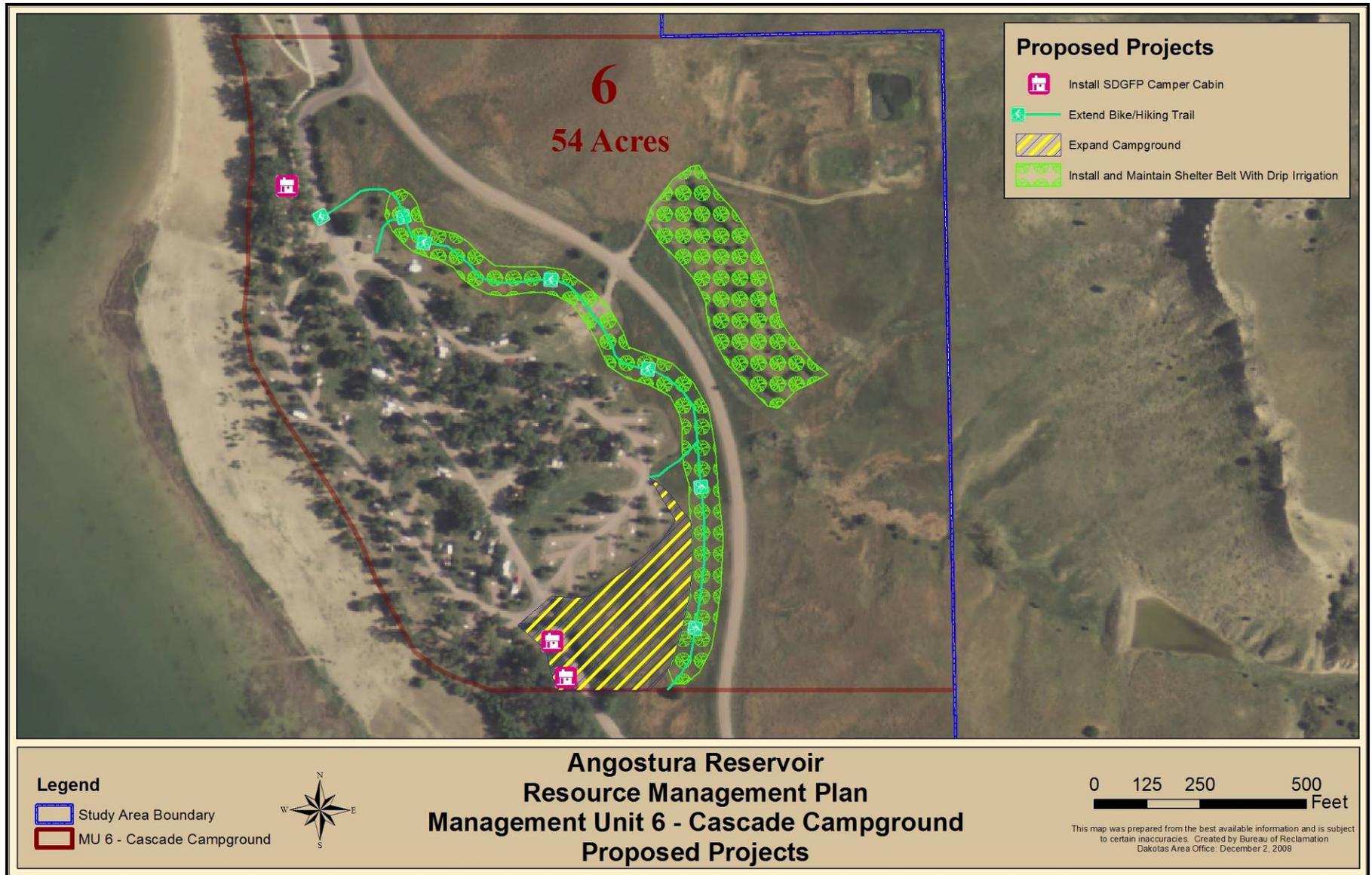
Map 7-4, MU 4 – Marina/Concession Area



Map 7-5, MU 5 – Picnic Point Day Use Area



Map 7-6, MU 6 – Cascade Campground



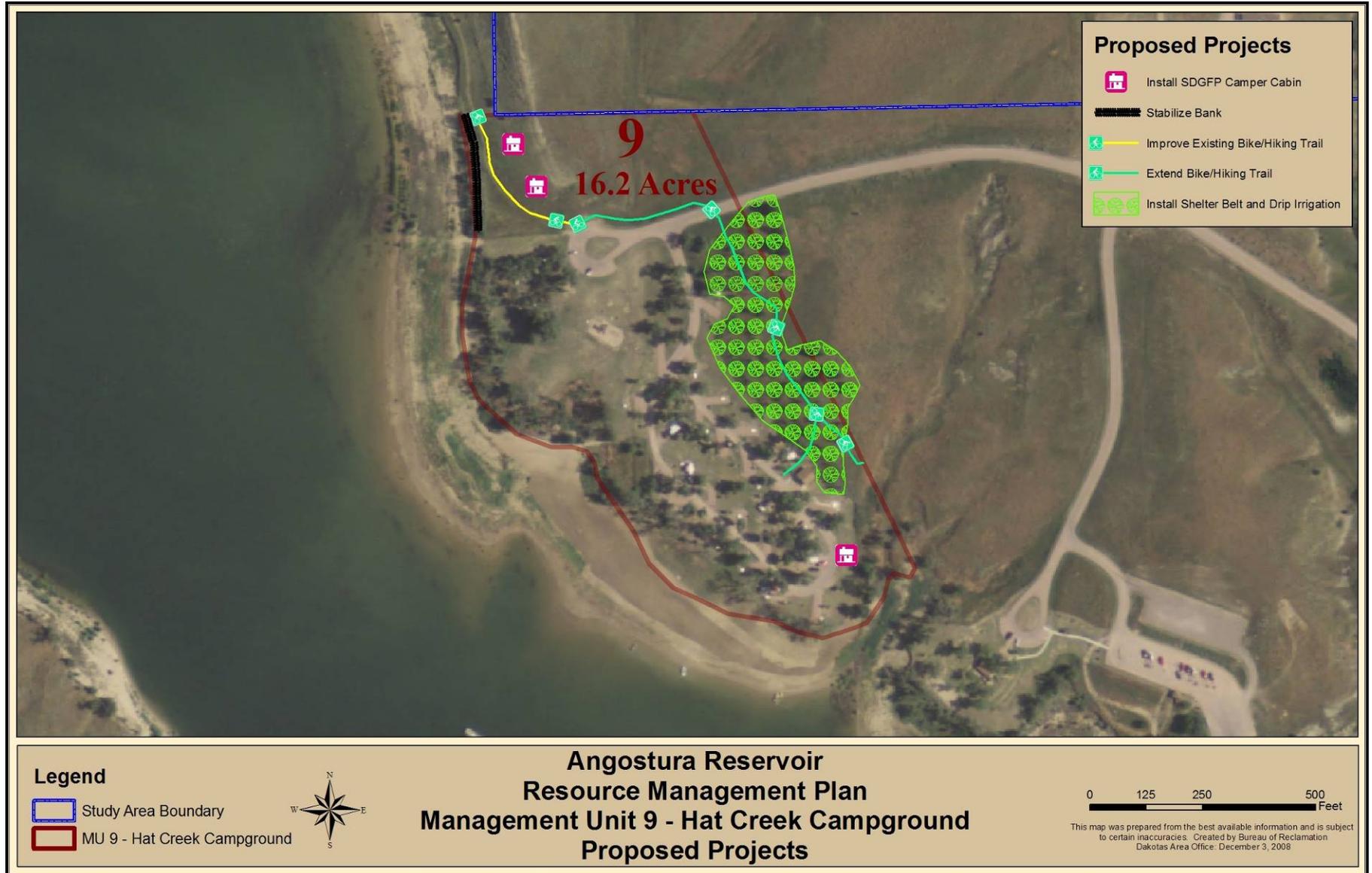
Map 7-7, MU 7 – Cabin Area A



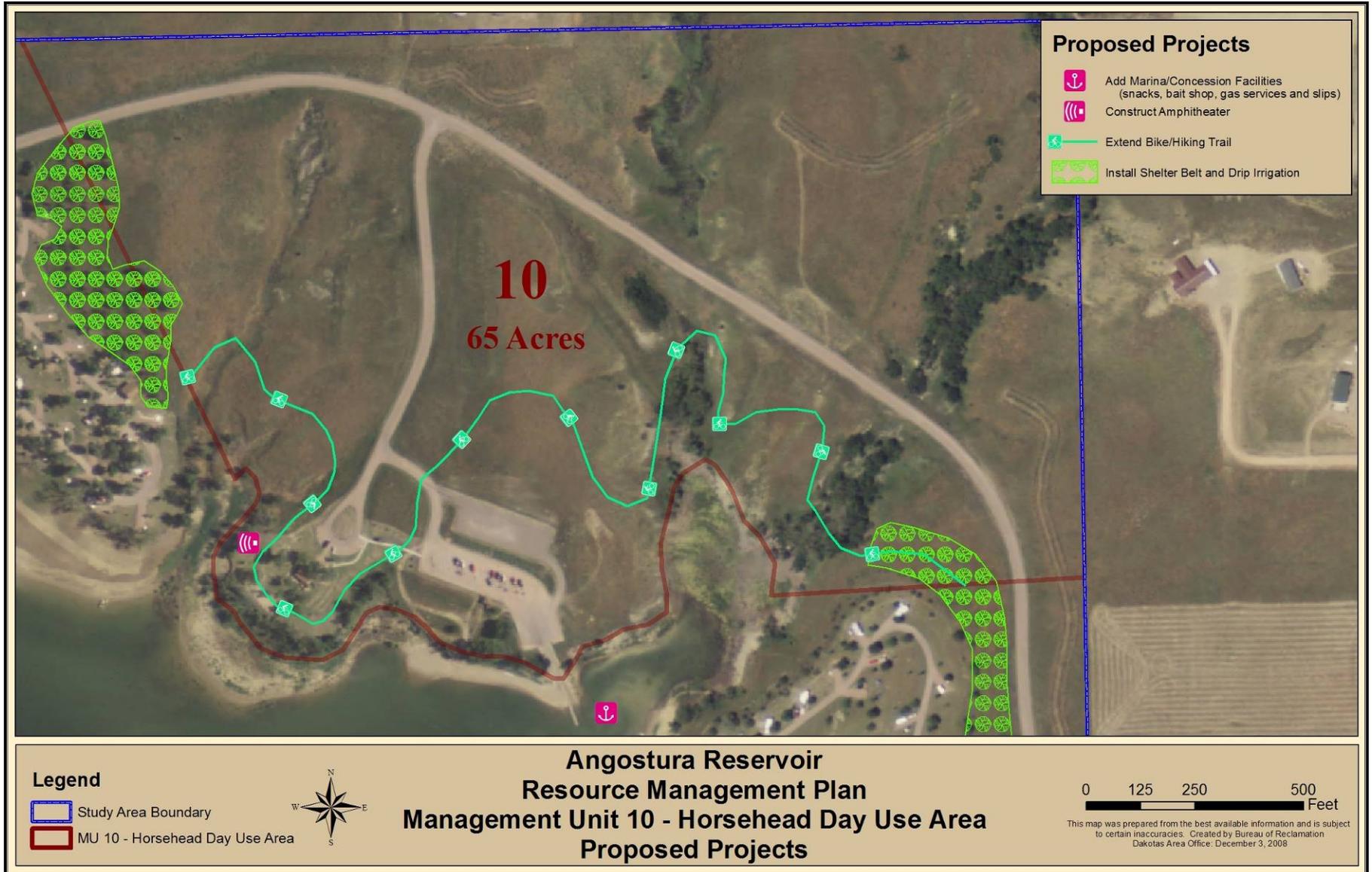
Map 7-8, MU 8 – Angostura Breaks



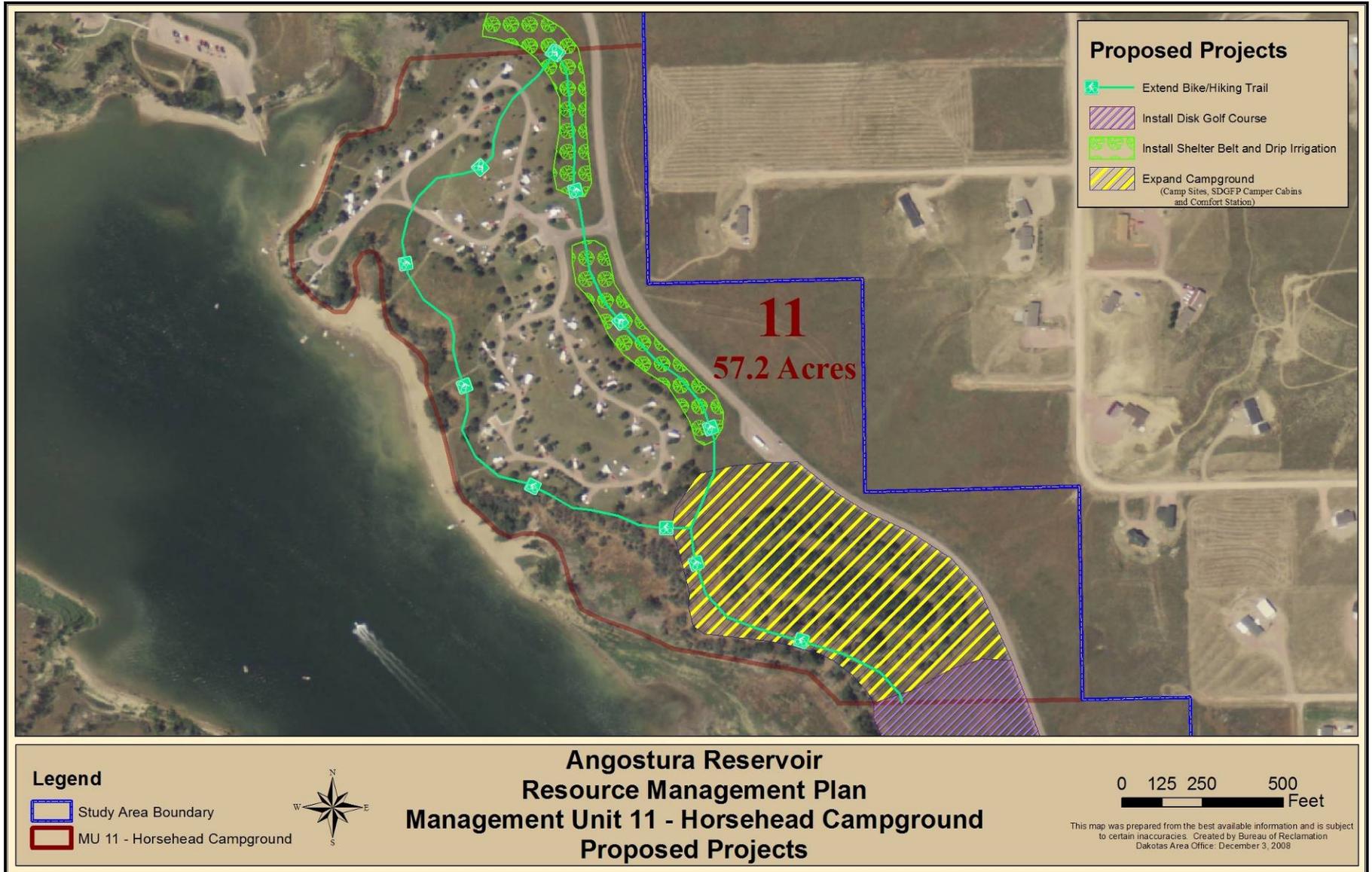
Map 7-9, MU 9 – Hat Creek Campground



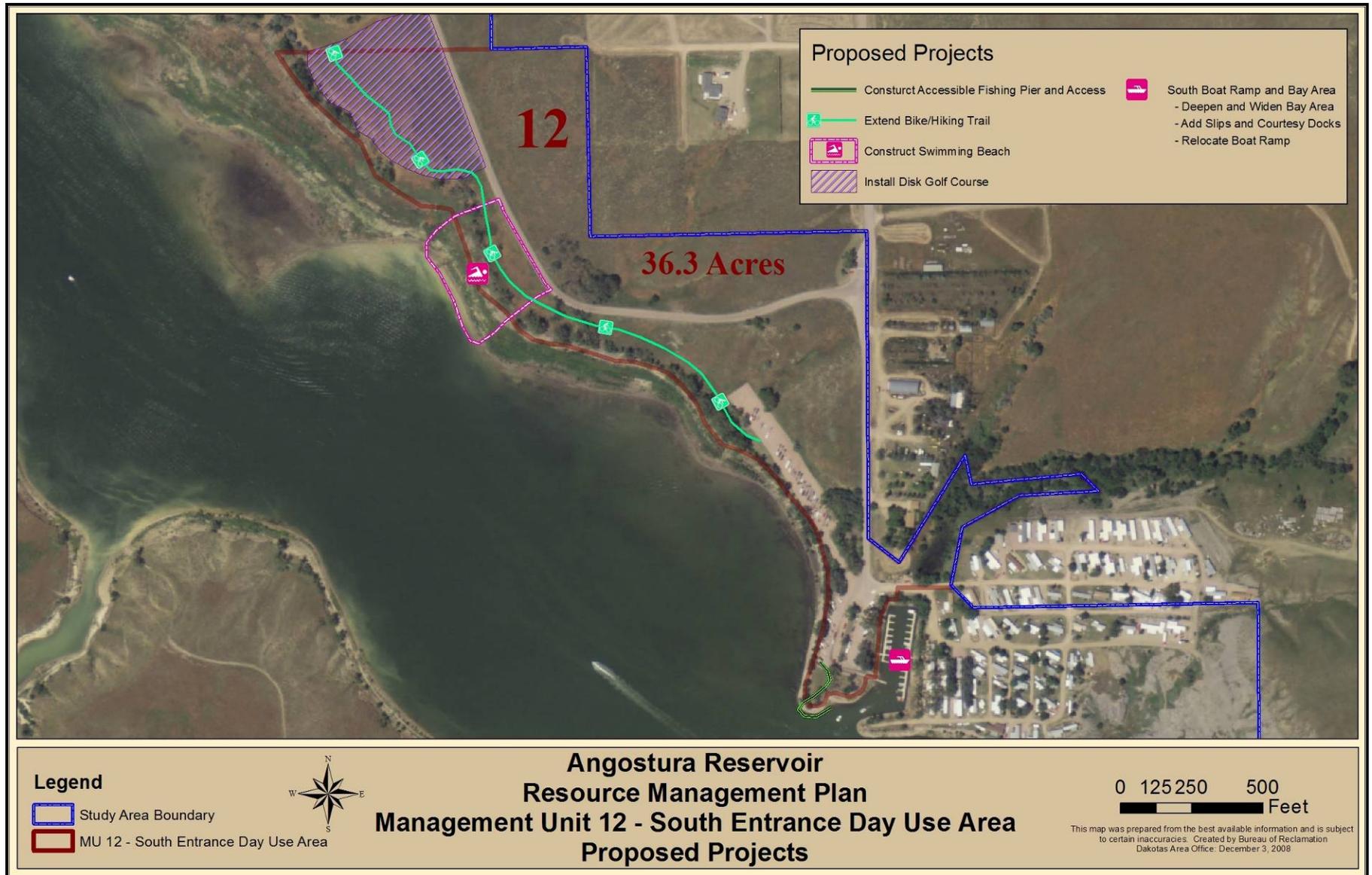
Map 7-10, MU 10 – Horsehead Day Use Area



Map 7-11, MU 11 – Horsehead Campground



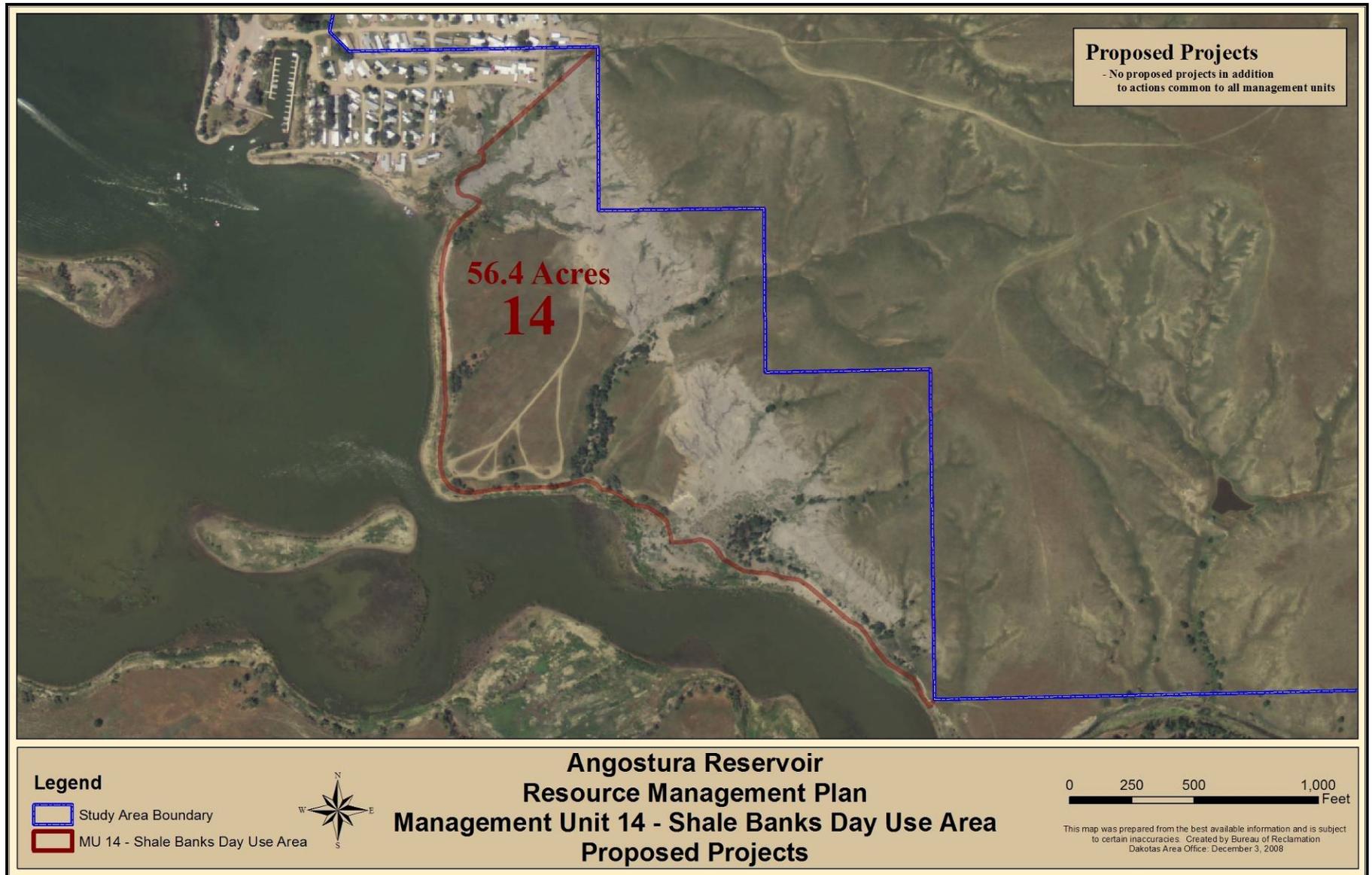
Map 7-12, MU 12 – South Entrance Day Use Area



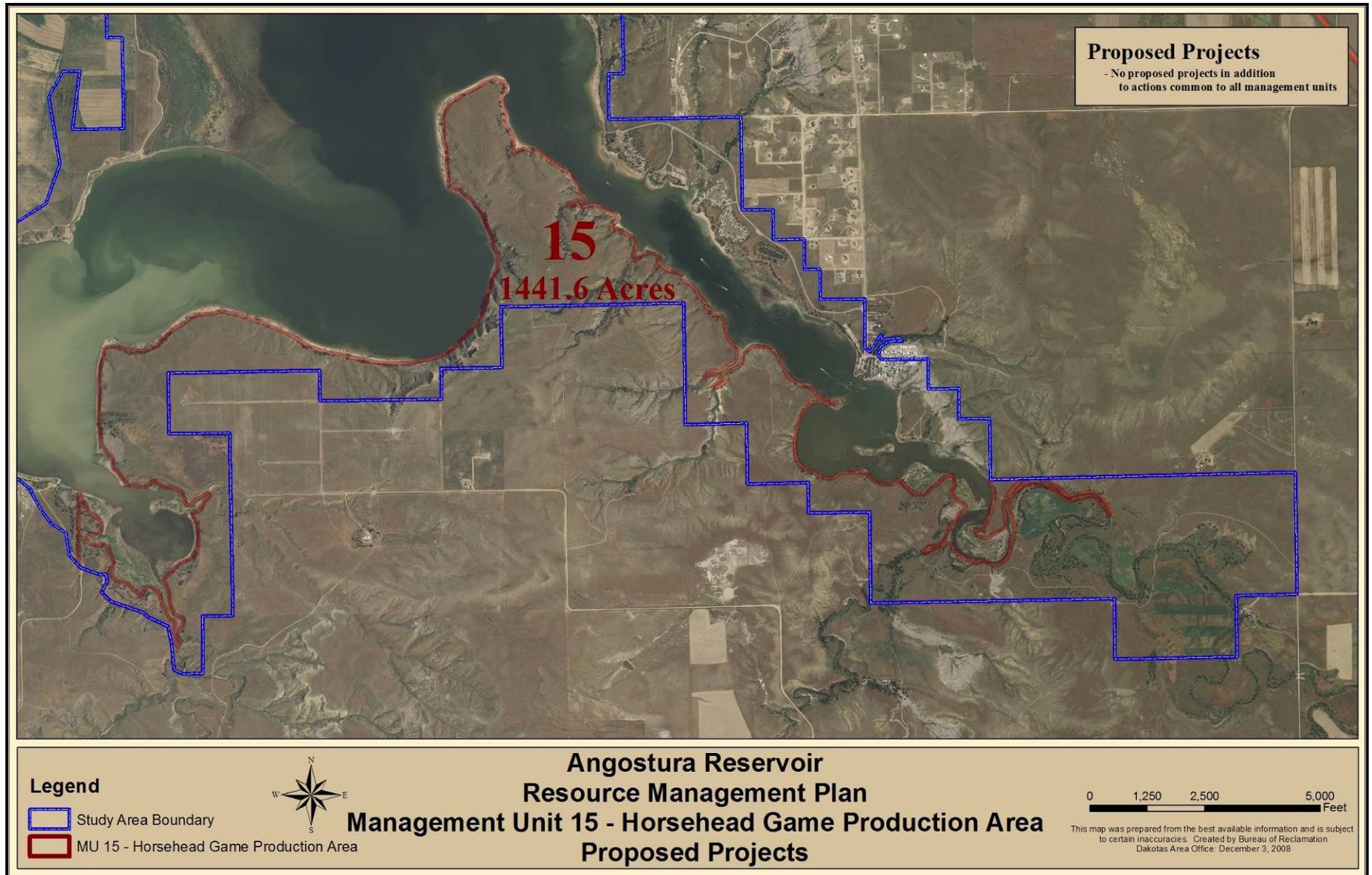
Map 7-13, MU 13 – South Trailer Area



Map 7-14, MU 14 – Shale Banks Day Use Area



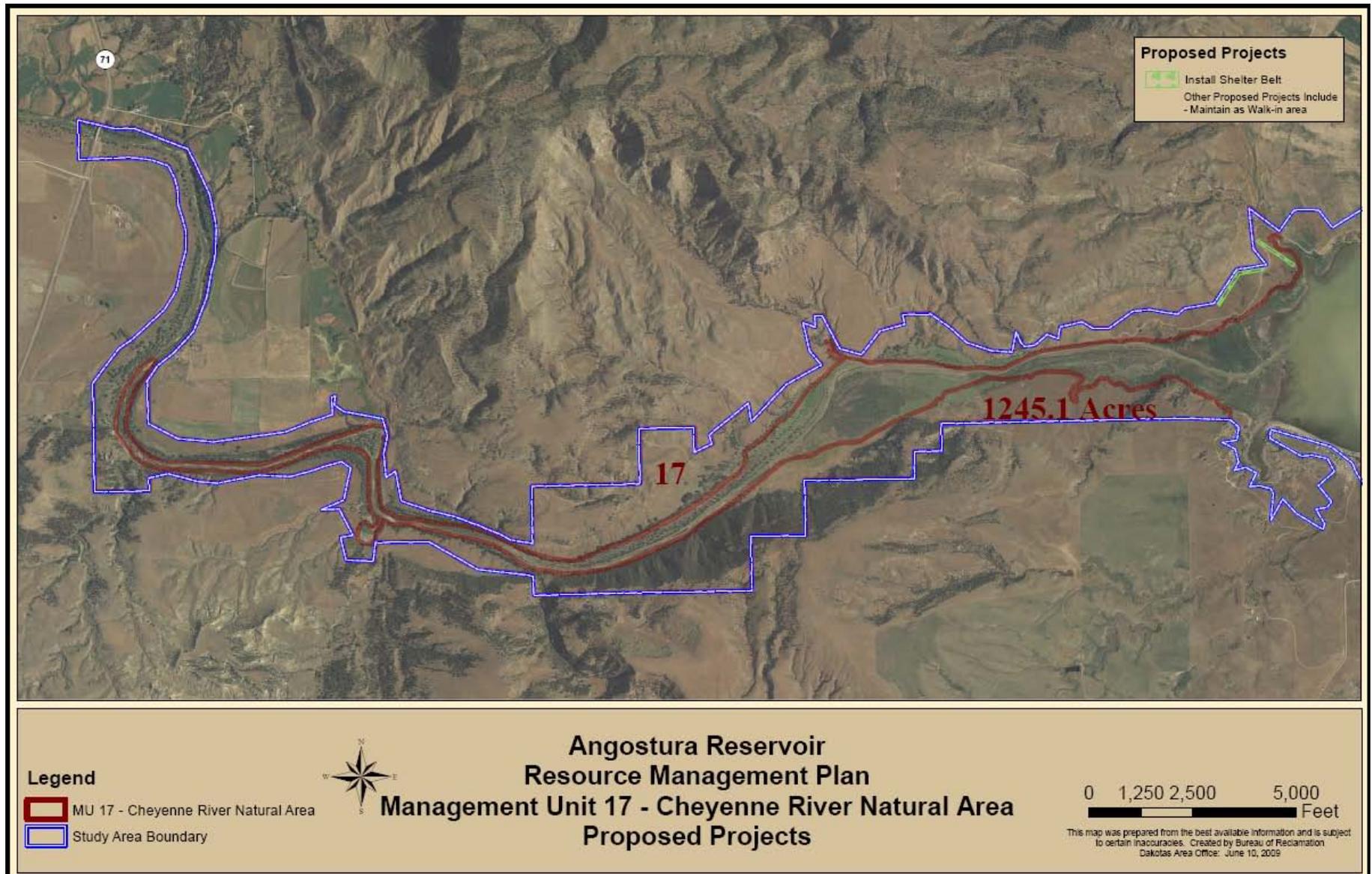
Map 7-15, MU 15 – Horsehead Game Production Area



Map 7-16, MU 16 – Bailey's Lake Side Use Area



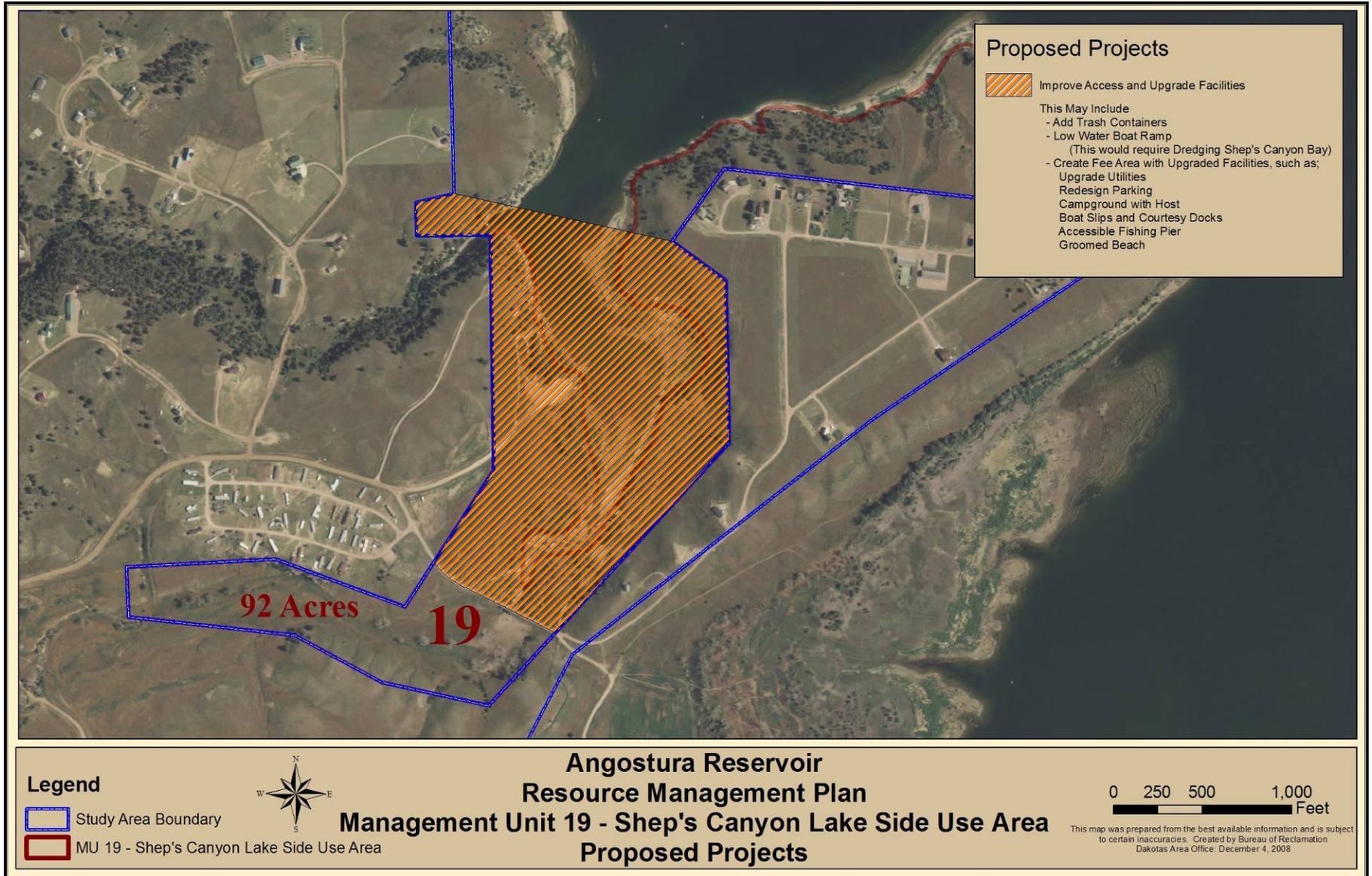
Map 7-17, MU 17 – Cheyenne River Natural Area



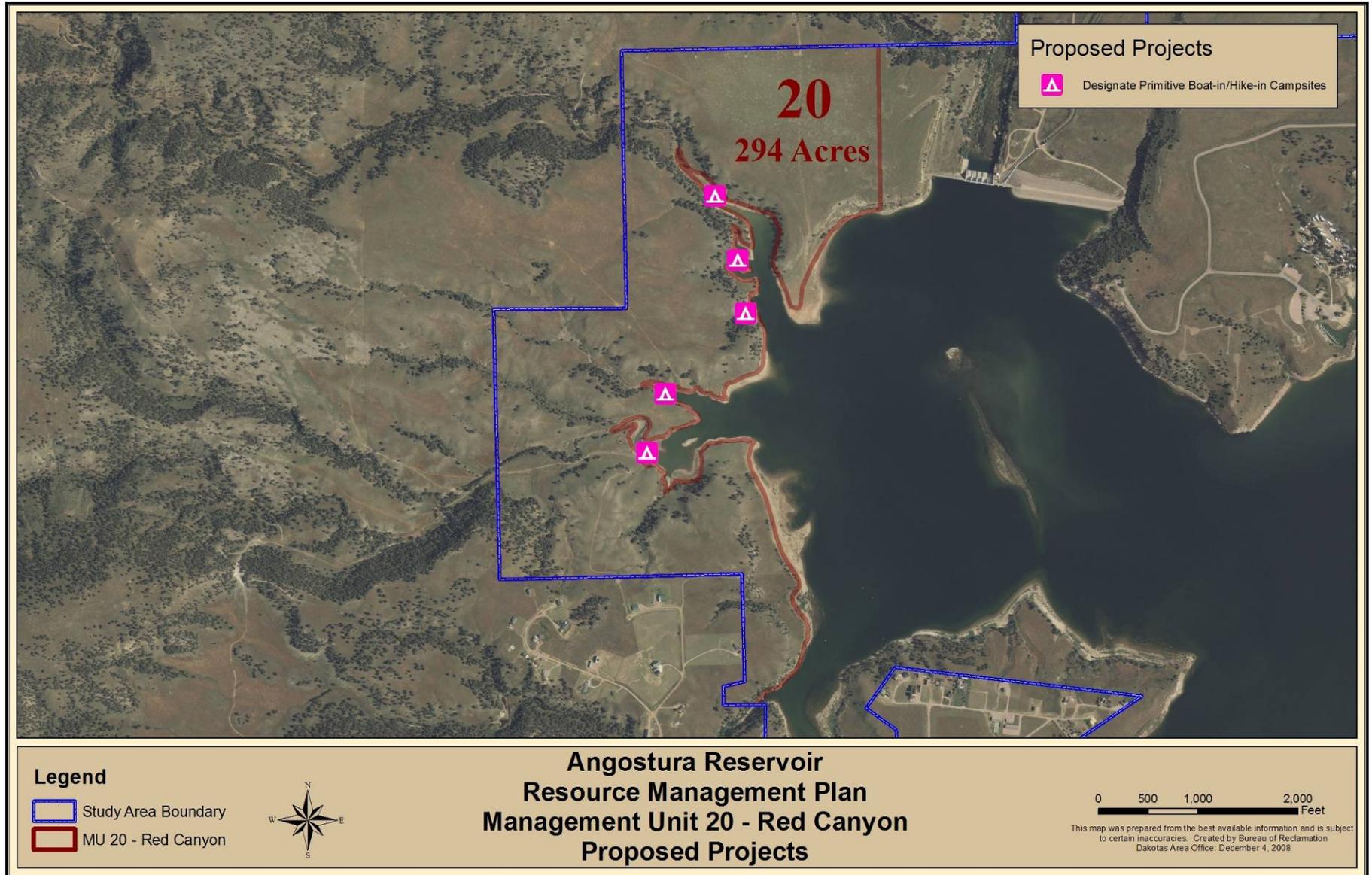
Map 7-18, MU 18 – Cheyenne River Lake Side Use Area



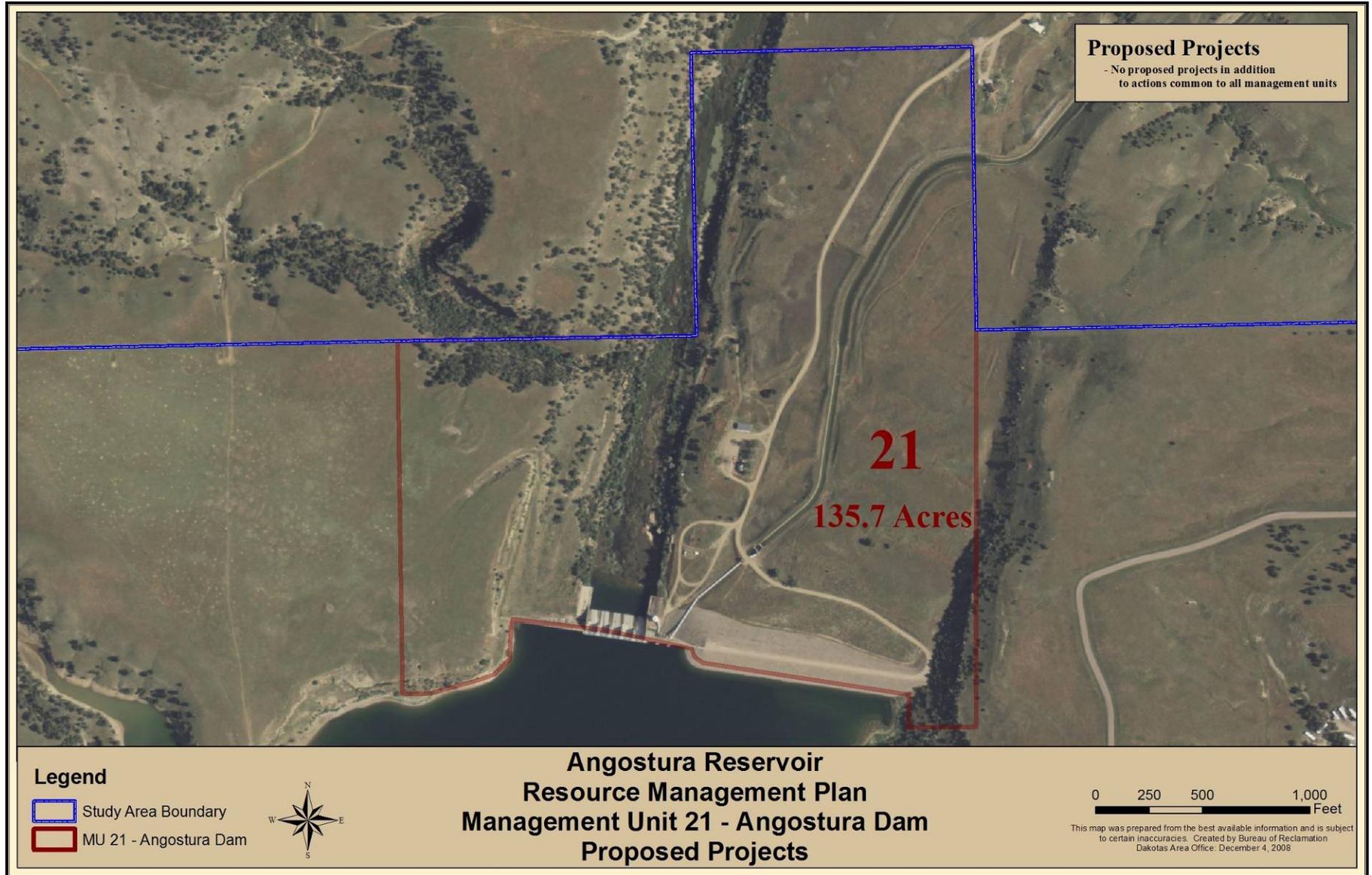
Map 7-19, MU 19 – Shep’s Canyon Lake Side Use Area



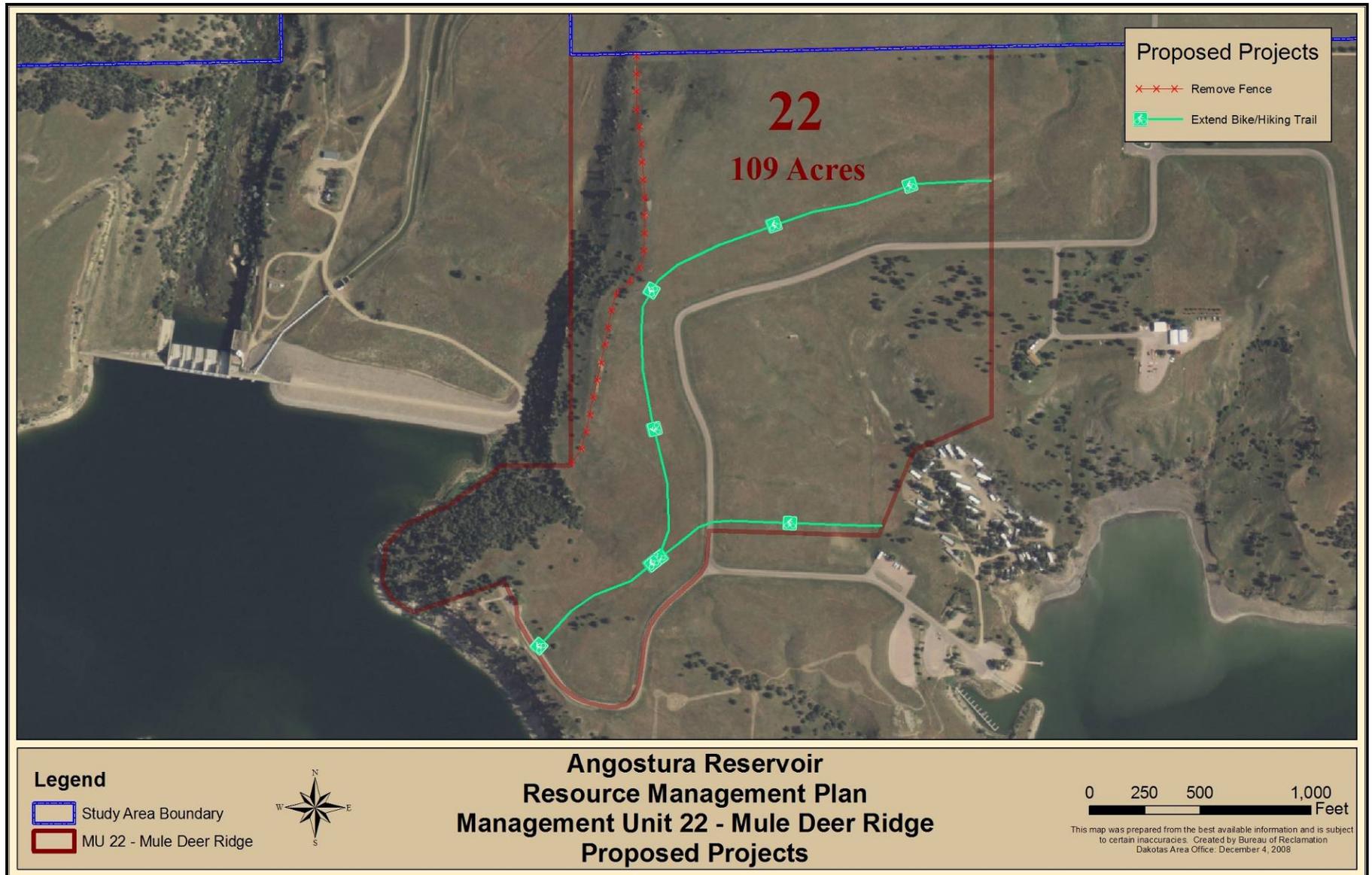
Map 7-20, MU 20 – Red Canyon



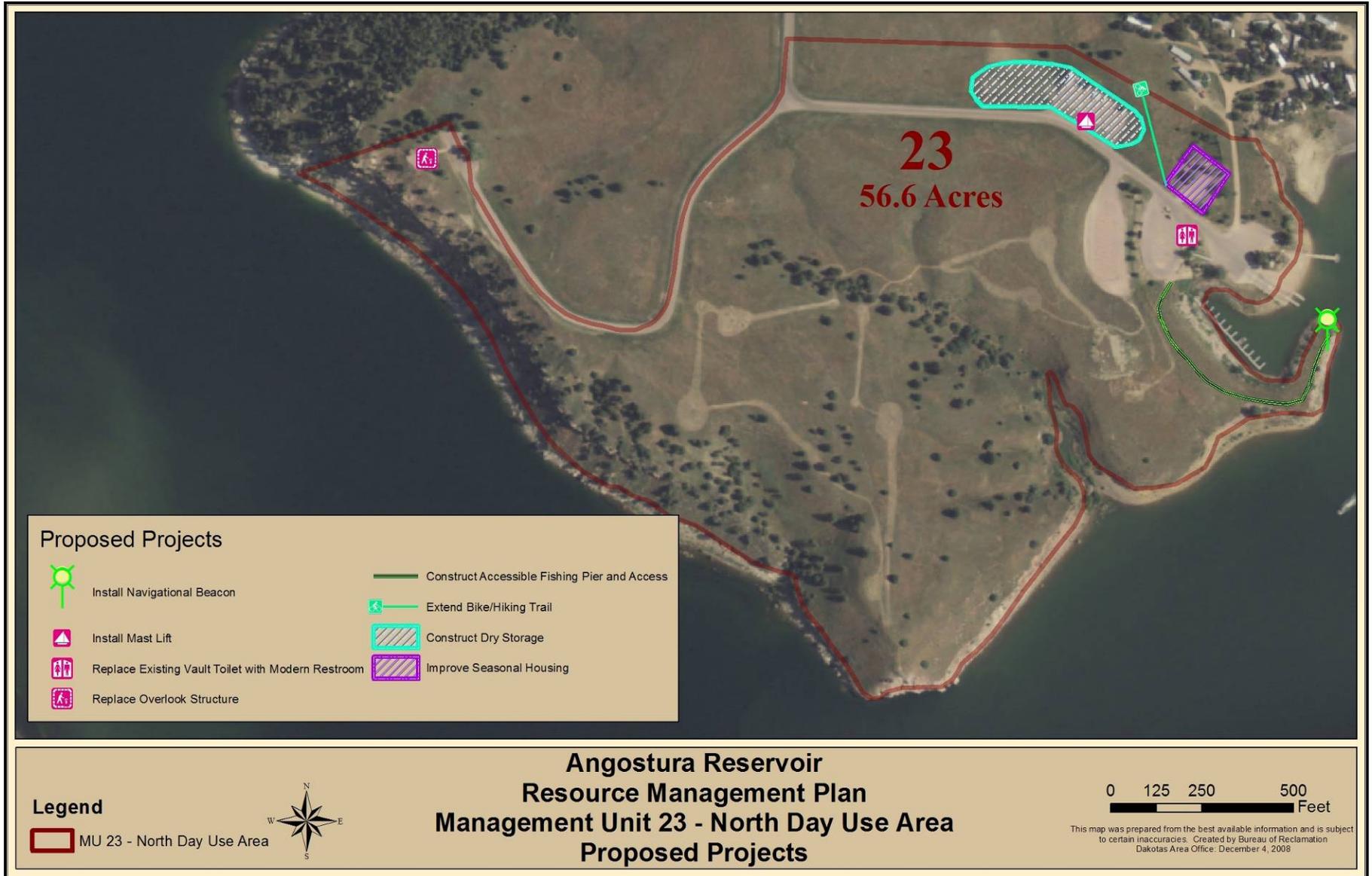
Map 7-21, MU 21 – Angostura Dam



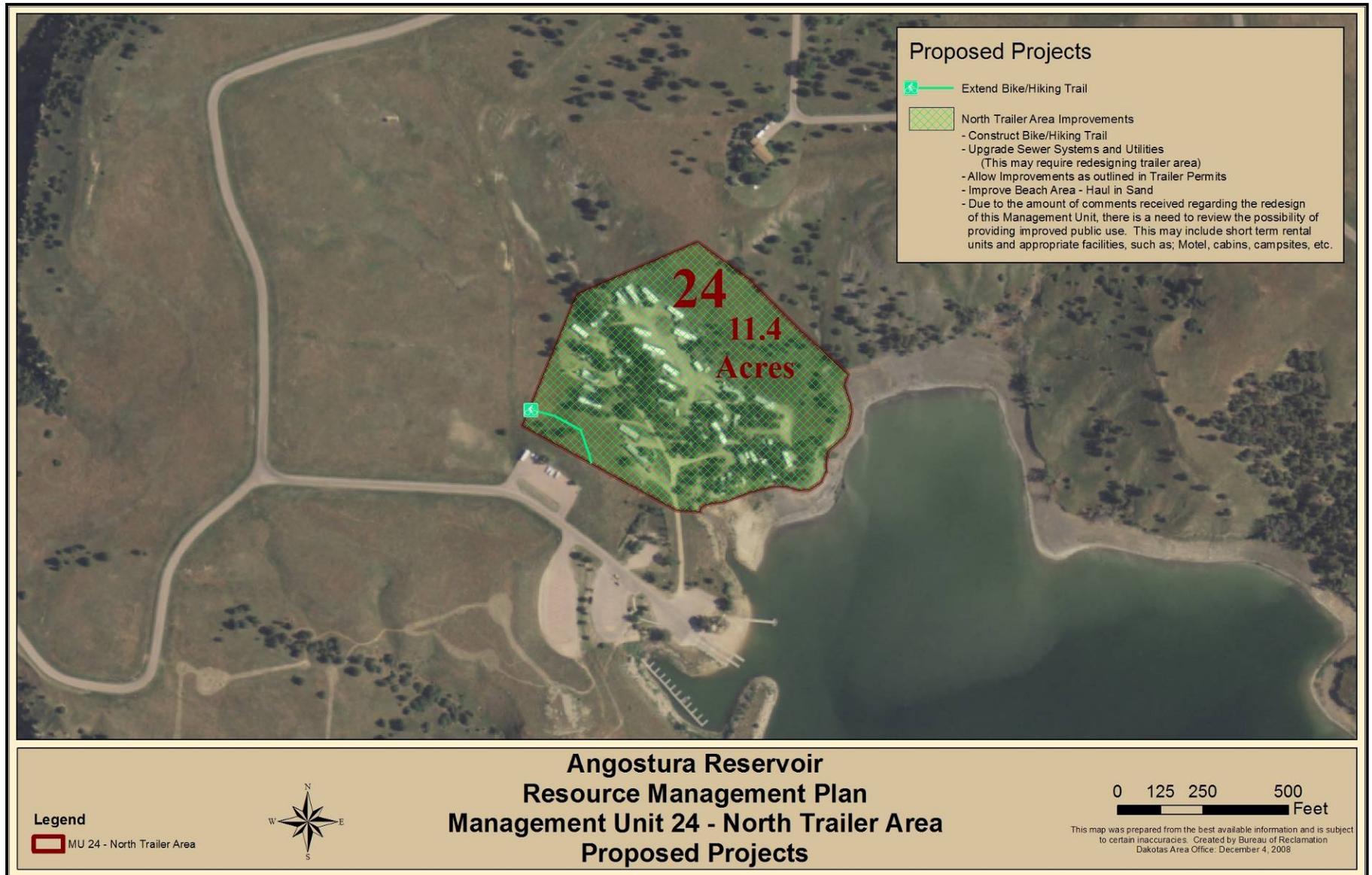
Map 7-22, MU 22 – Cascade Campground



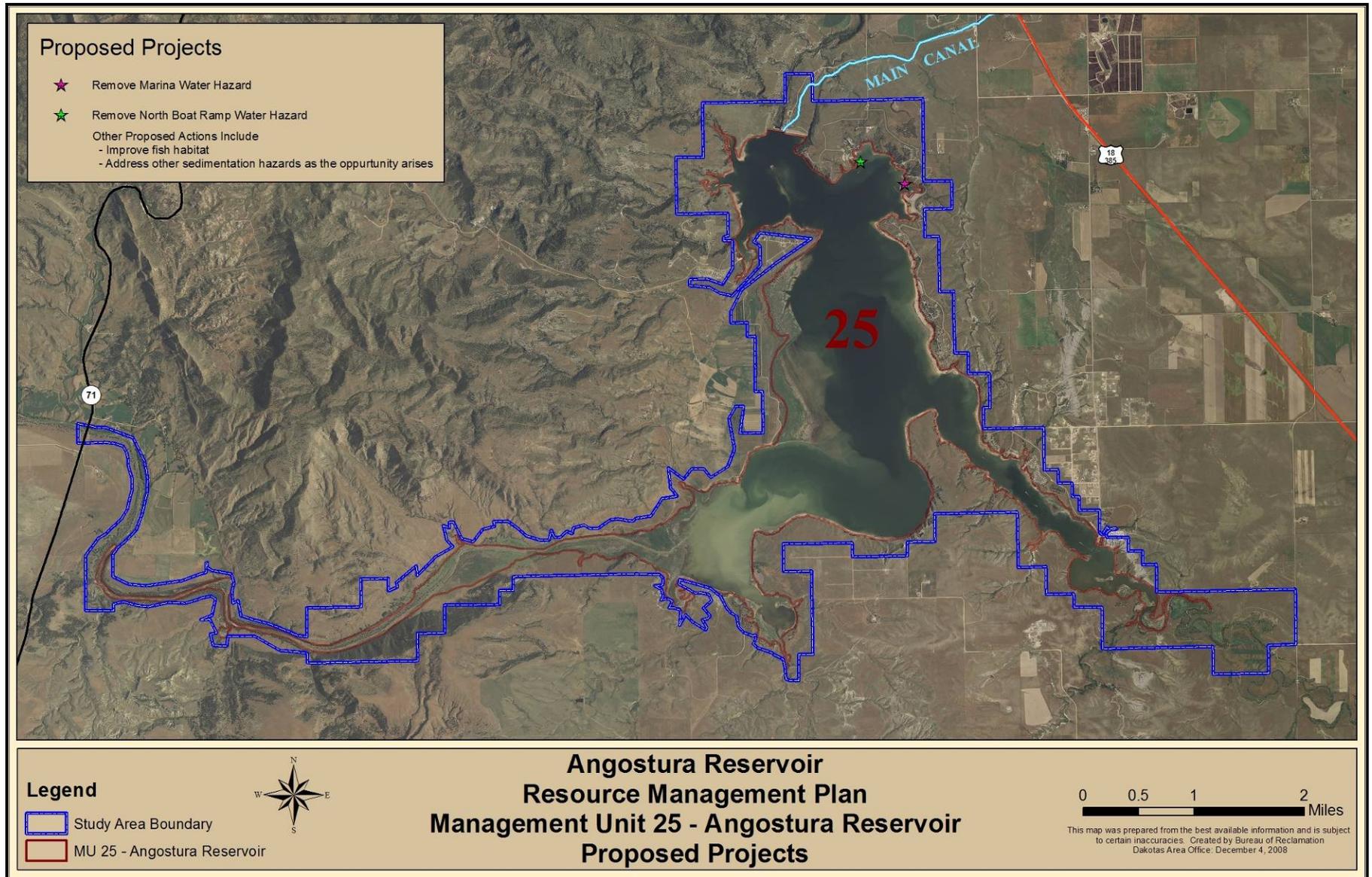
Map 7-23, MU 23 – North Day Use Area



Map 7-24, MU 24 – North Trailer Area



Map 7-25, MU 25 – Angostura Reservoir



Appendix C. Draft EA Comments and Reponses

Draft EA Comments and Responses

Six comment letters were received during the public comment period for the draft EA. The comments are included along with responses to substantive comments. Substantive comments are key comments requiring a response. Substantive comments are highlighted and numbered in the left margin.

Elka Murner

Piper, Tara S

From: Alcorn, Ryan S
Sent: Monday, April 27, 2009 8:20 AM
To: Piper, Tara S
Subject: FW: Comment Sheet or the Angostura RMP Draft EA

Follow Up Flag: Follow up
Flag Status: Flagged

Ryan S. Alcorn
Natural Resource Specialist
Bureau of Reclamation
Rapid City, SD 57701
605-394-9757

ralcorn@usbr.gov (Please note the new e-mail address)

From: Elka [mailto:ejm511@yahoo.com]
Sent: Sunday, April 26, 2009 1:55 PM
To: Alcorn, Ryan S
Subject: Comment Sheet or the Angostura RMP Draft EA

Dear Sir

This email should be considered as my comments in regards to the Angostura RMP Draft EA (DK=5003-09-01)

#1 The preferred alternative for MU 24 mentions "requiring sewer systems to be upgraded and for sites to be vacated if this is not feasible". The map on page 7-99 of the draft EA also mentions "possible redesign of the trailer area" to upgrade sewer systems. No information has been provided, that I am aware of, to the leasees in MU 24 regarding the findings of the sewer inspections that were required prior to October 2008. I would think that if you wanted to give people a fair chance to comment on the "No Action" vs. the "Preferred Action" alternative that this information would have been provided prior to the end of the comment period.

#2 The second priority mentions "reviewing the possibility of providing improved public use" of MU 24. The wording of this section is very uncertain and, again, does not provide adequate information as to whether or not it will happen or when it may or may not happen. The section mentions "short term rental units, such as, a motel, cabins, campsites, etc." Most of these items are available in adjacent MUs. With the proposed projects listed in the draft EA it is evident that cabins and campsites will be added to adjacent MUs which will decrease the need in MU 24. Cabin Area A (MU 7) had proposed public use actions that were eliminated due to availability in adjacent MUs. MU 7 currently has less public use access than MU 24 yet MU 24 seems to be getting more attention for public use growth.

#3

I look forward to the posting of all public comments for review.

Thank you for your time
Elka Murner

Response to Elka Murner

1. Currently the sewer system upgrades have not been determined. SDGFP has received all of the sewer system inspection reports, at this time SDGFP has contracted for a sewer system study which includes all of the recreation facilities as well as MUs 7, 14, and 24. The findings of the inspections will be evaluated as part of the sewer system study which will be used to determine the necessary upgrades for the associated facilities. SDGFP intends to meet with trailer and cabin permittees during the sewer system study to present and discuss options for necessary upgrades.
2. Currently there is not a plan for providing improved public use in MU 24. If in the future it is determined this is necessary, Reclamation and SDGFP would seek additional public involvement on the proposed changes.
3. Proposed management actions in Cabin Area A were eliminated because the facilities proposed are common use facilities such as picnic grounds and a boat launch which are available in adjacent MU's. The public scoping process generated more interest in providing additional specific public use facilities such as campsites and cabins within MU 24.

Joanne

Piper, Tara S

From: joanne [jtbuzz@gwtc.net]
Sent: Tuesday, April 14, 2009 12:54 AM
To: Piper, Tara S
Subject: Angosturia Reservoir

Follow Up Flag: Follow up
Flag Status: Flagged

Last year was the first year in quite a few years, that there was not a negative flow, back up into the Cheyenne river.

Impact as facilities: some were not in working order, some were in need of repair, probably still needs fixed after last summer, shortage of man power and money. I should know I worked there last year.

The rules and regulations need more or better enforcement such as more tickets written = more money to operate.

The fishing was very poor after June there was very little taken or cleaned.

When I did go fishing I had 1 bite in 10 trips, so this tells me, you have almost succeeded in killing

#1 over half of the fishing population. By releasing the water before the eggs hatch you have killed off future generations of fish, thus causing the lake to need to be restocked. By not shutting off the water around the 15 of August you cause low water conditions in the lake, this causes low oxygen supply in the water which also contribute to a lower fish population.

#2 There was no need for the water that was released as we got rain once a week this past year, admittedly that is unusual, we are told that we need only an inch of water for our gardens weekly. Then by the same token crops only need an inch of water per field as they are nothing but a big garden. We need to conserve water, this we are being told constantly, what are you doing to conserve the water?

This is no longer the 1950's, this dam serves about 10 farms, which in turn serves the feedlot, we have moved into the tech age 2009 shouldn't our water systems reflect this?

Let's take a good look at some figures. Let say you pay your water personal about 30,000 a year, now for arguement sake lets say you have 8 people hired for a year. That comes out to roughly 240,000.00 dollars a year, this is not counting the fuel or trucks they use for the year in all honsety that should be added up too.

Now lets just say you paid them for 10 years this sum 2,400,000.00. Pretty cheap labor right, but if you laid a pipeline in the trench you already have dug, use smaller step-up pumps at each station of use, you would have less loss of water, less expensdure in labor as you don't need some many personal to control it, you can place a meter on the stations, so you can regulate/charge for the amount of water being used, it would take less water to start up and charge the system, and less loss of water. By using a pipeline that should be trouble free for a good 20-30 years. Which would save you over 8,000,000.00 in time.

So you would be going green and conserve a valuable resource.

Response to Joanne

1. The EA points out that fluctuating water levels can be responsible for low reproductive success of gamefish and forage species at the reservoir (page 3-51). However, the reservoir continues to support its beneficial use designation of warmwater permanent fish life propagation (page 3-39). The EA does not address the impact of reservoir water operations on fisheries (see response 2.) but does conclude that the quality of wetlands and riparian areas may improve under the selected alternative, thus improving water quality for fisheries.

2. As mentioned in the Introduction of the EA (page 1-2), the RMP will include background information on the District and other water contracts, but would not address reservoir water operations, irrigation facilities, or lands within the District. For additional information regarding the District and reservoir operations refer to the Angostura Unit Contract Negotiation and Water Management Final Environmental Impact Statement, August 2002.

Ken Edel

RECLAMATION
Managing Water in the West

Comment Sheet for the
Angostura RMP Draft
Environmental Assessment

As part of the public scoping process, comments should be sent to Tara Piper, Bureau of Reclamation, 515 9th Street, Room 101, Rapid City, S.D., 57701. Comments should be postmarked by May 15, 2009.

(Please Print Clearly)

Name KEN EDEL

Organization and Address 20 ANNACONDA
Rapid City, S.D. 57761

Phone () 348-1470 FAX _____ E-mail kpedel@cs.com

Please place a check mark in the box if you wish to be removed from the mailing list.

Comments:

1. No easements proposed for Circled Fish cleaning station
2. No proposal to include a boat lift for larger boats during low water periods
3. Provide fishing access below Angostura Dam

*Attach additional sheets if necessary

Please mail your comments to the address on the back of this form, or FAX your comments to 605-394-9346, or e-mail your comments to ralcorn@gp.usbr.gov. Thank you.

The names and comments of those making written or oral statements on this process will become part of a public record. You may request that your name and/or address be withheld from public release. Those requests will be honored to the extent permissible by law.

 U.S. Department of the Interior
Bureau of Reclamation

Response to Ken Edel

1. At the present time no upgrades are proposed for the fish cleaning station, however this does not rule out future upgrades. Operation and maintenance of existing facilities are included as the day to day activities which may consist of upgrading, complete removal, and or replacement of these facilities as needed.
2. With the addition of new and extension of existing boat ramps, the need for a boat lift has been determined to be unnecessary at this time.
3. Reclamation and SDGFP recognize the need for improved access around the reservoir and are looking at areas for improvement. The final RMP will address the restricted areas around Angostura Dam in an effort to resolve public access related concerns.

Rich Marsh

Piper, Tara S

From: Alcorn, Ryan S
Sent: Thursday, April 16, 2009 12:11 PM
To: RichM@cetecengineering.com
Cc: Piper, Tara S
Subject: RE: Angostura RMP & EA

Hi Rich,

The Draft EA is available online at:

<http://www.usbr.gov/gp/dkao/angostura/index.cfm>

Thanks, Ryan

-----Original Message-----

Date: 04/10/2009 03:22 pm -0600 (Friday)
From: "Rich Marsh" <RichM@cetecengineering.com>
To: "Ryan Alcorn" <RALCORN@gp.usbr.gov>
Subject: Angostura RMP & EA

Ryan,

I wasn't able to make it to the Public Open Houses for the Angostura EA.
Is there a draft EA online that I could review? I can't seem to find anything online.

Thanks.

Rich Marsh, P.E.

CETEC Engineering Services, Inc.

1560 Concourse Drive

Rapid City, SD 57703

605.341.7800 Phone

605.341.7864 Fax

CETEC on the Web www.cetecengineering.com <<http://www.cetecengineering.com/>>

Roger Wical

Piper, Tara S

From: Roger Wical [rogerw@gwtc.net]
Sent: Tuesday, April 14, 2009 12:10 AM
To: Piper, Tara S
Subject: Angostura Reservoir

Follow Up Flag: Follow up
Flag Status: Flagged

#1 I have lived here for 12 years now. With the water so low in the reservoir for the last 4 years to seem to me that the only thing this swamp is good for is farmers not fishing or recreation. You could only use 1 ramp for most of the years but still you left it wide open even when the farmers did not even use it. This shows me that you have no clue on what was going on as far as the eco system here did you? I have piped water for a living [water sources for cities]. You need to enclose the water in a pipe and pressurize it. Or at least have a return but the first is much cheaper than maintenance on the dangerous and obsolete ditch you have now. Plus I know that the amount of people needed to keep this kind of system working is many more than a closed system would cost. When it rained last year for weeks on end the water just kept going out. Plus I LOOKED none of the farmers that did use it were not using it. NOT 1 of them!! So why was it left open?? You do not care about the millions of \$\$\$ the state could make on this instead a handful if farmers. In the 50's ya I could see the need but hey guess what it's 2009 now and things have changed. But not the ditch has it???. The amount of revenue for crops compared to sports and recreation has changed since the dam was built has it not?? Why not do the math and see what makes the most money? The world has said DO NOT WASTE THE WATER!!! But guess what you are just letting it just run out. You make it so that if you fish ski or swim you have to drive to the big river like Chamberland S.D. And waste more \$\$ and mess up the environment even more by driving there. There is a way to share this reservoir with all but the way it is run [wide open till september] is stupid and foolish. Either pipe it or have the men employed work and open and close it when not needed. I know I have been told this many times it takes too much work and water to open and close it so why not change that PIPE IT!!!!. A couple of electric pumps could charge the system for all then cap it so pressure stays in the line.

Roger wical

P.O. Box 642 Hot Springs S.D. 57747

Take some of the billions of government money and use it for the good of man, recreation, sports and farming.

Response to Roger Wical

1. As mentioned in the Introduction of the EA, page 1-2, the RMP will include background information on the District and other water contracts, but would not address reservoir water operations, irrigation facilities, or lands within the District. For additional information regarding the District and reservoir operations refer to the Angostura Unit Contract Negotiation and Water Management Final Environmental Impact Statement, August 2002.



DEPARTMENT OF GAME, FISH AND PARKS

Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

May 15, 2009

Dennis Breitzman
Dakotas Area Office
U.S. Bureau of Reclamation
304 East Broadway Ave.
Bismarck, ND 58501

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S/2/10 P	Ryan Faye
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Subject: SD Department of Game, Fish, and Parks Review Comments - Draft EA for Angostura Reservoir Resource Management Plan

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Angostura Reservoir Resource Management Plan. As the agency responsible for managing approximately 4,400 acres of public lands surrounding Angostura Reservoir, we have a vested interest in the Bureau of Reclamation's ongoing resource management plans for the area. I appreciate the active participation my staff has been afforded in the public planning process over the past two years. The Department of Game, Fish, and Parks supports the Preferred Alternative with the exception of the few items specifically noted below. If these items can be modified to our mutual satisfaction, I am confident the preferred alternative will allow for a continued healthy balance between natural resource protection and public recreation opportunities.

I am pleased that the need to upgrade sewer systems around the reservoir has been identified as a high priority. The protection of the water resource at Angostura Reservoir is extremely important. Upgrading deficient sewer systems and vacating sites that cannot be upgraded will go far in safeguarding reservoir water and ensuring a continued high quality recreational environment.

COMMENTS

Page 2-21 Cheyenne River Natural Area – First Priority - Add primitive campsites

Given the existence of ample camping opportunities elsewhere on the reservoir, we do not support the addition of primitive campsites in this natural area. **Camping activity** **#1** would be difficult to manage given the remoteness of the area and would have an impact on the area's natural habitat. We support the designation of primitive campsites at the Cheyenne River Lakeside Use Area (Pelican Point) and feel this is a more manageable area to consolidate camping activity on the west side of the reservoir.

Page 2-22 Cheyenne River Lakeside Use Area - First Priority – Designate primitive campsites

#2 Given the current dispersed camping activity in this area, we support the designation of primitive camp sites and associated improvements included in the First Priority. We want to maintain the option to charge a basic camping fee if it becomes necessary in the future to support the operation of the area. Therefore, we would recommend striking "Maintain as primitive non-fee area" from the First Priority listing.

Page 2-22 Shep's Canyon Lakeside Use Area – Second Priority – Create fee area with appropriate public facilities (actions may include: modification of Shep's Canyon Bay to allow for low water access, add low water boat ramp, add boat slips and courtesy docks, add an accessible fishing pier, maintain a public beach with groomed shoreline, and a campground with host).

The two units of Angostura Recreation Area, located along the east shore of Angostura Reservoir, offer a broad array of developed recreation offerings and several boating access sites. Our management and maintenance headquarters is also located within the recreation area on the east side of the reservoir. Highways 79, 18, and 385 parallel the east side of the reservoir and provide a direct hard-surfaced link from the region's primary population centers to the recreation area. Adequate and dependable boating access is arguably the most demanded recreational service at Angostura Reservoir. Shep's Canyon Lakeside Use Area provides an important boat ramp on the reservoir's west side for which we support continued management. With the addition of the new low water boat ramp at Pelican Point last year, boating access demand can be met on the reservoir's west side regardless of water level. All other services proposed in this alternative are provided on the east side at a level adequate to meet recreational demand. #3 Because of Shep's Canyon's remote relationship with primary transportation links, population centers, and our management headquarters, we can not support the duplication of these management intensive recreational services at Shep's Canyon.

Page 3-63 Section 3.8 Socioeconomic – User Fees

An excerpt from this section states: "While SDGFP expenditures increase each year, there has been a decrease in revenue due to low water and people seeking more primitive recreation opportunities, which have no user fees." #4 We would suggest that a more accurate statement would be "There is a direct correlation between park use revenue and the water level on the reservoir. Extremely low water levels diminish boating access and extend the distance from developed recreation and support facilities to the water. These conditions lessen the desirability of the recreation area and negatively affect fee revenue that is needed to operate the recreation facilities."

Please contact me if you need clarification on any of these comments, or would like to arrange a meeting between our staff for further discussion. Thank you.

Sincerely,


Jeffrey R. Vonk,
Department Secretary

Response to SDGFP

1. Due to access and management concerns the proposed management action of adding primitive camp sites has been removed.
2. A change was made to remove “non-fee” from the proposed management action in this MU. It is Reclamation and SDGFP intent to maintain MU 18 as a primitive area with minimal recreation facilities while optimizing wildlife habitat. While a fee area is not necessary at this time, we do recognize the need to retain the option for fees, if necessary, to support operation and maintenance in the future.
3. The proposed management action was changed to the following, “The public use of this area should be monitored and if the demand continues to increase and the need arises a study should be done to determine feasibility of creating a fee area with appropriate public facilities (actions may include; modification of Shep’s Canyon Bay to allow for low water access, add low water boat ramp, add boat slips and courtesy docks, add accessible fishing pier, maintain public beach with groomed shoreline, and a campground with host).”
4. The suggested change has been made.