

# **Fisheries and Aquatic Resources Adaptive Management System**

**2014-2018**

## **West River Fisheries Management Area Strategic Plan**

**South Dakota Game, Fish and Parks  
Wildlife Division**



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## DIVISION OF WILDLIFE



### Agency Mission

The purpose of the Department of Game, Fish and Parks is to perpetuate, conserve, manage, protect, and enhance South Dakota's wildlife resources, parks, and outdoor recreational opportunities for the use, benefit, and enjoyment of the people of this state and its visitors, and to give the highest priority to the welfare of this state's wildlife and parks, and their environment, in planning and decisions.

### Division of Wildlife Mission

The Division of Wildlife will manage South Dakota's wildlife and fisheries resources and their associated habitats for their sustained and equitable use, and for the benefit, welfare and enjoyment of the citizens of this state and its visitors.

***Our Motto: "Serving People, Managing Wildlife"***

## I. Introduction

The West River Fisheries Management Area (Figure 1) consists of the area west of the Missouri River excluding the Black Hills. It is primarily rangeland, but also contains isolated areas of timber and increasing amounts of cultivated farmland. Annual precipitation averages only 16 to 18 inches and has a large influence on the aquatic habitats and associated fisheries. In this unglaciated landscape, most of the soils are sedimentary shales, mudstones and sandstones derived from the Cretaceous or Tertiary eras. A small lobe of the Nebraska Sandhills also extends into this region. Land within the West River Fisheries Management Area is owned by private individuals and a large number of governmental entities, including the U.S. Forest Service, National Park Service, Bureau of Land Management, Native American Tribes (Pine Ridge, Rosebud, Standing Rock, Lower Brule and Cheyenne River), and the South Dakota Department of Game, Fish, and Parks (GFP). This area is sparsely populated, with nearly 47% of citizens classified as rural (U.S. Census Bureau 2010, U.S. Economic Research Service 2013).

This current plan is an expansion of previous planning efforts. Previously, the 1994 Systematic Approach to Management plan directed fisheries management in the West River Fish Management Area. The current plan incorporates more recent information concerning angler preferences (Gigliotti 2007), angler use (Galinat 2004; Galinat 2005; Miller and Galinat 2006), annual fish population surveys (i.e. Miller et al. 2010), and public comments.

This plan is a dynamic tool addressing the issues, challenges, and opportunities in managing the West River Fisheries Management Area. The components of this plan include an **Inventory** Section, which describes the resources present in this management area, and reviews both historical and current management activities. This section is subdivided into three categories: **People**, **Fish**, and **Habitat**. Following the Inventory Section is the **Issues** Section, listing the current issues involving West River fisheries. Lastly, measurable and time-bound **Objectives**, along with specific **Strategies**, are listed.

While this plan will guide staff working on fisheries and aquatic resource issues in the West River Fisheries Management Area, it is also intended to provide the public with information on current fisheries management directions and activities. Members of the public are encouraged to comment on the plan both during development and during implementation.

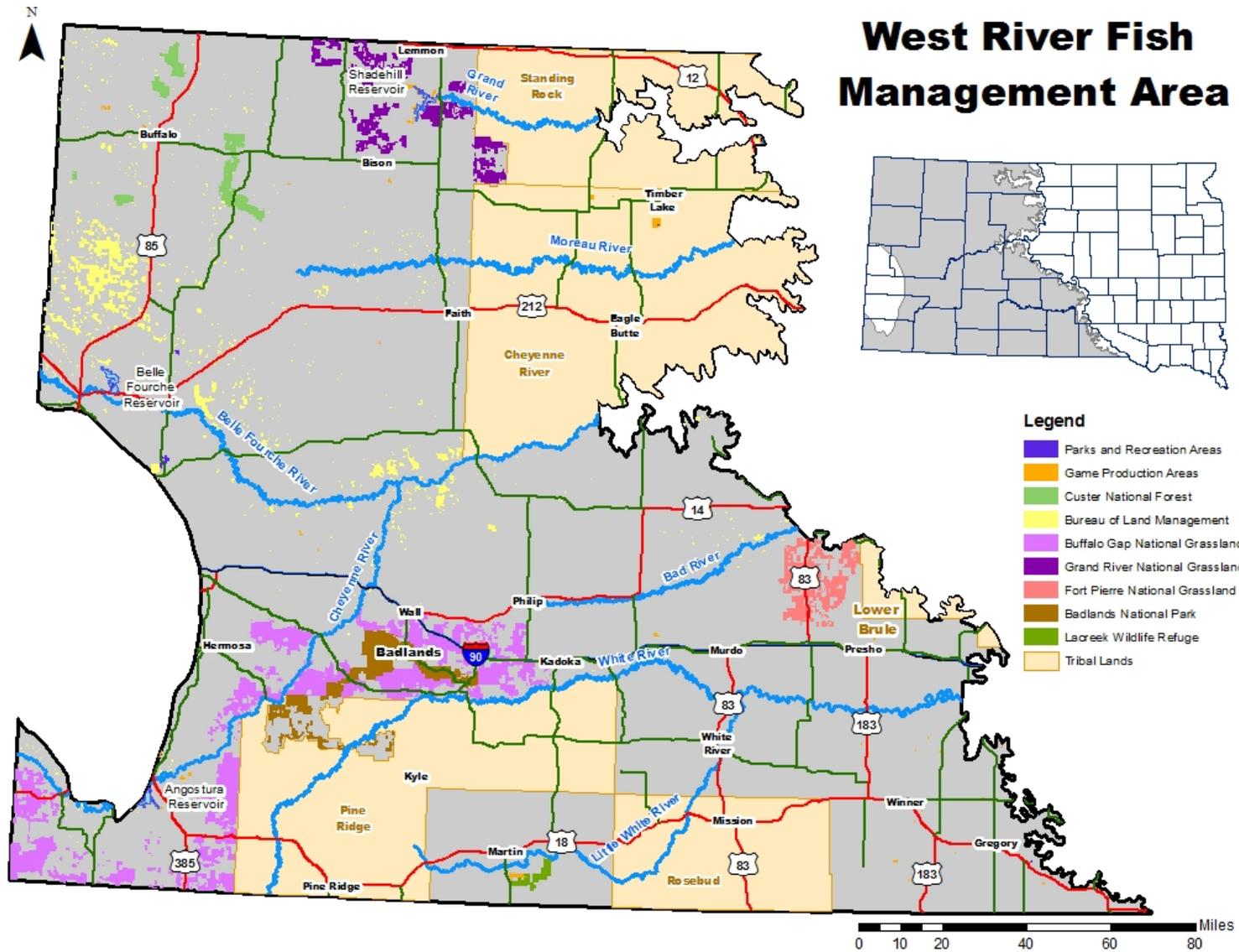


Figure 1. West River Fisheries Management Area.

## II. Inventory

### People

Regulations: Regulations are the primary method for ensuring the fair use of the fishery resource and protecting fisheries from over-harvest. West River fisheries are managed using a variety of regulations. While some of these regulations are statewide in nature (e.g. five Largemouth/Smallmouth Bass combined daily harvest limit), others are lake specific. There are a variety of regulations needed to allow for differences in lake production, current fish population trends, and watershed-specific management objectives (Table 1).

Table 1. West River Fish Management Area 2013 exceptions to statewide regulations.

| Water   | Species         | Regulation  |
|---|-----------------|---|
| Angostura & Shadehill Reservoirs                                      | Walleye         | 15" minimum   |
| Belle Fourche Reservoir   | Walleye         | ≤15" or ≥18" can be taken; of those only 1 may be ≥18"                                    |
| Curlew Lake   | Walleye<br>Bass | 15" minimum; Daily limit 2.<br>15" minimum  |
| Newell Lake   | Walleye<br>Bass | 15" minimum; Daily limit 2.<br>≤14", or ≥18" can be taken;<br>of those only 1 may be ≥18" |
| Burke, Durkee, Murdo, Murdo Railroad, New Underwood, & Richland Lakes | Bass            | 15" minimum   |
| New Wall & Waggoner Lakes   | Bass            | ≤14", or ≥18" can be taken;<br>of those only 1 may be ≥18"                                |
| Missouri River tributaries  | Channel Catfish | No limits   |

Regulations are only effective if anglers abide by harvest restrictions. For example, anglers are somewhat divided in their acceptance of the Walleye protected slot regulation at Belle Fourche Reservoir. While 72% support the regulation, many would like to see it adjusted for specific angling preferences (Galinat, *pers. comm.*).

Angler Preferences and Satisfaction: While information on the preferences, expectations, and level of satisfaction of anglers fishing in the West River Fisheries Management Area is limited, some angler preference data for the larger reservoirs does

exist (Galinat 2004, 2005; Miller and Galinat 2006). Additional information has also been extracted from statewide angler surveys (Gigliotti 2007).

Generally, anglers fishing large reservoirs tended to be satisfied with their experience (Galinat 2004, 2005). Trip satisfaction by anglers fishing Angostura Reservoir was 60% and 62% in 2001 and 2003-04, respectively. Satisfaction was higher with anglers fishing Belle Fourche Reservoir, at 77% in 2003, and 82% in 2009-10. Shadehill Reservoir anglers indicated 92% satisfaction (Gigliotti 2004). Angler preference surveys on these three reservoirs indicated that 95% of anglers primarily targeted Walleye at Belle Fourche Reservoir (Galinat 2005), while only 43% targeted Walleyes at Angostura. Other preferred species included Black Crappie, Smallmouth Bass, Yellow Perch and Northern Pike.

At New Wall Lake (42 acres) and Waggoner Lake (107 acres), angler satisfaction was relatively low at 46% and 60% respectively. These are the only small lakes where angler satisfaction has been collected.

Statewide surveys indicated that large western rivers are being used by anglers (Gigliotti 2004, 2007 and 2011). In 2010, approximately 7.1% of statewide anglers fished the Cheyenne River, 3.4% the Belle Fourche, and 1.8% the Grand River. No angler satisfaction information has been collected on rivers and streams in the West River Fisheries Management Area.

Angler Access: Public access in western South Dakota varies. Generally, large reservoirs have good access through federal lands and state parks. Many small lakes are available to anglers through Lakeside Use Areas or Game Production Areas. However, most small ponds are located on private land and can only be accessed with landowner permission. Access agreements, where GFP stocks fish in these small waters in exchange for reasonable public access, make some of these private ponds available to the public. The duration of these agreements ranges from five years for trout stockings to ten years for bass and panfish stockings.

Fishing access along streams and rivers is governed by South Dakota Codified Law (SDCL). The public has access to waters below the high water mark (SDCL 43-17-1) and in the land below the water (SDCL 43-17-3). These areas may be entered at public areas, such as road stream crossings.

Fish Consumption Advisories: GFP works with the South Dakota Department of Health to test fish for metals, pesticides, and PCBs. Within the West River Fisheries Management Area, there are a few waters (Pudwell Dam, Newell Lake, Coal Springs Reservoir, and Lakes Roosevelt and Isabel) where fish flesh samples have tested above threshold levels, requiring consumption advisories.

Other Management Entities: Other government agencies are involved in fisheries management within the West River Fisheries Management area. The US Forest Service manages grassland ponds, the U.S. Bureau of Reclamation manages irrigation

reservoirs, the U.S. Fish and Wildlife Service manages the LaCreek National Wildlife Refuge, and tribal lands are managed by individual tribal governments. GFP enters into management agreements with these entities to partner on specific projects or for fisheries management efforts in general. The South Dakota Department of Environment and Natural Resources and associated management boards are responsible for issuance of water rights, water quality monitoring, establishment of total maximum daily load values for impaired watersheds, and coordination of the Environmental Protection Agency's 319 program for work on impaired watersheds.

## **Fish**

Species: Designating species as native and nonnative, and determining historic fish populations, is often difficult. Since European settlement, humans have altered aquatic habitats and introduced nonnative species (Bailey and Allum 1962). In addition, fish surveys of the past and present are often not comprehensive, or target only recreational species. Therefore, native species are defined as being presumably present when humans of European-descent first settled South Dakota around 1850 (Hoagstrom et al. 2007).

Native to the West River Fisheries Management Area were several sucker species, Goldeye, catfish, Sauger, Walleye, and various minnows (Rostlund 1952; Bailey and Allum 1962; Lee et al. 1980; Page and Burr 1991; Hoagstrom et al. 2007). Since European settlement, several other species have been introduced, including several species of panfish, Bass, Yellow Perch, Northern Pike, and Gizzard Shad (Rostlund 1952; Bailey and Allum 1962; Lee et al. 1980; Page and Burr 1991; Hoagstrom et al. 2007). Additionally, several coldwater species, such as Rainbow and Brown Trout, have also been stocked (Barnes 2007; Hoagstrom et al. 2007).

Eight fish species in the West River Fisheries Management Area are listed and tracked by the South Dakota Natural Heritage Program as threatened, endangered, or Species of Greatest Conservation Need (SGCN) within South Dakota's State Wildlife Action Plan (WAP) (Table 2; SDGFP 2006).

Although Mountain Sucker are primarily located in the Black Hills Fish Management Area, a small portion of their range is found within the Cheyenne and Belle Fourche River drainages in the West River Fisheries Management Area. While their numbers remain stable in much of their native range, recent declines have been observed in South Dakota (Schultz et al. 2012). The last records for Lake Chub from the Little Missouri River drainage are from the 1950s. With limited current survey data throughout the West River Fisheries Management Area, current Lake Chub status is unknown.

Table 2. South Dakota Natural Heritage Program listed fish species for the West River Fisheries Management Area. Status abbreviations: SE = state endangered; ST = state threatened; SGCN = Species of Greatest Conservation Need.

| <b>Common Name</b>            | <b>Scientific Name</b>          | <b>State Status</b> |
|-------------------------------|---------------------------------|---------------------|
| <b>Blacknose Shiner</b>       | <i>Notropis heterolepis</i>     | SE, SGCN            |
| <b>Finescale Dace</b>         | <i>Chrosomus neogaeus</i>       | SE, SGCN            |
| <b>Lake Chub</b>              | <i>Couesius plumbeus</i>        | SGCN                |
| <b>Longnose Sucker</b>        | <i>Catostomus catostomus</i>    | ST, SGCN            |
| <b>Mountain Sucker</b>        | <i>Catostomus platyrhynchus</i> | SGCN                |
| <b>Northern Pearl Dace</b>    | <i>Margariscus nachtriebi</i>   | ST, SGCN            |
| <b>Northern Redbelly Dace</b> | <i>Chrosomus eos</i>            | ST, SGCN            |
| <b>Sturgeon Chub</b>          | <i>Macrhybopsis gelida</i>      | ST, SGCN            |

Four Species of Greatest Conservation Need historically resided in the Sandhills region of south-central South Dakota. Recent survey work found isolated populations of Northern Pearl Dace, Northern Redbelly Dace and only a single Blacknose Shiner (Felts 2013). Finescale Dace were not sampled within the Sandhills region during surveys conducted from 2010 through 2012 (Felts 2013).

Stocking: The majority of sport fisheries in the West River Fisheries Management Area are the result of stockings. Although Walleye, Sauger, Flathead Catfish, and Channel Catfish are native to some waters in the West River Fisheries Management Area, stockings have been necessary to meet angler expectations. All other game fish species present within the Management Area have been introduced (Hoagstrom et al. 2007).

The first recorded stocking in the West River Fisheries Management Area was Largemouth Bass in Haakon County in 1910. Fingerling stockings occur most frequently. However, trapping adult fish from one location and transferring them to another location also frequently happens. Over 6,000 adult fish were relocated to 16 waters in 2011.

Shadehill, Belle Fourche, and Angostura reservoirs are primarily stocked with Walleye. They have also been stocked with Channel Catfish, Smallmouth Bass, and multiple panfish species. Additionally, Gizzard Shad have been stocked in all three reservoirs to increase available food resources. Water specific management plans and reports can be found within South Dakota’s State library under the Dingell-Johnson reports. Where suitable conditions exist for coldwater fisheries, put-and-take rainbow trout stockings have occurred. Locations receiving trout include Little Moreau #2 and Forest Service pond 9 on the Grand River National Grasslands.

Fisheries surveys: Fisheries monitoring began in the early 1930s, with more extensive surveying starting in the 1950s (Churchill and Over 1938; Gibbs 1952). Since that time, investigations on fish population dynamics, regulation effectiveness, and habitat influences have occurred. Standard fisheries surveys of small impoundments and large reservoirs are conducted on a scheduled rotation.

In the mid-1990s, stream fish population surveys began (Cunningham et al. 1995). Additional stream surveys were completed by South Dakota State University in 2003 (Harland 2003; Harland and Berry 2004), with further stream sampling scheduled for 2014.

Fisheries research: Much of the research in the West River Fisheries Management Area has involved the Cheyenne, Belle Fourche, Keya Paha, White, and Moreau Rivers (Mayden 1987; Hampton and Berry 1997; Loomis et al. 1999; Doorenbos 1998; Fryda 2001; Duehr 2004; Harland and Berry 2004). Other projects include studies to evaluate predator-prey relations with Walleye on large western reservoirs (Ward 2005), determining the age, growth, and recruitment of Channel Catfish on large reservoirs (Stevens 2013), and examining the genetic structure of Yellow Perch (VanDeHey et al. 2013).

Projects involving native fishes provide managers with essential information related to species distribution, status, and habitat associations. They are typically funded by State Wildlife Grants. Recent native species research was conducted in the Sandhills area (Felts 2013).

Undesirable fish introductions: Fish species not stocked by Game, Fish and Parks, such as Northern Pike, Yellow Perch, Largemouth Bass, Smallmouth Bass, Black Bullhead, Green Sunfish and Rock Bass, have established naturally-reproducing populations in many locations throughout the West River Fisheries Management Area (Hoagstrom et al. 2007). The introduction of these species complicates management and may lead to costly removal efforts (Miller et al. 2010).

Fish removals and chemical renovations: Population manipulation is one of the management tools used by fisheries managers to improve and restore fisheries. Removals of undesirable fish or overabundant fish have been done in an attempt to improve fisheries. Black Bullheads are routinely removed during lake surveys, and periodically, more intensive fish removals are also conducted.

In cases where fish removal efforts are unlikely to succeed, chemical renovations have been done to remove all fish from a water body. For example, chemical renovations have occurred in ponds within the Lacreek National Wildlife Refuge to improve fisheries (Vanderbush, *pers. comm.*) and restore native species (Shearer, *pers. comm.*).

Aquatic Invasive Species: Aquatic Invasive Species (AIS) are classified as any species not native to an area that threaten the diversity or abundance of native species, or the ecological stability of infested waters, or commercial, agricultural, aquacultural, or

recreational activities dependent on such waters (NANPCA 1990). Currently, several AIS exist within the West River Fisheries Management Area. Common Carp can be found throughout the Area while European Rudd have been found in Newell Reservoir. Curly leaf pondweed is currently established in Angostura Reservoir. The full impact that AIS have on native species and aquatic habitats is not fully understood.

*Fish Health:* Fish health is a major concern of fisheries managers. Fish health concerns specific to the West River Fisheries Management area include the possible introduction of pathogens, such as Viral Hemorrhagic Septicemia (VHS), from outside of South Dakota.

## **Habitat**

*Large Reservoirs:* Belle Fourche, Angostura, and Shadehill reservoirs are operated by the Bureau of Reclamation (BOR) primarily to provide water for irrigation. They have a beneficial use classification of Warmwater Permanent Fisheries, which is defined as “surface waters of the state which are capable of supporting aquatic life and are suitable for the permanent propagation or maintenance, or both, of warmwater fish” (Lorenzen 2005). Walleye are the primary game fish in all three reservoirs (Galinat 2004; Galinat 2005), but other species present include Black Crappie, Channel Catfish, Smallmouth Bass, Largemouth Bass and Yellow Perch. Additionally, various trout species were stocked historically in unsuccessful attempts to provide additional opportunities for anglers.

*Small Lakes:* Bear Butte and the LaCreek lakes are the only natural lakes in the West River Fisheries Management Area. Other small lakes and ponds have been created by damming intermittent streams to provide water for livestock (stock dams) or irrigation. Most of these were constructed in the 1930s as part of the Works Progress Administration (WPA) or the Civilian Conservation Corps authority (CCC) (Chipps et al. 2007). Recently, GFP constructed New Wall Dam (Miller et al. 2010). Small lakes are an important source of angling opportunity and are typically less than 150 acres. Over 100 small lakes and ponds are managed within the West River Fisheries Management Area, with another 75 privately-owned ponds currently under access agreements. These small lakes are typically managed for Largemouth Bass, but may also have a variety of other species. Water levels often fluctuate dramatically, resulting in periodic fish kills.

*Streams:* There are approximately 5,300 miles of permanently-flowing rivers and streams within the West River Fisheries Management Area, not including an estimated 52,000 miles of intermittent streams (SDGFP 2006). The Area contains six major tributaries of the Missouri River, the Little Missouri, Grand, Moreau, Cheyenne, Bad, and White Rivers. These tributaries drain an estimated 55,718 square miles (SDGFP 1994). Habitat research was conducted on the White River (Fryda 2001), Cheyenne River (Hampton 1998), Bad River (Milewski 2001), and Moreau River (Loomis 1997). In

addition, Doorenbos (1998) evaluated habitat in the Belle Fourche River, a major tributary of the Cheyenne River.

Habitat projects: Habitat improvement projects are often joint efforts between GFP, federal agencies, and non-governmental organizations. Habitat projects have included tree placement in Belle Fourche Reservoir in cooperation with the High Plains Anglers and tree placement in Angostura Reservoir in cooperation with the Black Hills Anglers. Trees have also been placed in smaller lakes like Curlew and Gardner to improve spawning habitat for fish.

Federal assistance through the Clean Water Act, Section 319, is also available to support a variety of water quality improvement activities. These activities often include providing private landowners with technical and financial assistance, completing demonstration projects, and long-term monitoring to help identify best management practices. This funding was used by the South Dakota Grasslands Coalition to improve range conditions and grassland management systems so as to reduce sediment and nutrient flowing into grassland waters (Jessop 2010).

### III. Issues

1. Little is known about the fish species present in prairie rivers and streams.
2. The impacts of drought and flooding on fish populations in small lakes and ponds and intermittent streams are largely unknown.
3. Management strategies have not been developed for nongame species, particularly those listed by the South Dakota Natural Heritage Program.
4. Management generally focuses on in-water habitat and typically excludes riparian areas.
5. Information gaps exist because of to the large number of waters in this management area.
6. The impacts of unauthorized introductions and Aquatic Invasive Species on native and game fish species are poorly understood.
7. Fish species not stocked by Game, Fish and Parks appear in new locations.
8. There is a lack of a unified approach to addressing unauthorized fish introductions.
9. The impacts on fisheries of the structural deterioration of small dams are unmeasured.
10. Habitat degradation (e.g. degraded shorelines, bank destabilization, and sedimentation) is negatively impacting fisheries and species assemblages.
11. Habitat and access projects are not tracked or evaluated upon completion, and cost-benefit analysis is not conducted.
12. The lack of user information on many remote waters makes the prioritization of access projects difficult.
13. Access and use of private waters covered by access agreements is limited.
14. Information on fish health (i.e., disease, viruses, pathogens, and parasites) is limited.
15. Pertinent data collected and stored by tribal and other governmental entities, as well as non-governmental organizations, is not readily available.

16. Current angler demographics and use patterns within a majority of the West River Fisheries Management Area are unknown.
17. Shoreline angling opportunities on small waters are limited during the summer due to abundant aquatic vegetation.
18. An inability to control water levels on large reservoirs negatively impacts fisheries.

#### **IV. Goal, Objectives, Strategies**

**Goal:** Manage fisheries and aquatic resources in the West River Fisheries Management Area of South Dakota for long-term sustainable use and enjoyment.

**Objectives 1:** Use the statewide comprehensive habitat plan, once developed, for monitoring and rehabilitating West River Fisheries Management Area small lakes and ponds by December 31, 2018.

**Strategy 1.1** Use the small dam matrix to help prioritize rehabilitation of small lakes and ponds.

**Strategy 1.2** Maintain and enhance small lakes and ponds monitoring programs to include dam inspections, boat ramp status, and degree of sedimentation.

**Strategy 1.3** Coordinate dam inspections with the Department of Environment and Natural Resources and ensure dam inspections are conducted at scheduled intervals.

**Strategy 1.4** Work with other governmental entities, non-governmental organizations, and stakeholders to rehabilitate three small impoundments.

**Objective 2:** Participate in at least one watershed improvement project to reduce sedimentation and improve water quality by December 31, 2018.

**Strategy 2.1** Identify critical areas in need of watershed enhancement.

**Strategy 2.2** Identify partners, stakeholders, and funding sources.

**Strategy 2.3** Determine criteria for selection of site(s).

**Strategy 2.4** Complete watershed enhancement project(s).

**Strategy 2.5** Evaluate project(s) within two years of completion.

**Objective 3:** Determine demographics and preferences of anglers fishing rivers and streams and small lakes and ponds by December 31, 2016.

**Strategy 3.1** Use annual statewide angler survey data to obtain angler demographics and preferences.

**Strategy 3.2** Collect demographic and preference data through water-specific creel surveys.

**Strategy 3.3** Work with human dimensions staff to develop appropriate and effective public involvement strategies to collect information on angler demographics and preferences.

**Objective 4:** Establish and implement standardized sampling protocols and monitoring programs for streams, rivers, and small lakes and ponds by December 31, 2018.

**Strategy 4.1** Identify information needs and the waters to survey to fill those needs.

**Strategy 4.2** Establish working relationships with other state and governmental entities to encourage data sharing.

**Strategy 4.3** Work with GFP private lands biologist and conservation officers to gain access to waterways through private lands.

**Strategy 4.4** Incorporate methods used in the western prairie streams study during development of standardized sampling protocols.

**Objectives 5:** Develop and implement management strategies to mitigate unauthorized fish introductions by December 31, 2018.

**Strategy 5.1** Utilize social marketing techniques to increase angler awareness of the issue.

**Strategy 5.2** Document instances of unauthorized fish introductions and determine impacts of such introductions on nongame and game fish species.

**Strategy 5.3** Develop water-specific management actions to address unauthorized introductions.

**Objective 6:** Improve access on five small waters by December 31, 2018.

**Strategy 6.1** Utilize the statewide access inventory and assessment being developed to identify and prioritize areas in need of access improvements.

**Strategy 6.2** Complete five projects to provide shoreline fishing access on water bodies affected by aquatic vegetation during summer months.

**Strategy 6.3** Complete projects to improve vehicle and boat access at five locations.

**Strategy 6.4** Evaluate access projects for increases in angler use and satisfaction within two years of access project completion.

**Objective 7:** Develop and standardize surveys to inventory and monitor non-game fish species by December 31, 2018.

**Strategy 7.1** Develop and prioritize a list of species to inventory and monitor.

**Strategy 7.2** Design a standardized survey and sampling protocols to collect the information necessary for management.

**Strategy 7.3** Incorporate methodologies from the South Dakota State University Western Prairie Streams study currently being conducted into survey designs.

**Strategy 7.4** Identify and collaborate with partners to exchange data, and develop and conduct surveys.

**Strategy 7.5** Prioritize and conduct projects to assess the condition and status of non-game species.

**Strategy 7.6** Incorporate data on species distribution trends and status into the non-game component of the statewide aquatics database.

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