Black Hills Beaver Action Plan 2025–2029

SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS
PIERRE, SOUTH DAKOTA

WILDLIFE DIVISION REPORT TBD

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This action plan will be used by South Dakota Department of Game, Fish and Parks staff on an annual basis and will be formally evaluated at least every five years. Plan updates and changes, however, may occur more frequently as needed.

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Cover photo by Mike Klosowski, Castle Creek 2022. All text and data contained within this document are subject to revision from corrections, updates, and data analysis.

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PUBLIC INVOLVEMENT

A draft of the “Black Hills Beaver Action Plan, 2025 − 2029” was available for public comment from INSERT DATES HERE.

INTRODUCTION

American beaver (*Castor canadensis;* hereafter, beaver) are an economically important furbearer valued for their pelt, castor, and other resources. Beaver occur in aquatic ecosystems throughout much of the continental United States, including South Dakota. Beaver are associated with specific features on the landscape such as perennial water (Novak 1987), food availability (Allen 1983), and topography with low gradients and flat flood plains (Retzer et al. 1956, Olson and Hubert and 1994).

Beaver are social animals that live in a family group typically consisting of a mating pair along with kits from the past two years. Dispersion from the family lodge occurs most often during the spring of the subadults second year. Dispersion distances from 2−17 km have been documented which are dependent on many factors including sex, population density and habitat (McNew 2005). Once a beaver reaches its new location at 2 years old, it is sexually mature and will breed that winter with a litter of 1−7 kits being born the next spring (Brenner 1964). Beaver range expansion is a slow progression due to these lifecycle and social structure factors.

Although ecological services provided by beaver are beneficial, their populations can reach a level where they exceed social tolerance. When populations reach this level, beaver can damage infrastructure resulting, in flooding, or the destruction of valued trees or crops. Managing beaver populations requires the acknowledgement of their ecological value while also maintaining population levels that support recreational opportunity and minimize infrastructure damage.

Beaver serve as a vital role in ecosystems by altering wetland topography, vegetation, and other landscape features (Johnston 1994, Naimen et al. 1994, Wright et al. 2002, Rossell et al. 2005). These alterations provide positive impacts on stream hydrology by reducing sediment transportation, increasing water storage, reducing downstream nutrient transport, and attenuating high-flow events (Puttock et al. 2017, 2018, 2021; Westbrook et al. 2020), in addition to other biodiversity benefits (Rosell et al. 2005). Because of these positive environmental influences, beaver were selected as a Management Indicator Species (MIS) for the BHNF as part of the Phase II Amendment (USDA Forest Service 2006) to the revised 1997 Land and Resource Management Plan.

By the early 1900s, beaver were extirpated from many portions of their traditional range due to excessive harvest (Baker and Hill 2003). However, through the implementation of harvest protection measures and reintroduction efforts, beaver are generally abundant, and their populations are restored in much of their range (Rosell et al. 2005), including South Dakota. Nonetheless, recent survey efforts within the Black Hills Fire Protection District (BHFPD) have indicated a decrease in beaver abundance and distribution since more intensive survey efforts in 2007 (GFP and BHNF 2023).

The Black Hills National Forest (BHNF) comprises approximately 1.2 million acres in western South Dakota and northeastern Wyoming. There are approximately 300,000 acres of non-National Forest System lands, mostly in private ownership, within the BHNF administrative boundary (USDA Forest Service 2005). Many of these inholdings occur adjacent to streams determined as suitable for beaver.

In the Black Hills of South Dakota, beaver were so numerous at the time of the Custer expedition that troops often had a difficult time crossing streams. By 1887, beaver populations had diminished to the point that a two-year closed season was implemented. The season

remained closed until 1909 when it was then re-opened, and beaver were protected from April 1 to November 15. However, the season was subsequently closed again in 1925, and only beaver causing damage were removed. In response, the South Dakota Game and Fish Department, now South Dakota Department of Game, Fish and Parks (GFP), started a beaver relocation program. From 1936 to 1944, a total of 395 beaver were relocated to suitable sites across the northern Black Hills, a third of which were released at sites where a dam and lodge were artificially prepared by staff. By 1946 they were said to be well distributed throughout the northern Black Hills and the season was reopened. During that same time, 1,892 beaver were trapped and pelted across a 700 square mile area encompassing the northern Black Hills (Harris and Aldous 1946).

This is an action plan for all constituents interested in the conservation of beaver within the BHFPD of South Dakota. With careful coordination among stakeholders, South Dakota's trapping and outdoor heritage will be preserved for future generations. GFP will manage beaver populations within the BHFPD with scientific data and techniques to encourage occupation of suitable available habitats and to provide sustainable use and enjoyment within the social tolerance level for this species.

POPULATION DYNAMICS

Age-specific survival rates are major predictors in determining population growth in beaver (Boyle and Owens 2007). Survival rates are influenced by human induced mortality (Vanden Berge and Vohs 1977, Novak 1987, Wilson and Ruff 1999), habitat destruction (Henderson 1960) and environmental factors such as, drought, winter severity, and extreme water fluctuations (Henderson 1960, Novak 1987, Rutherford 1964). Outbreaks of diseases, such as tularemia, can affect beaver populations, locally (Novak 1987). Predation is generally not a significant cause of mortality (Boyla and Owens 2007). However, predation can have significant impacts on beaver populations locally (Baker and Hill 2003). Specific declines in the BHFPD are undetermined and more research is needed on this population to determine specific limiting factors and sources of mortality.

POPULATION MONITORING

Historically, monitoring beaver in the BHFPD to collect baseline occupancy and abundance has been done via helicopter cache surveys in cooperation with the U.S. Forest Service (USFS) because of their MIS status. In addition, GFP annually conducts furbearer harvest surveys to estimate county-wide harvest in South Dakota. Harvest survey requests are sent electronically to all resident and non-resident furbearer license holders. Opportunistic reports of beaver and their sign are also used as indices to occupancy and distribution.

The first beaver MIS monitoring occurred October 22−26, 2007 (Table1). The second round of beaver population monitoring occurred October 29 through November 2, 2012 (Table 1). The third and most recent round of beaver population monitoring was a collaborative effort between GFP and USFS; it occurred October 23−31, 2023 (Table 1).

Table 1. Beaver abundance and distribution from 2007, 2012, and 2023 within the Black Hills Fire Protection District.

Monitoring Indices	Year		
	2007	**2012**	**2023**
Number of caches observed	38	60	16
Abundance (cache/km)	0.020	0.038	0.009
Distribution (% of watersheds occupied)	42.3%	51.9%	23.1%

Survey methods follow the protocol prepared by Beck et al. (2008). This protocol identifies food caches as the indicator of beaver abundance and distribution. Watersheds relating to fifty-two, 12-digit Hydrologic Unit Codes (HUC12) are monitored (Figure 1). Hydrological Unit Codes are a nationwide system that delineate watersheds based on surface hydrologic features. Forty of these are monitored for beaver abundance where all food caches observed are counted. These watersheds are rated as having “high” and “moderate” habitat suitability. Twelve, HUC12s are only surveyed for beaver distribution. Once a food cache is observed in a distribution watershed the survey proceeds to the next watershed because presence has been confirmed.

Reports of beaver are collected to help determine occupancy and distribution throughout the BHFPD. Reports of beaver are categorized based on the primary method used to identify the animal as beaver: sighting, sign, incidental trap, and vehicle kill. Sightings are based upon the actual observation of a beaver. Reports of sign are based on, but not limited to, tracks, slides, castor mounds, dens, circular or vertical chewing of trees, beaver dams, and food caches. Incidental trap reports are of beaver that were incidentally caught while targeting other species. Vehicle kills are reports of beaver found dead on the road or hit by a vehicle. A report can be of an individual animal or a group of animals.

Certain criteria are used to determine the reliability of each report:

- A **verified report** is one of a carcass or live-captured individual(s) or where evidence exists that proves the report was a beaver. Photos where the animal or sign can be clearly identified as a beaver may also be considered verified. Knowledgeable reviewers may include agency staff familiar with beaver or experts.
- A **probable report** is a sighting or presence of sign not accompanied by a photo but is observed by someone with beaver experience and knowledge.
- An **unverified report** is a report with no evidence to support or reject the report.

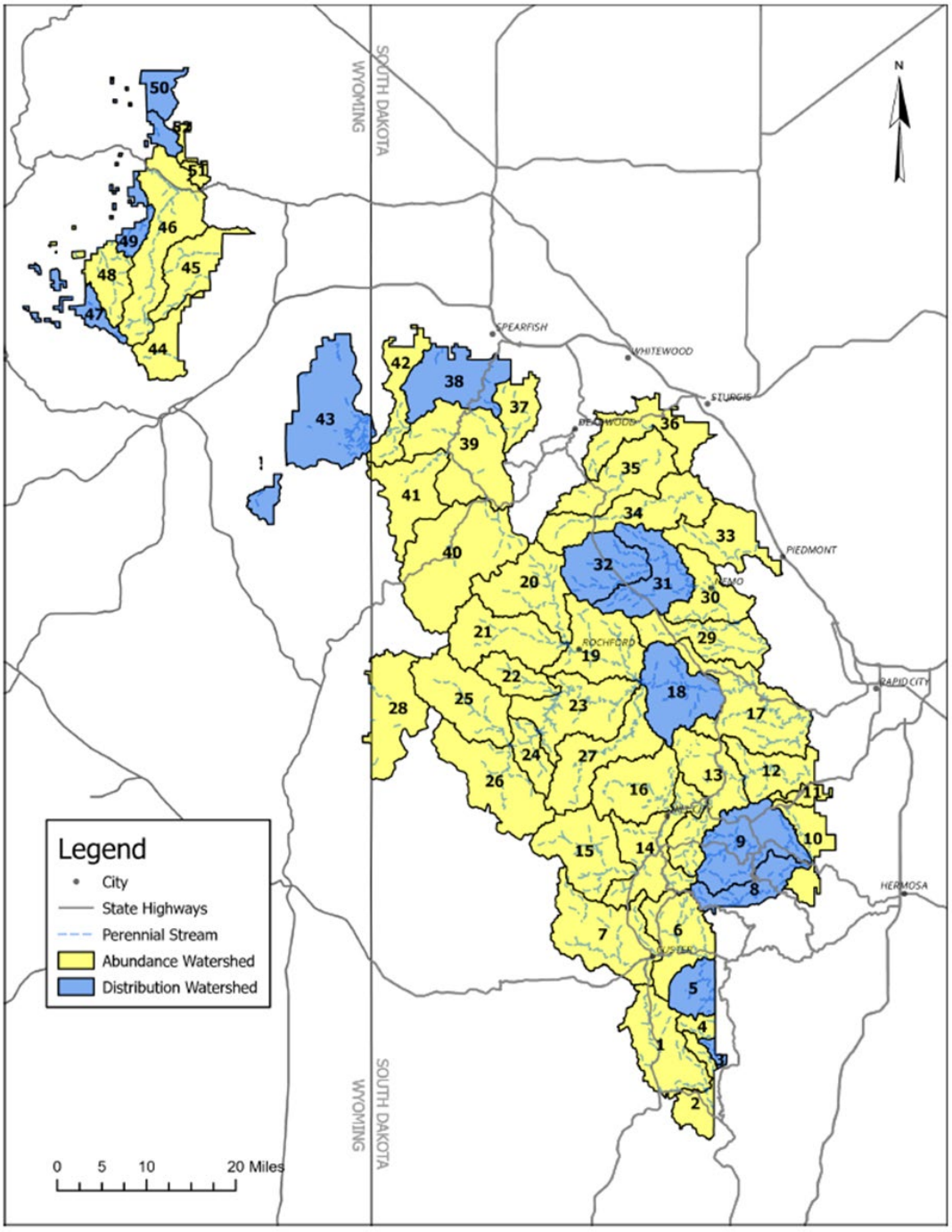

Figure 1. Fifty-two, 12-digit watersheds sampled for beaver abundance and distribution.

HARVEST STRATEGY

Beaver populations are managed to maintain a level within social tolerance of the damage they might cause while allowing for the use of their valued pelt. Season length (Erickson 1981) and market prices influence beaver harvest more than high or increasing beaver populations (Novak 1987). Harvest can negatively influence beaver population density (Nordstrom 1972, Parsons

and Brown 1978); however, reproduction can replace annual mortality when habitat is adequate (Novak 1987).

Within the BHFPD, beaver trapping is open from January 1 to March 31 on U.S. Forest Service Lands and on non-U.S. Forest Service lands within the BHFPD from November 1 to April 30. Non-residents may only trap beaver from December 1 to March 15 within the constraints described above. Current season dates are in place to bridge the gap between a restrictive season on public lands in the Black Hills and unlimited seasons across the rest of South Dakota. These restrictive dates allow trappers the recreational opportunity of fur harvesting, while allowing them to address potential depredation issues.

At low densities, a conservative approach to harvest is needed to sustain beaver in the BHFP. A minimum of 60% distribution rate of beaver in HUC12 watersheds is recommended to initiate a modified trapping season limited to residents (Table 2). A less restrictive season could occur when distribution is above 80% in HUC12 watersheds (Table 2). Below 60% distribution, no season is recommended (Table 2).

Table 2. Black Hills Fire Protection District harvest strategies for beaver trapping season recommendations, 2025−2029.

Monitoring Indices	BHFPD[A] Season Recommendation	Wildlife Damage Response
≥ 80% distribution of watersheds occupied by beaver	Option for trapping season open to private and public lands. Non-resident trappers may be restricted in their trapping dates.	Depredation issues are addressed with technical advice from GFP Wildlife Damage staff (WDS). Lethal removal can occur if WDS staff deem necessary, or trap and transfer may occur.
50-79% distribution of watersheds occupied by beaver	Option for restricted trapping season, including harvest limits, and open to private lands, but closed on public lands. Non-resident trappers may be restricted in their trapping dates.	
< 50% distribution of watersheds occupied by beaver	No trapping season	

[A] Black Hills Fire Protection District as outlined in statute, 34−35−15.

REQUESTS FOR SERVICE

Beaver pond water, chew trees, and can negatively affect utilities such as culverts. These actions can cause significant damage to private property and public infrastructure. GFP employs 28 Wildlife Damage Specialists (WDS) statewide in part to assist private landowners manage damage caused by beaver. Outside the Black Hills, where most of the land is privately owned, lethal removal is used to address requests for service involving damage or issues caused by beaver. In the Black Hills, WDS respond to depredation requests by providing technical advice such as recommending fencing or other deterrents to prevent damage. Lethal removal can occur on a case-by-case basis, typically when infrastructure is threatened, and other tools may cause undue delay. Where beaver threaten culverts or other infrastructure, devices such as a "Beaver Deceiver" are used to prevent water levels from reaching a level where they cause damage. Hog paneling or other welded wire paneling is used to block the mouth of culverts and prevent beaver from plugging culverts. In situations where deterrents or technical advice fail, or there is a need for supplemental beaver within remote portions of the Black Hills, beaver can be live trapped and relocated to suitable habitat.

MANAGEMENT OBJECTIVES AND STRATEGIES

South Dakota will manage beaver populations within the BHFPD with scientific data and techniques to encourage occupation of suitable available habitats, and to provide sustainable use and enjoyment within the social tolerance level for this species.

Objective 1: Determine the status of beaver populations.

Strategies:

1.1 Annually monitor distribution and abundance of beaver throughout HUC 12 watersheds within the BHNF using various survey methods (i.e., ground-based and/or aerial observations) within the calendar year.

1.1.1 Recommend trapping season harvest strategies, based on survey results (see Table 2).

1.2 Annually collect and summarize beaver reports of signs and sightings to improve knowledge of distribution and abundance using Survey 123; refine reporting process as needed.

1.3 Annually collect and summarize beaver depredation reports to improve knowledge of distribution and document abundance; refine reporting process as needed.

1.3.1. Relocation of nuisance beaver to suitable habitat, as necessary.

Objective 2: Coordinate with private landowners and conservation partners to promote the restoration of streams and riparian habitat.

Strategies:

2.1 Restore degraded beaver habitat through the construction of low-cost-low-tech devices such as Beaver Dam Analogues (BDAs) or Post Assisted Log Structures (PALS) (Appendix 1), as well as planting native hardwood species such as willow and aspen.

2.1.1. Increase BDA restoration monitoring efforts (e.g., habitat succession, water quality, beaver presence) with assistance from conservation partners. Strive for the influence of 2 miles of stream, annually, through these restoration efforts.

2.2 Provide financial and technical support to interested landowners through GFP private lands cost-share programs, and partner programs to create or improve existing wetland and riparian habitat through restoration projects, rangeland management projects, and grazing and forestry practices.

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APPENDIX

Appendix 1. Photo of a Beaver Dam Analogue (BDA) installed in the Black Hills of South Dakota.