From: Rajni Lerman <rajni1love@gmail.com>
Sent: Thursday, November 6, 2025 3:54 PM
To: Binegar, Brenda <Brenda.Binegar@state.sd.us>
Subject: [EXT] In the Manner of Clean Nuclear Energy Corp. Uranium Mining Permit Application EXNI 453 - Response from Intervenor

Dear Ms Binegar,

Please find attached my response to Clean Nuclear Energy Corp Interrogatories & Requests for Production of Documents.

This is a copy of the originals mailed to Gunderson Palmer Nelson & Ashmore, LLP, as well as to you.

Please note in regards to documentation #2, SD Game Fish & Parks Biennial Commission Review of SD Threatened and Endangered Species List from the September 2024 Commission Meeting.

I have attached the full document here, and only printed pertinent pages on the hard copy. (pg 1,3, 21-37)

Thank you,
Caryn Lerman
Individual Intervenor
303-564-0787

STATE OF SOUTH DAKOTA
DEPARTMENT OF AGRICULTURE & NATURAL RESOURCES
BOARD OF MINERALS AND ENVIRONMENT

IN THE MATTER OF CLEAN NUCLEAR ENERGY CORP. URANIUM EXPLORATION PERMIT APPLICATION EXNI 453	))))))	Intervenor Response to answer Clean Nuclear Energy Corps Interrogatories & Requests for Production of Documents

To: Matthew E Naasz
Gunderson Plamer Nelson & Ashmore LP
Attorney for Clean Nuclear Energy Corp.

Comes now Caryn Lerman, Intervenor in the above titled manner with responses to Clean Nuclear Energy Corp Interrogatories & Requests for Production of Documents.

Interrogatory #1- I have many concerns about this project such as the historic archaeological & recreational significance, the long range effects to our domestic water wells and aquifer. But mostly I am writing for you to deny the exploration permit due to the adverse effects to threatened & endangered wildlife indigenous to the area.

In a Black Hills National Forest Environmental Assessment done in 2011 for the proposed expanded Craven Canyon Mineral Withdrawal, a variety of mammal, bird, amphibian and reptile species are listed. Some of these species use the area for breeding as well as foraging habitat. District records list prairie falcons and golden eagles nesting in the steep cliff habitat of Craven Canyon. Spade-foot toads have been recorded breeding in the intermittent ponds that occur after spring rains. The riparian habitat in the canyon bottom contains mature cottonwood trees which provide nesting and roosting habitat for species like Lewis woodpecker, northern flicker, and hoary bat. The scattered stands of mature, dense ponderosa pine provide habitat for the fringed myotis, brown creeper and northern goshawk. Other species that occur in the Craven Canyon vicinity include: prairie dog, badger, various species of bats, hawks, owls, swallows, grasshopper sparrow, meadow lark, rock wren, bobcats, coyote, mule deer, turkey, red squirrel, busy tailed woodrat, and other small mammals.

Four bat species and the bighorn sheep are considered Species of Local Concern (SOLC) and are known or strongly suspected to be present in the project area. Ground activities that cause vibrations associated with this project could result in nesting and roosting disturbances, affecting the viability of these species.

I**nterrogatory #2** – Not Applicable

Interrogatory #3 – I'm concerned about the impacts to engaged wildlife indigenous to this unique area. At this time its clear that SD Game, Fish & Parks has identified at least 3 categories of concern including; Ground Nesting Birds, Raptors & Bats, as evidenced by stated restrictions by Mandy Pearson on July 14th, 2025. Furthermore, SD GFP Website https://gfp.sd.gov/threatened-endangered/ during the Biennial Commission Review in September 2024, two different raptors, Osprey and Peregrine Falcons are listed on the State Threatened and Endangered Species list, with the Black Hills noted for their nesting ground.

I may or may not submit further documents by the stated deadline of December 1st

Interrogatory #4 – Caryn Lerman, Business Owner & SD Volunteer Naturalist. I am an Individual Intervenor.

Interrogatory #5 – Its ongoing and will be complete by stated deadline of December 1st

Interrogatory #6 – In the event that I plan to submit a non-expert witness, they will be named by the stated deadline of December 1st as indicated by the scheduling order.

Interrogatory #7 – N/A

Request for the Production of Documents

#1 - NA

#2 - Please find attached;

A) Copy of the report from SD Game Fish & Park.

B) Sections of the SD Game Fish & Parks Biennial Commission Review of SD Threatened and Endangered Species List from the September 2024 Commission Meeting, focused on the two raptors know to breed in the Black Hills. Further documentation will be submitted they will be named by that by Dec 1st as indicated by the scheduling order.

Submitted this 5th Day of November, 2025

By:_____

Caryn Lerman, Individual Intervenor
337 S. 5th Street Hot Springs, SD 57747

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Submitted this 5th Day of November, 2025

By: Caryn Lerman

Caryn Lerman, Individual Intervenor

337 S. 5th Street Hot Springs, SD 57747

Biennial Commission Review of SD Threatened and Endangered Species List
September 2024 Commission Meeting

SDCL 34A-8-4 states: The Game, Fish and Parks Commission shall conduct a review of the state list of endangered and threatened species within the period ending July 3, 1979, and every two years thereafter and may amend the list by appropriate additions or deletions.

In 2018, Wildlife Diversity staff drafted status reviews for all state threatened and endangered (T&E) species to describe the current level of knowledge and identify monitoring and research priorities needed to help develop and meet downlisting and delisting goals. If sufficient information allowed, downlisting and/or delisting criteria were identified. Downlisting a species changes its status from state endangered to threatened. Delisting a species removes it from the state T&E list.

Staff have identified state downlisting and/or delisting goals for 12 species. Five species are also federal listed, and state recovery will be linked to federal recovery goals. Four species lack sufficient information to allow setting downlisting and/or delisting goals.

Staff updated the status reviews in 2020, 2022 and 2024 to reflect completion of projects that provided revised survey or research information. Each status review includes a section that highlights any significant updates since 2020. Some overall highlights are described here:

- GFP continued contracting with peregrine falcon (state threatened) expert Bob Oakleaf of Lander, WY to search for and monitor nesting in western South Dakota, with an emphasis on the Black Hills. This species was downlisted from state endangered to state threatened in 2022 based on Oakleaf's monitoring data. Surveys continued in 2024 to assess the continued recovery of this species in western South Dakota.
- Additional survey results from 2023 were included for Least Tern, Piping Plover, American Dipper, Osprey, and False Map Turtle.
- Regional and statewide aquatic management plans now include commitments to standardize nongame fish sampling across the state, these plans were updated January 2024. These efforts have the potential to provide additional records for the state listed fish species.
- GFP funded a project to study the population structure of Sicklefin Chub (state endangered) and Sturgeon Chub (state threatened) in the Missouri River and its major tributaries to update information on distribution and status of these species from 2020-2022. On September 20, 2023, the U.S. Fish and Wildlife Service published a not-warranted 12-month finding after evaluating these species for potential Endangered Species Act listing.
- Lake Chub, a rare species in the Black Hills, was petitioned to be state listed endangered by a member of the public in August 2020. GFP funded a project to update information on the distribution and status of rare fishes in the Black Hills, including Lake Chub and Longnose Sucker, from 2021-2023. GFP has reviewed the status of Lake Chub and plans to continue to monitor Lake Chub as well as conduct trap and transfer efforts to establish additional populations in the Black Hills.

- A Wildlife Diversity Small Grant project surveyed sites within the Little Missouri River in 2023, which historically contained records for several rare species. No rare species were sampled.

For the 2024 biennial review of South Dakota's list of threatened and endangered species, Wildlife Diversity staff have no recommended status changes, additions or deletions.

Emphasis will continue to be placed on identifying and meeting information and data needs of currently state listed species to aid in developing and documenting downlisting and delisting criteria.

Document updated in 2024 by Chelsey Pasbrig, Jennifer Buchanan, and Eileen Dowd Stukel, SDGFP.

STATE THREATENED or ENDANGERED SPECIES
(as of September 2024)

COMMON NAME	SCIENTIFIC NAME	STATE STATUS
Fishes		
Banded killifish	*Fundulus diaphanus*	SE
Blacknose shiner	*Notropis heterolepis*	SE
Finescale dace	*Chrosomus neogaeus*	SE
Longnose sucker	*Catostomus catostomus*	ST
Northern pearl dace	*Margariscus nachtriebi*	ST
Northern redbelly dace	*Chrosomus eos*	ST
Pallid Sturgeon	*Scaphirhynchus albus*	SE
Sicklefin chub	*Macrhybopsis meeki*	SE
Sturgeon chub	*Macrhybopsis gelida*	ST
Reptiles and amphibians		
Eastern hog-nosed snake	*Heterodon platirhinos*	ST
False map turtle	*Graptemys pseudogeographica*	ST
Lined snake	*Tropidoclonion lineatum*	SE
Birds		
American dipper	*Cinclus mexicanus*	ST
Eskimo curlew	*Numenius borealis*	SE
Least tern	*Sternula antillarum*	SE
Osprey	*Pandion haliaetus*	ST
Peregrine falcon	*Falco peregrinus*	ST
Piping plover	*Charadrius melodus*	ST
Whooping crane	*Grus americana*	SE
Mammals		
Black-footed ferret	*Mustela nigripes*	SE
Swift fox	*Vulpes velox*	ST

SE = State Endangered; ST= State Threatened

STATE T&E SPECIES STATUS REVIEWS

- A status review was reviewed and updated as needed for each state threatened or state endangered species to summarize the current status of each in the state.
- If sufficient information existed, draft criteria for downlisting (changing status from endangered to threatened) and/or delisting (removing a threatened or endangered species from the state list) are described. If such information was lacking, the review describes additional monitoring or research needs.
- For species also listed as federal threatened or federal endangered under the federal Endangered Species Act, separate state recovery goals were not drafted. For those, SD Game, Fish and Parks (GFP) will continue cooperating with the U.S. Fish and Wildlife Service to meet identified recovery goals or assist in recovery planning, consistent with the "Cooperative Agreement between the U.S. Department of Interior Fish and Wildlife Service and South Dakota Game, Fish and Parks for the Conservation of Endangered and Threatened Animals." This agreement was approved on June 30, 1977 and has been updated annually since then.
- The authority for state threatened and endangered species conservation and recovery, including listings, delistings, and status changes, corresponds to the state's boundaries. South Dakota's state endangered species law does not require that the state list of threatened and endangered species agree with the federal list developed under the authority of the federal Endangered Species Act (ESA). Species that have been delisted under the ESA may be included on South Dakota's list because they remain rare within the state's boundaries, and federal listed species not considered rare within South Dakota's borders are not necessarily state listed.
- South Dakota's endangered species law is included in this document as Appendix A. The law can also be viewed here: http://www.sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=34A-8
- An additional law addressing black-footed ferret reintroduction is included in this document as Appendix B. The law can also be viewed here: https://sdlegislature.gov/Statutes/Codified_Laws/2064247
- These status reviews will be revisited at least every two years to comply with the biennial review schedule of the state list of threatened and endangered species by the GFP Commission.

Reviews are organized by species groups in the following order:

SPECIES	PAGE NUMBER
American dipper	6
Eskimo curlew	12
least tern	16
osprey	21
peregrine falcon	31
piping plover	38
whooping crane	44
banded killifish	48
blacknose shiner	52
finescale dace	57
longnose sucker	62
northern pearl dace	67
northern redbelly dace	71
pallid sturgeon	76
sicklefin chub	85
sturgeon chub	90
eastern hog-nosed snake	96
false map turtle	101
lined snake	107
black-footed ferret	112
swift fox	121
Appendix A. South Dakota Endangered Species Law	129
Appendix B. South Dakota Law Related to Black-footed Ferret Reintroduction	134

STATE T&E SPECIES STATUS REVIEW

Species Name: American Dipper, *Cinclus mexicanus*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:02. List of threatened birds)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank S2 (imperiled; state species rank last reviewed on 19 April 2020)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- Protected under the Migratory Bird Treaty Act (protection for covered birds, body parts, nests, and eggs)
- NatureServe Global Rank of G5 (Secure, although it may be rare in some portions of the range); global rank last reviewed 07 April 2016

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The American dipper was listed as state threatened in 1996 due to the species' declining distribution and isolated population in the Black Hills. Continued listing as a state threatened species is recommended.

Description, biology and life history:

The American dipper is a small, stocky gray bird with a short tail and long legs. It is named for its habit of bobbing up and down while foraging in streams. Sexes are similar in appearance, but the male is slightly larger than the female. Dippers have many contour feathers and a heavy layer of down that helps maintain body heat in cool temperatures.

Nesting occurs from April through July. Nests are dome-shaped and made of moss with grasses and pine needles used for lining. A typical clutch has 4-5 eggs that are laid in March or April. The female incubates the eggs while the male helps build the nest and provides food. Eggs will hatch after two weeks of incubation and young fledge at approximately 4 weeks old. After the young fledge, pairs may begin a second brood in May or June. Dippers are typically monogamous, but males have been documented being polygynous when nest sites are limited and concentrated (Backlund 2007). In the Black Hills, dippers generally remain in the same established territory for nesting over multiple years (Lovett 2009).

American dipper's primary prey is aquatic insects, including larval caddisflies and mayflies. Less commonly they will prey on small fish, larval amphibians and fish eggs (Kingery 1996). High mortality occurs during the winter and is likely related to the availability of ice-free streams required for foraging (Price and Brock, 1983).

Habitat:

The American dipper occupies habitats of clear, unpolluted, fast-moving streams that remain partially open to provide sustenance through the winter. In addition, dippers select rivers with a substrate of stone, gravel or sand that supports aquatic invertebrates which is their main food source. Dippers are rarely observed far from water and during flight seem to prefer following stream courses rather than flying over land. However, dipper will disperse over land to adjacent watersheds (Price and Brock 1983).

Nests are built over-water on both natural and human-made structures including cliffs, rock outcrops, boulders and bridges. Nest site availability is an important factor that may be limiting dipper populations in the Black Hills.

Distribution within the state.

The American dipper's easternmost part of its overall range occurs as an isolated population in the Black Hills (Willson and Kingery 2011). Dippers are non-migratory; however they will disperse to lower elevations during the winter. The American dipper population in the Black Hills is genetically distinct from populations in the west (Anderson et al. 2007). Dippers were once found along all larger rivers and streams throughout the Black Hills. Currently their population numbers around 50-75 individuals and is limited to the Spearfish Creek watershed and portions of Whitewood Creek in the northern Black Hill (Anderson et al. 2007).

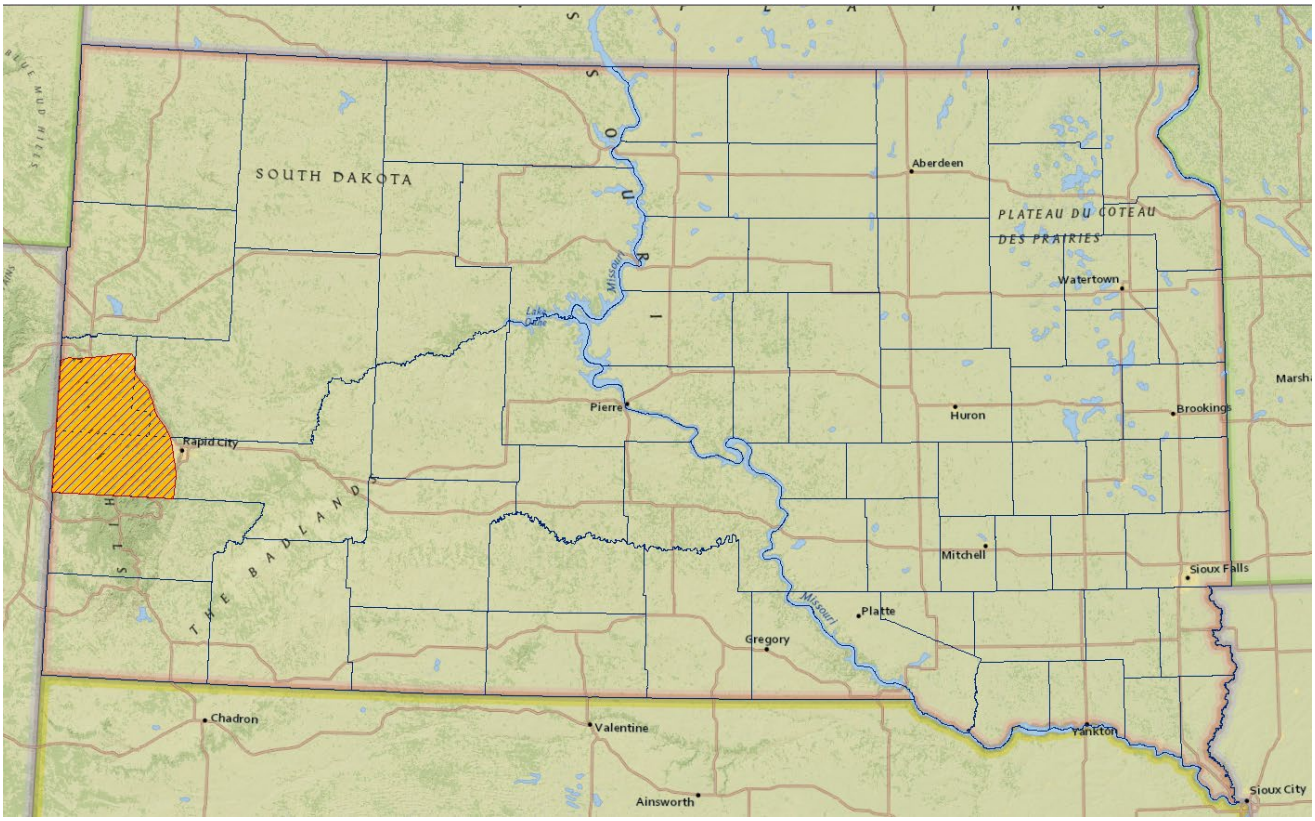


Figure 1. Year round distribution of the American Dipper (*Cinclus mexicanus*) in South Dakota.

Conservation / Management Considerations:

Population modeling conducted by Palmer and Javed (2014) found that American dippers in the Black Hills had higher survival rates but lower reproductive rates then other populations. A model that neglected age-structure differences in reproductive rates resulted in a less than 1% annual growth rate in the Black Hills dipper population, suggesting a delicate balance between population growth and decline. Given the relatively small population size and limited habitat, the dipper population in the Black Hills could be more susceptible to events such as flooding or extreme weather conditions.

Due to the species dependence on clear, cold, fast moving streams, any changes in water quality are a threat to the species. Sedimentation of streams destroys the habitat for most aquatic insects which dippers rely on for food. Some causes of sedimentation include livestock over use, logging of slopes near streams and building of roads along streams. Pollution from runoff, mining, agricultural practices or other sources can also be detrimental to dipper populations. The recent abnormal growth of a naturally occurring diatom, *Didymosphenia geminata,* is another threat to dippers and aquatic systems in the Black Hills.

American dippers were once prevalent on French and Rapid creeks. The absence of dippers on Rapid Creek is likely due to the creation of the Pactola Dam which has caused erratic and lower stream flows. The loss of breeding birds on French Creek is likely due to pollution, sedimentation, and the construction of Stockade Lake Dam (Backlund 2007). American dippers in the Black Hills were found to be generally tolerant of human activity as long as it is not excessive. The placement of nesting boxes on the underside of bridges over water can provide nesting opportunities where no natural nest sites exist.

Conservation Efforts in South Dakota:

- In 1997, the Department of Game, Fish and Parks with the assistance of the Spearfish Canyon Preservation Trust placed nest boxes for American dippers under bridges along Spearfish Creek. Since then, additional nest boxes have been placed along Whitewood and Rapid Creeks.

- From 2002 through 2005, 52 dippers were banded and monitored to assess dipper biology, habitat use, and movement in the Black Hills.

- In 2002 and 2005, feathers and blood samples were taken for DNA analysis. Results from the analysis suggested that the Black Hills population of American dippers is a distinct population of dipper.

- State Wildlife Grant Project T-17-R (2004-2009) intensive field monitoring took place to document nesting success, general behavior, longevity, dipper movement and territoriality.

- Macroinvertebrates were sampled from Spearfish and Whitewood creeks in 2009.

- Palmer and Javed (2014) modeled the long-term survival of the Black Hills American dipper population using data from the tracked 2002 color-banded cohorts.

- In 2015, as part of a collaborative climate change assessment, Amy Symstad (USGS, Northern Prairie Wildlife Research Center) conducted a Climate Change Vulnerability Assessment for the American Dipper and determined that they have a moderate vulnerability to climate change. The American dipper's adaptive capacity in the Black Hills is primarily hampered by its low population size and the lack of appropriate habitat if climate change makes its current habitat unsuitable (see Stamm et al. 2015).

- State Wildlife Grant Project T-76-R1 conducted surveys of selected Black Hills riparian areas for nesting American Dippers. Nest site occupancy and success were monitored in the current known breeding areas as well as any newly located sites to better describe the current distribution of American Dippers in the Black Hills of South Dakota.

- During the summer of 2019, local birding groups place 62 nest boxes at new sites and at existing sites to replace old boxes in need of replacement.

- SDGFFP and various agency and volunteer partners surveyed dipper nest sites during 2023. Results were as follows:

    - 18 active nests on Spearfish Creek, 2 successful; could not confirm all nests were successful
    - 2 active and successful nests on Whitewood Creek

- As of the late spring of 2024, the following results were available from 2024 surveys:

    - 18 active nests in Spearfish; two currently with nestlings
    - Whitewood Creek nests have not started yet

Recovery Criteria/Goals

For delisting there needs to be evidence of a self-sustaining population on Whitewood and Spearfish creeks for at least 5 years in a 6-year timespan. In addition there needs to be evidence of a self-sustaining population established on at least one additional river drainage over a similar timeframe.

A self-sustaining population is defined as one that maintains or increases its numbers over a period of time without significant human intervention (i.e., release of individuals to supplement population numbers), with the exception of birds produced by the use of human-made nesting structures.

Recovery Criteria Considerations:

Additional research and surveys are necessary to determine how many breeding pairs are necessary to obtain self-sustaining populations in each river drainage as well as:

- Determine what may be causing lower reproductive rates of dippers in the Black Hills compared to other populations.
- Have a better estimate of juvenile survival rate and its impact on dipper population dynamics.

- Influence of density dependence on reproductive rates if suitable nesting habitat is a limiting factor.
- Information on winter habitat availability, survival and movements.

Primary Reviewer:
Casey Heimerl, Wildlife Biologist, GFP, Pierre

Other Staff or Experts Involved in the Review:
- Nancy Drilling, wildlife biologist, Bird Conservancy of the Rockies, Rapid City, SD
- Doug Backlund, retired wildlife biologist, South Dakota Dept. of Game Fish and Parks, Pierre SD.

Date Review Finalized: 2020 (updated June 2024 – Jen Buchanan and Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018; approved by GFP Commission on April 5-6, 2018; 2020; and 2022.

References or Information Sources:

Anderson, T. 2002. Conservation assessment for the American dipper in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service Report. Custer, SD.

Anderson, C.M., G.M. Spellman, C.S. Ferrell, K. Strickler, and S.K. Sarver. 2007. Conservation genetics of American dipper (*Cinclus mexicanus*): the genetic status of a population in severe decline. Conservation Genetics 9(4):939-944.

Backlund, D. 2007. The American dipper *Cinclus mexicanus* in the Black Hills of South Dakota: past and present. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Drilling, N. E. 2019. Identification and Monitoring of American Dipper Populations and Inhabited Areas in South Dakota: Final Report. Bird Conservancy of the Rockies. Brighton, Colorado, USA.

Kingery, H.E 1996. American dipper (*Cinclus mexicanus*). *In* The Birds of North America, No. 229. (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA and The American Ornithologists' Union, Washington D.C.

Lovett, K. 2008. American dipper (*Cinclus mexicanus*) 2008 nest monitoring Spearfish Creek Watershed and Whitewood Creek in the Black Hills of South Dakota. Report to SD Dept. of Game, Fish and Parks, Pierre, SD.

Lovett, K. 2009. American dipper (*Cinclus mexicanus*) 2009 nest monitoring Spearfish Creek Watershed and Whitewood Creek in the Black Hills of South Dakota. Report to SD Dept. of Game, Fish and Parks, Pierre, SD.

Palmer, J.S. and J. Javed. 2014. An age-structured model for the American dipper in the Black Hills of South Dakota. Proceedings of the South Dakota Academy of Science 93:79-88.

Price, F.E. and C.E. Bock. 1983. Population ecology of the dipper (*Cinclus mexicanus*) in the Front Range of Colorado. Stud. Avian Bio. 7:1-84.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

Stamm, J.F., M.F. Poteet, A.J. Symstad, M. Musgrove, A.J. Long, B.J. Mahler and P.A. Norton. 2015. Historical and projected climate (1901-2050) and hydrologic response of karst aquifers, and species vulnerability in south-central Texas and western South Dakota. U.S. Geological Survey Scientific Investigations Report 2014-5089, 59p., plus supplements, http://dx.doi.org/10.3133/sir20145089

Wilson, M.F., and H.E. Kingery. 2011. American dipper (*Cinclus mexicanus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Available at http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/229.

SUMMARY OF UPDATES IN 2024:

- Added general survey results from 2023 and preliminary results from 2024.

STATE T&E SPECIES STATUS REVIEW

Species Name: Eskimo Curlew, *Numenius borealis*

South Dakota Status, including legal status and special listings:

- State endangered (SD Administrative Rule 41:10:02:01. List of endangered birds)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank SX (presumed extirpated)

Federal Status:

- NatureServe global rank GH (possibly extinct, some hope of rediscovery); last reviewed 9 April 2016
- Protected under the Migratory Bird Treaty Act (protection for migratory birds, body parts, nests and eggs)
- Federal endangered. This species was listed as endangered in 1967 pursuant to precursor legislation to the Endangered Species Act of 1973. Information on the species is insufficient for the development of a recovery plan.
- Listed as an Appendix I species under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) due to its extreme rarity among CITES-listed animals and plants. CITES prohibits the commercial international trade of specimens of Appendix I species.

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The specific justification for including the Eskimo curlew on the first list of endangered birds is unknown, but was likely done to reflect the federal status of the species and because sightings of this species were considered very rare even in the early 1900s. Continued state listing is recommended because the species faces a high probability of extinction.

The U. S. Fish and Wildlife Service (USFWS) believes the chances this species is extant are extremely low. However, uncertainty remains if it is extinct or not. There is enough uncertainty to keep the species as federal endangered because: 1) there have been several potential sightings within the last 15 years, 2) we don't know the best places to conduct surveys and, 3) the difficulty in differentiating between this and other *Numenius* spp. In the event that this species is declared extinct and removed from the federal list of threatened and endangered species, we will reassess whether continued listing under the SD endangered species law is warranted.

Description, biology and life history:

A 14" shorebird that is cinnamon-brown above and below with a slender, somewhat long, down curved bill. Crown is dark with a pale stripe. There are chevron marks on the breast and barring on the flanks. Legs are blueish-gray. Overall, the Eskimo Curlew looks similar to the Whimbrel.

Peak of nesting occurs from June through July in extreme northwestern Canada and northeastern Alaska. Four eggs are laid in a nest scraped into the ground lightly lined with leaves and/or grass. Little information is known about the breeding behavior of this species.

Fall migration occurs from July through October. Migrants fly southeast across northern Canada, towards Hudson Bay and to the Atlantic coast, fly over the Atlantic to South America where they continue overland crossing through the center of Brazil to the wintering grounds in southern Brazil, Uruguay, Argentina, Tierra del Fuego and Chile. Spring migration northward begins in March when birds fly along the Pacific coast of South America, over Central America and through the central United States where a northwesterly flight pattern takes them to breeding grounds.

Habitat:

Breeds in treeless tundra and grassy meadows. More specifically, heath and coastlines with crowberries are favored. During fall migration it is found using a variety of terrestrial and aquatic habitats and in some areas, observed in open fields. During spring migration it favors grasslands, pastures, plowed fields and at times marshes and mudflats; also shows preference for burned grasslands and marshes. In the United States, Eskimo Curlews have been reported to use old fields, pastures, meadows and sand dunes. This species eats a wide variety of insects as well as seeds and berries.

Distribution within the state:

The Eskimo curlew was once described as an abundant to common spring migrant in eastern South Dakota that followed river corridors in the tallgrass prairie and to a lesser degree mixed-grass prairie in late-March to mid-May. Specimen collected on 19 March 1878 near Pierre (Museum of Comparative Zoology, Harvard University). No records of this species are in the South Dakota Natural Heritage database. Current distribution is unknown.

Conservation / Management Considerations:

Eskimo curlew populations drastically declined as early as the late 1800's as the result of overharvest, habitat conversion from grassland to agriculture, fire suppression, change in available grasshopper prey (including the extinction of the Rocky Mountain grasshopper), and the reduced availability of insects uncovered by plows planting wheat in the fall instead of during curlew spring migration.

Few confirmed sightings and limited information on the basic biology of this species prevent effective conservation planning. The last confirmed sighting with physical evidence occurred in 1963 in Barbados. Other potential sightings (39) have been reported, most recently in 2006 in Nova Scotia, but these reports are not supported by physical evidence.

The USFWS initiated a 5-year status review in May of 2021. These reviews are conducted to determine if the status of the species should be changed or removed from the federal list. No new information was received and status of the species remains endangered (USFWS 2021).

Conservation Efforts in South Dakota:

Conservation of this species in South Dakota has occurred primarily by increasing awareness through education (Ashton and Dowd 2008, Stukel 2013). If a report of an Eskimo curlew is received by GFP, follow-up and request for photographs would be made. GFP would share this report with the USFWS and work cooperatively to confirm its validity.

Recovery Criteria/Goals

Recovery criteria are not proposed at this time. Refer to the Recovery Considerations section for more details.

Recovery Considerations

There are no federal recovery criteria. The USFWS does not recommend the development of conservation actions because of the extremely low likelihood that the species is extant. However, other existing shorebird conservation efforts would help this species. If species existence is confirmed, recovery plan development would be warranted. Well-designed and coordinated searches of known or suspected use areas should be conducted. Those areas that are thought to or known to be used by this species should be protected. Captive rearing should occur if an appropriate number of birds are found in the wild. Educational programs should be developed to increase public awareness of this species.

Primary Reviewer: Silka Kempema, wildlife biologist; reviewed and updated by Eileen Dowd Stukel, June 2024

Other Staff or Experts Involved in the Review: Eileen Dowd Stukel, senior wildlife biologist

Date Current Review Finalized: June 2024

Dates of Other Reviews, if appropriate:
2018; approved by GFP Commission in April.
2020; approved by GFP Commission in September
2022; approved by GFP Commission in September

References or Information Sources:

Andres, B. A., P. A. Smith, R. I. G. Morrison, C. L. Gratto-Trevor, S. C. Brown, and C. A. Friis. 2012. Population estimates of North American shorebirds, 2012. Wader Study Group Bulletin 119:178-194.

Ashton, D. E., and E. M. Dowd. 2008. Fragile legacy: Rare animals of South Dakota. Wildlife Division Report Number 91-04.

Gill, R. E. Jr., P. Canevari, and E. H. Iversen. 1998. Eskimo Curlew (*Numenius borealis*). In The Birds of North America, No. 347 (A. Poole, and F. Gill, eds. The Birds of North America, Inc., Philadelphia, PA.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org (accessed 5 November 2014).

Stukel, E. D. 2013. Eskimo curlew. Pages 28-29 in South Dakota Conservation Digest. Omaha Print.

U.S. Fish and Wildlife Service. 2021. Eskimo curlew (*Numenius borealis*) 5-year review: Summary and evaluation. U. S. Department of the Interior.

SUMMARY OF UPDATES IN 2024:

- South Dakota Natural Heritage Rank updated to SX (presumed extirpated).

STATE T&E SPECIES STATUS REVIEW

Species Name: Least Tern (*Sternula antillarum*)

South Dakota Status, including legal status and special listings:

- State endangered (SD Administrative Rule 41:10:02:01. List of endangered birds).
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3 (vulnerable; state rank last reviewed 2019)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)
- Originally listed as a subspecies (*Sterna antillarum athalassos*); taxonomy updated at GFP Commission meeting, November 2-3, 2017

Federal Status:

- Protected under Migratory Bird Treaty Act (protection for covered birds, body parts, nests, and eggs).
- NatureServe global rank G4 (apparently secure); global rank last reviewed 10 April 2016.
- Inland population, aka interior Least Tern, removed from federal listing as endangered due to recovery; effective February 12, 2021.

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The specific justification for including the Least Tern on the first list of state endangered birds is unknown but was presumably intended to mirror its federal status as an endangered species. Continued listing as a state endangered species is recommended.

Description, biology and life history:

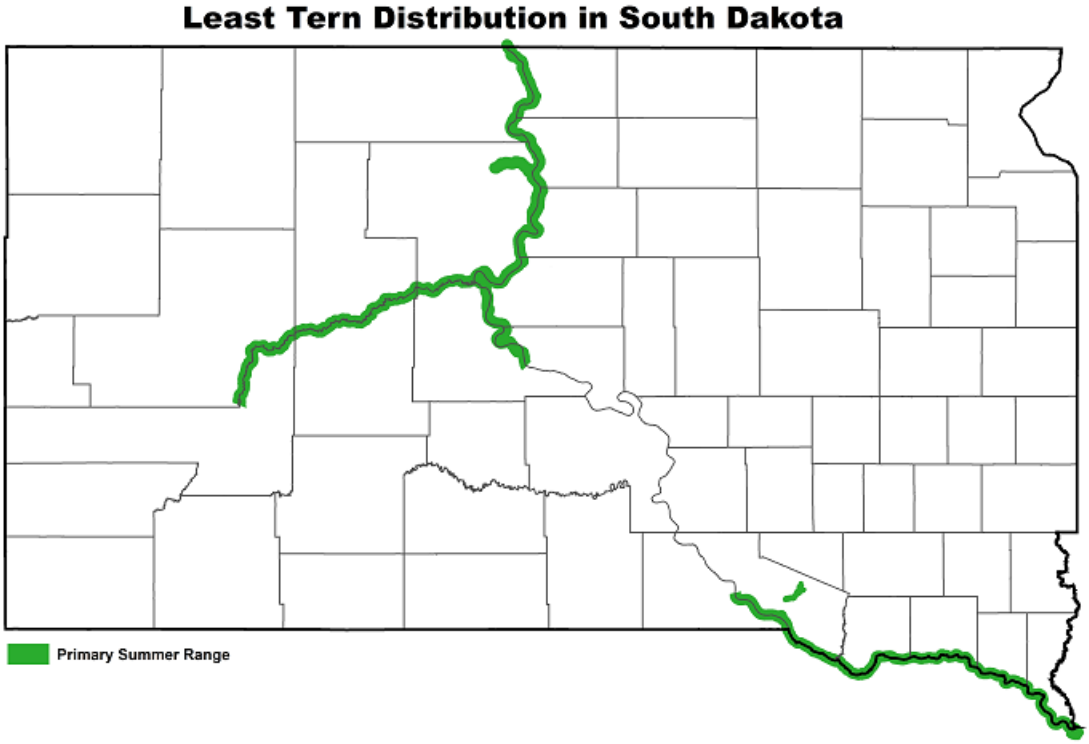
This smallest species in the gull and tern family measures 8-9 inches long and has a 20-inch wingspan. Adult males and females are similar in appearance, with a black crown, white forehead, gray back, gray wings above with white below, orange legs, and a black-tipped yellow bill. Immature birds have darker feathers, a dark bill, and dark eye stripes on white heads. Individuals begin breeding at 2-3 years of age. Least Terns arrive in South Dakota in early May and begin nesting in late May or early June in small, loosely-defined groups, often in association with Piping Plovers. This species has adapted to using both natural and human-created habitats and, in some areas outside South Dakota, it may nest on flat gravel rooftops.

Habitat:

The Least Tern is associated with large rivers. Nesting areas are barren, treeless beaches of sand, gravel, or shells; dry mudflats and salt flats; and sand and gravel pits along rivers. The nest is an inconspicuous scrape typically containing 2-3 eggs. Least Terns eat small adult fish, fingerlings, and crustaceans taken by diving from the air into shallow water. During the breeding season, they typically feed near the nesting colony.

Distribution within the state:

This species nests along the Missouri and Cheyenne rivers, with the majority nesting below Gavins Point Dam in southeastern South Dakota. For reasons that are unclear, the Cheyenne River's importance to nesting Least Terns has declined in recent decades.



Conservation / Management Considerations:

Potential nesting habitat for this species in the Northern Great Plains was drastically reduced with the construction of 6 major dams on the Missouri River, 4 of which were built in South Dakota. Dams have converted previous riverine habitats to lacustrine habitats and disrupted sediment deposition important for habitat creation. Threats to nesting colonies include mammalian and avian predators, unrestricted pets, recreationists who disturb incubating adults or destroy nests or chicks, hail or other severe weather, elevated water levels or natural flooding during the nesting season, habitat erosion, and vegetative encroachment/plant succession.

The federal Endangered Species Act of 1973, as amended, requires that the status of listed species be reviewed at least every 5 years. The USFWS began a 5-Year Review (Review) of the Least Tern in 2008 and published its findings in 2013 (USFWS 2013). The Review concluded that this species is operating as a metapopulation, population size has increased substantially, and population targets have been met in 3 of the 5 major drainages (Mississippi, Red, and Arkansas rivers). The Least Tern population in the Missouri River drainage has remained stable, despite extensive habitat creation and other management efforts. The Review further characterized the relative importance of the Missouri River drainage (Missouri, Loup, and Platte rivers) to the metapopulation by stating that this drainage supports less than 10% of the listed population.

The review recommended that the Least Tern be delisted due to recovery, following the accomplishment of the following:

1. Completion of a habitat-driven metapopulation model;
2. Development of conservation agreements for post-listing monitoring and management; and
3. Development of a post-listing monitoring strategy and plan.

In January of 2021, the U.S. Fish and Wildlife Service (USFWS) published a final rule that removed the inland population of the Least Tern, which includes South Dakota, from the federal list of endangered and threatened wildlife (USFWS 2021). The USFWS stated that this population has recovered and no longer meets the definition of an endangered species, threats identified at the time of listing have been eliminated or reduced, and this population has increased in abundance and range.

Conservation Efforts in South Dakota:

Past:

More than 90,000 acres of land were transferred from the U.S. Army Corps of Engineers (USACE) to the State of South Dakota as a result of the Water Resources Development Act of 1999. Land transferred to the State of South Dakota is managed by Wildlife and/or Parks and Recreation divisions of South Dakota Game, Fish and Parks (GFP). Two products resulted from GFP's expanded role in endangered species management along the Missouri River, an interagency Memorandum of Agreement (MOA) regarding endangered species protection and recovery along the river and a state management plan for the Least Tern and Piping Plover (state management plan) (Aron 2005).

The first 5-year Missouri River endangered species interagency MOA was finalized in 2001 and included specific and shared commitments of 3 agencies; GFP, USACE, and the USFWS. Subsequent MOAs included the National Park Service in addition to the original 3 agencies. MOA accomplishments by all participants included such activities as biological surveys and nesting season productivity for Least Terns and Piping Plovers within the portion of the Missouri River surveyed by the USACE and GFP, specific protocols or policies developed to help implement the MOA, outreach and educational efforts related to Missouri River endangered species, law enforcement efforts, and relevant Section 7 consultations among federal agencies.

As GFP assumed responsibility for additional ownership and management of lands along the Missouri River, concern increased about the possibility of needing permission for incidental take. State management plans were prepared for the 4 species covered by the MOA as part of an agency intention to submit a habitat conservation plan to allow incidental take of federal listed species. Management plans were prepared for the Pallid Sturgeon and Bald Eagle. Piping Plover and Least Tern were covered in one plan. The HCP was not formally pursued.

Ongoing:

The GFP Commission passed the following administrative rule in 1989 to provide added protection for Least Tern and Piping Plover nesting colonies in the state:

Administrative Rule 41:10:02:18. Harassment prohibited. Harassment of the nesting and rearing sites of the least tern, an endangered species, and the piping plover, a threatened species, is prohibited. The department shall post conspicuous signs near critical nesting and rearing sites on the sandbars and shoreline of the Missouri River to warn against entry during the nesting period.

The MOA has progressed through several iterations, with the most recent version finalized in 2015. Following coordination among the USACE, GFP, and USFWS, the 2015 MOA expired without renewal because of the successful partnership established among the agencies. GFP committed to continued support to the USACE with upper Lake Oahe nesting surveys by annually hiring an experienced contractor for that area of the state.

Nesting survey data are collected by state, federal, and tribal personnel. The most extensive nesting data are collected by the USACE. These data are collected in a systematic manner, with strict quality control measures, prior to incorporation into the USACE's endangered species data management system. This system is used to document USACE compliance with a Jeopardy Biological Opinion between the USACE and USFWS regarding Missouri River endangered species, to assist the USACE in implementing its Missouri River Recovery Program, and to assist the USACE in avoiding negative impacts to nesting colonies while making short- and long-term water management decisions. The USACE allows GFP to access the data management system to assist the South Dakota Heritage Database Manager and other GFP staff in conducting environmental review.

Following the federal delisting of the Least Tern, the USACE reduced nest monitoring for this species along the Missouri River system. An adult census for Least Terns conducted from June 19 – 30, 2023 resulted in total adult count of 1,300 birds, an 18% increase from 2022 and the highest Missouri River adult Least Tern count since monitoring began in 1993. Habitat restoration included herbicide application to 2,638 acres and prescribed burning of 80 acres to maintain or increase emergent sandbar habitat (Hofer 2023).

Future:
GFP will continue providing nesting survey support on upper Lake Oahe by annually hiring an experienced contractor to work with the USACE survey crew. GFP will continue using nesting season data provided by the USACE and other sources for environmental review.

State Recovery Criteria/Goals:
GFP has not had the opportunity to gather sufficient information or solicit feedback from species experts to formulate state downlisting and delisting goals.

Primary Reviewer:
Eileen Dowd Stukel, Senior Wildlife Biologist, SD Game, Fish and Parks, Pierre

Date Updated Review Finalized: June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018, 2020 and 2022

References or Information Sources:

Aron, C. 2005. South Dakota Interior Least Tern (*Sterna antillarum athalassos*) and Piping Plover (*Charadrius melodus*) Management Plan. South Dakota Department of Game, Fish and Parks, Pierre, Wildlife Division Report No. 2005-02, 76 pp.

Hofer, C. 2023. USACE Missouri River tern and plover monitoring, Section 10 Sampling Permit Reporting – 2023. U.S Army Corps of Engineers, Omaha District. 13 pages.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

U.S. Fish and Wildlife Service (USFWS). 1990. Recovery plan for the interior population of the least tern (*Sterna antillarum*). U.S. Fish and Wildlife Service, Twin Cities, Minnesota. 90 pp.

U.S. Fish and Wildlife Service (USFWS). 2013. Interior least tern (*Sternula antillarum*), 5-Year Review: Summary and evaluation. USFWS, Southeast Region, Jackson, MS. 71 pp.

U.S. Fish and Wildlife Service (USFWS). 2021. Endangered and threatened wildlife and plants; Removal of the interior least tern from the federal list of endangered and threatened wildlife. 86 FR 2564; document number 2020-28192, pages 2564-2581.

SUMMARY OF UPDATES IN 2024:

- Adult count reported by USACE for Least Terns in 2023 for monitored area along Missouri River.

STATE T&E SPECIES STATUS REVIEW

Species Name: Osprey, *Pandion haliaetus*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:02. List of threatened birds)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3 (vulnerable; state rank last reviewed in 2020)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- Migratory bird under Migratory Bird Treaty Act (protection for covered birds, body parts, nests, and eggs)
- NatureServe global rank G5 (secure); global rank last reviewed 9 April 2016

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The justification for including the Osprey on the first list of state threatened birds is unknown, but was presumably due to rarity, limited distribution, and evidence of historical nesting in the state. Continued listing as a state threatened species is recommended at this time.

Description, biology and life history:

This large, dark brown and white raptor has a wingspan of 63 inches. The adult has a white crown, dark eyestripes, and yellow eyes. The juvenile has a streaky crown and nape, eyes that are red to orange, and a scaly appearance to the plumage. Wings are long and pointed, with a dark wrist patch at the bend of the wing. Ospreys are typically at least 3 years old before breeding. Individuals are faithful to nest sites, which contributes to mate fidelity. The female lays 2-4 eggs and handles the majority of the 5-6 week incubation duties. Ospreys prey almost exclusively on fish, typically on whatever is most available and catchable in shallow water or near the surface.

Factors that influence breeding success:

Poole (1989) listed 3 ways to describe breeding success: average number of young fledged per successful nest; number of young fledged per active nest; and young fledged per occupied nest. An active nest has incubating parents, eggs, or young. A successful nest has at least 1 fledged young.

Ospreys typically lay 3 eggs per clutch. Poole (1989) mentioned 2 limits to Osprey brood size. The quality of young declines as brood size increases. The larger the brood, the more weight the parents lose. Weather affects nesting success by influencing the male's ability to hunt and the earliest time the female can begin laying eggs. Laying dates explain more variation in breeding success than age or mate retention. Young that hatched early in the

nesting season survive to breeding age with more success than young that hatch later, possibly due to the longer time available to them prior to their first migration. Poole (1989) also reported that breeding success is higher as the nesters' ages increase and when the mate from the previous season is retained. An experienced male contributes strongly to a pair's breeding success, even with an inexperienced female, but the reverse is not true.

Poole (1989) stated that Osprey populations are regulated by birth and death rates, how far birds disperse from natal and breeding areas, when birds start breeding, and the number of pairs the habitat can support. Because males are more likely to nest near their natal sites, local reproduction helps determine population stability. Age at first breeding likely varies with availability of nesting sites. The number of young needed to be produced per nest for population stability may be higher in areas where Ospreys begin nesting later due to limited nest sites. Ospreys using artificial sites tend to rear more young than adults using natural sites, due to loss of natural nests to blow downs and possibly easier tree nest access for predators. The use of nesting platforms and other artificial nest sites has allowed Ospreys to concentrate and to exploit new habitats, such as urban areas and shallow wetlands.

Poole (1989) described the Osprey's nesting success cycle as centered on areas with sufficient numbers of safe nest sites. Males tend to return to the same areas to nest, with these new recruits supporting an expanding population. By using safe nest sites, birds may begin nesting at an earlier age, which lowers the breeding rate needed to stabilize a population. As a population grows, nest sites become more limited, causing birds to disperse farther, delay breeding, and begin using more marginal sites.

Threats:

Poole (1989) described the importance of Ospreys as indicators of environmental contamination, forest conditions, fisheries status, and human attitudes to wildlife. Raccoons are a threat to accessible nests. Nest visits by humans cause a certain amount of disturbance. Techniques include using a mirror mounted on a pole to view nest contents and nest visits to count eggs and young and collect prey remains, addled eggs, and data on growth and condition of young. Aerial surveys of nests with helicopters may cause less disturbance than visits involving direct access. The use of drones as a survey technique has shown some promise for this species (Junda et al. 2015). Boaters or others lingering near nests can disturb nesting pairs. The impact of disturbance depends on the timing and the pair's level of acclimation to that disturbance type.

Poole (1989) also summarized knowledge of contaminant impacts to Ospreys. Organochlorine compounds, such as DDT, dieldrin, aldrin, heptachlor, and PCBs are most harmful because of their stability, widespread dispersal, tendency to be trapped in fatty tissues, and propensity to bioaccumulate. These compounds cause reduced egg viability at very low concentrations. Birds cannot metabolize or excrete them, although a female excretes a portion of these compounds into the yolks of her eggs. Contaminant impacts to Osprey populations are magnified by the species' limited immigration, due to their tendency to return to natal sites to nest. Mercury can be a localized problem for Ospreys, although it can be excreted by moving from the blood to growing feathers.

Habitat:

Ospreys are associated with aquatic habitats, such as lakes, large rivers, and coastal bays. They build a large stick nest at the top of a large living or dead tree near wetlands. The nest site is in an open area to allow this large raptor to maneuver around the nest. Nest trees are typically higher than surrounding trees. Birds may also nest on cliffs, utility poles, cell towers, and other tall, human-made structures. Ospreys generally reuse the same nest.

Within the Black Hills, 5 Osprey pairs built nests adjacent to water treatment plants with surface ponds. Presumably the pairs were attracted to water bodies, as the ponds do not contain fish (Shelly Deisch, personal communication, 2015). Some Osprey nests in the Black Hills are in less typical sites, such as within moderate tree crown closure, likely due to such factors as human developments associated with reservoirs, presence of stocked trout, and tall powerlines within pine forests of the Black Hills. However, these sites are in nest trees that are typically higher than surrounding trees. Osprey use of natural nest sites (ponderosa pine) in the Black Hills fluctuates due to poor nest support and short duration of standing snags (Shelly Deisch, personal communication, 2017).

Distribution within the state.

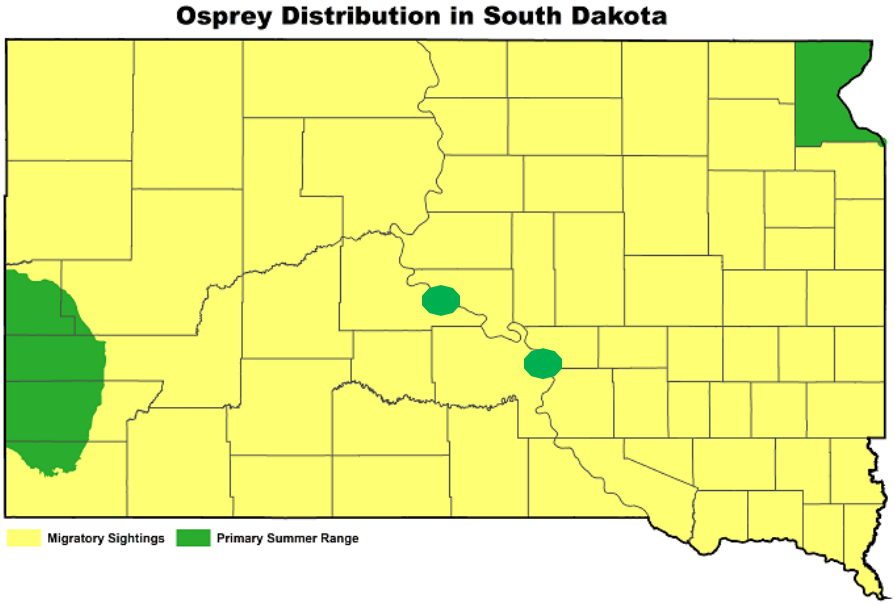
The majority of Ospreys in South Dakota nest in the Black Hills and surrounding areas. In this context, GFP considers the Black Hills as the fire-protection boundary (https://denr.sd.gov/des/aq/bhfpb.aspx). The population has grown slowly from the first successful nest documented in the South Dakota portion of the Black Hills at Pactola Lake in Pennington County in 1991. The source of this pioneering pair is unknown, although there was speculation at the time that they originated from the Keyhole Reservoir in northeastern Wyoming.

At least 3 pairs have nested in Roberts County in northeastern South Dakota. One-two pairs nest consistently on nesting platforms at the Big Stone Power Plant property in the extreme southeastern portion of Roberts County, although both nests are not always active each year (various Big Stone Power Plant staff, personal communications).

The presumed source of the northeastern South Dakota pairs is an expanding population in Minnesota. Additional summer observations are reported, particularly in this general area and at various places along the Missouri River, but many reports are of birds seen during the summer without nest locations provided.

An osprey reintroduced in South Dakota was part of a nesting pair at Big Bend Dam near Fort Thompson in 2017. This nest has been monitored by GFP employee Brent Vander Ley, among others. Vander Ley reported that the nest has been active for a number of years, but not successful until 2017, when 4 young were fledged. The reintroduced bird (color leg band code 5E) was collected from a nest at Cougar Bay, near the mouth of the Spokane River in Idaho on July 20, 2010 and taken to the hack site at Lake Yankton near Gavins Point Dam. Based on size, 5E is assumed to be a female. Its 2017 mate was also banded on both legs, but its identity was not determined. Interestingly, this same bird (5E) was photographed on

October 31, 2010 and December 18, 2010 by Alexander Dzib at the Celestun Estuary on the Yucatan Peninsula, Mexico.



Conservation / Management Considerations:

A GFP Wildlife Biologist and GIS Program Specialist in Rapid City have worked closely with Black Hills National Forest, Black Hills Energy, Black Hills Electric Cooperative, Butte Electric Cooperative, and various communities and landowners in the Black Hills to resolve existing and potential conflicts from Osprey nest placement. These efforts are designed to alleviate bird electrocutions, risks of fires or power outages, and avoid conflicts in areas with extensive public use. These ongoing coordination activities also include technical assistance regarding appropriate nesting platform design, placement, and relocation when necessary. A related opportunistic activity is the placement of nesting platforms along lakes that have been dredged for sediment removal, in cooperation with Black Hills National Forest. In Rapid City, Osprey nesting platforms have been placed at various sites with public accessibility to take advantage of the value of public education and watchable wildlife viewing opportunities.

Black Hills Osprey nests are negatively impacted by the incorporation of plastic baling twine and fishing line into nests. Baling twine has been seen in platform nests, although no Osprey in the area has yet been observed entangled in the twine. At least one Osprey was found dead after she became entangled in fishing line and hung until death. Other Black Hills Osprey challenges include severe weather, particularly thunderstorms, high winds, and hail (Shelly Deisch, personal communication, 2017).

Nesting sites used by Ospreys in South Dakota have not yet resulted in significant conflicts with recreationists regarding disturbance of nesting pairs. Several nesting pairs in the Black Hills that tolerate relatively high human disturbance provide a wonderful opportunity for

wildlife viewing for residents and visitors in the area (Shelly Deisch, personal communication, 2017).

One area of concern is the potential for conflicts with Ospreys nesting near commercial facilities that rear trout or provide trout for paid fishing opportunities. GFP and other agencies address these situations on a case-by-case basis to try to alleviate monetary impacts to businesses while promoting the continued expansion of Ospreys in the Black Hills and surrounding areas. Locations of public and private fish hatcheries are considered when nests are relocated or new nesting platforms are erected.

GFP operates 2 fish hatcheries in the Black Hills - McNenny and Cleghorn Springs. Although McNenny has experienced considerable Osprey depredation in the past, staff have developed a technique involving floats and lines to simulate the appearance of swimming pool lanes. This method has dramatically decreased losses to Ospreys. Although somewhat inconvenient for hatchery staff activities, this compromise has allowed Ospreys to be accommodated for their watchable wildlife value. All of Cleghorn's rearing facilities are indoors or covered, making bird depredation impossible. Ospreys are not collected under a federal depredation permit at these facilities (Mike Barnes, personal communication, 2020).

Following 3 years of monitoring a subset of Osprey nests in the Black Hills, Engler and Halverson of Avian Research and Consulting (2013) offered the following recommendations, quoted in italics, followed by GFP commentary when appropriate:

- *Utility companies upgrade all nesting platforms to an offset type* (Figure 1)*;*
  Prior to 2014, most nesting platforms were based a center-pole design, which has proven to be problematic when access is needed to remove fishing line or baling twine. Many platforms are in inaccessible areas with saturated soils, making access with a boom-equipped truck difficult during the spring and summer. An offset platform allows a certified climber to access nests for emergency or research purposes. GFP has a partnership with utility companies to switch to nesting platforms with an offset design and larger platform space. In 2015-2016, GFP and utility companies replaced several center-mounted platforms with offset platforms with 90-degree perches designed by GFP. The new platforms are larger and deeper to help reduce nest lost in high winds, and perches will not get covered as the nest enlarges.
- *Interpretive signage be installed at selected nesting sites to inform the public about ospreys in the Black Hills;*
  See Conservation / Management Considerations section for discussion of potential sites in Rapid City.
- *Future power structure sites be surveyed for suitability as osprey nesting sites and appropriate platforms be installed to discourage nesting on the power structures;*
  GFP has provided these comments during environmental review of proposed new powerlines throughout the greater Black Hills. Some powerline areas will still be managed on a reactive basis and other areas will have deterrents pro-actively installed by the companies when powerlines are being retrofitted or are non-energized.
- *Specific surveys or evaluation be conducted to determine the extent of osprey predation on trout at commercial fish operations in the Black Hills.*

The South Dakota Department of Environment and Natural Resources (DANR) monitors water quality in a variety of ways, such as ambient water quality monitoring in lacustrine and riverine systems (http://denr.sd.gov/linkswaternav.aspx). In addition, DANR, GFP, and the SD Department of Health cooperate on the collection, sampling, and public information sharing regarding fish sampling to assess human consumption risks, such as elevated mercury concentrations (http://denr.sd.gov/des/sw/fish.aspx). If Osprey nesting success declines in a significant way, water quality measures will be considered as potential information sources.

Conservation Efforts in South Dakota:

Past:

GFP reintroduced 120 Ospreys along the Missouri River in southeastern South Dakota, an area where this species historically nested (Agersborg 1885). Young birds, primarily from the Coeur d'Alene, Idaho area, were reintroduced from 2003 – 2006 and from 2008 – 2010 (Dowd Stukel et al. 2011). Nesting platforms were subsequently placed near Gavins Point Dam, close to the site of the most recent reintroductions (Figure 2).

Trout are not native to South Dakota. Brook Trout (*Salvelinus fontinalis*) were introduced to the Black Hills in 1886, Rainbow Trout (*Oncorhynchus mykiss*) were introduced in 1896, and Brown Trout (*Salmo trutta*) and Cutthroat Trout (*S. clarkii*) were introduced in 1898 (Cordes 2007). GFP contracted with Jennifer Fowler through the Wildlife Diversity Small Grants Program to conduct a short-term investigation of the foraging behavior of Ospreys in the Black Hills, particularly related to trout fisheries (Fowler 2006). The investigation involved observations concentrated at 3 Osprey nests, at Pactola, Bismarck, and Center lakes, all of which are stocked with Rainbow Trout by GFP. Fowler concluded that the average number of fish caught per day based on observations was 6.63, with trout comprising 66% of captured fish (n=44). Trout observed being caught by Ospreys during the investigation were 12 inches or less, indicating that the birds were catching stocked trout rather than trophy-sized trout. The investigation did not include an assessment of available fish to allow a comparison of trout taken to the proportion of trout in these lakes. Other fish species observed being captured by Ospreys were Yellow Perch (*Perca flavescens*), Northern Pike (*Esox luciens*), Largemouth Bass (*Micropterus salmoides*), an unidentified species of sucker, and other undetermined fish species (Fowler 2006).

GFP contracted with Avian Research and Consulting (ARC), LLC, in Rapid City from 2011 – 2013 to assist with nest monitoring in the Black Hills, gather biological information on monitored nests, and describe population trends. ARC monitored 15 nests in 2011, 10 nests in 2012, and 13 nests in 2013. An additional 5 nests were monitored in the Black Hills by GFP in 2012. Numbers of young observed at monitored nests were 20-21 in 2011, 26-27 in 2012, and 25 in 2013 (Engler and Halverson 2013).

Poole et al. (2002) summarized that various studies have shown that Ospreys need to produce 0.8 – 0.9 young per active nest to achieve population stability. However, Poole (1989) described the variables that influence this estimate, such as age at first breeding and availability of nest sites. Assuming most young observed during the 2011-2013 monitoring project by ARC survived to fledging, these figures indicate the Black Hills osprey population was increasing during that survey period.

GFP contracted with John Halverson to survey and report on nest success for known and possible Osprey nests in the Black Hills of South Dakota during 2018 and 2019. Of 39 possible nests surveyed in 2018, 23 were active, and 1 was abandoned. Of this set of 24 nests, 20 were on artificial structures, and 4 were in live or dead trees Twenty-three active nests produced 34 fledglings. Seventeen of these active nests produced at least 1 fledgling (Halverson 2019). Halverson surveyed 44 possible nests in 2019 and found 26 to be active and 1 abandoned. The 27 active or abandoned nests were on artificial structures (19) or in live or dead trees (8). Twenty-six active nests produced 16 fledglings. Fourteen of these active nests produced at least 1 fledgling. Halverson reported that 2019 nesting was heavily influenced by repeated snowfalls early in the nesting season and severe summer weather that included heavy rainfalls, cool weather, and hail events (Halverson 2019).

Ongoing:
GFP's website contains information about the Missouri River reintroduction project (Dowd Stukel et al. 2011).

GFP will continue to gather information on nesting locations and nest success opportunistically from bird watchers, landowners, land management agencies, and agency staff.

Activities described for the Black Hills Osprey population are ongoing as the population appears to be slowly increasing annually and as new nests on powerlines or other human-made structures must be addressed.

Nest Surveys from 2023 resulted in 47 total nesting locations for future monitoring. Twenty-six nests within the Black Hills were successful in producing 57 fledglings. One successful nest along the Missouri River in central South Dakota produced two fledglings.

Future:
Using established protocols, GFP will regularly conduct specific nest monitoring with agency staff or by contract to assess the status of the nesting population in the Black Hills and gather sufficient data to assess whether the species has met delisting criteria.

GFP will assess the feasibility of an Osprey nest watch program using agency staff, volunteer landowners, and birdwatchers for monitoring specific nests to determine nesting status and production.

GFP will continue to collect reports of summer season observations outside the known range of this species and follow up on promising reports of possible new nesting areas, if feasible, with aerial or boat searches.

GFP will evaluate the need to place additional nesting platforms in the vicinity of the Big Stone Power Plant and/or reintroduce additional young Ospreys to eastern South Dakota to attempt to encourage growth of this secondary population. Based on the scarcity of reports

outside the Black Hills and central South Dakota, GFP likely needs to take a more active approach to documenting Osprey nesting in areas besides the Black Hills.

Recovery Criteria/Goals

For delisting, South Dakota's Osprey population should consist of an average of at least 20 active nests in the Black Hills for at least 5 years in a 7-year timespan and a second group of an average of at least 6 active nests outside the Black Hills for at least 5 years in a 7-year timespan. An active nest is one that is claimed or built by a pair that lays eggs during that nesting season.

At least 75% of the Black Hills nests should be successful (produce at least 1 fledged young) during the timespan considered. At least 4 of the 6 nests outside the Black Hills should be successful (produce at least 1 fledged young) during the timespan considered.

Primary Reviewer:

Eileen Dowd Stukel, Senior Wildlife Biologist, SD Game, Fish and Parks, Pierre

Other Staff or Experts Involved in the 2018 Review:

Will Sayler, Fisheries Program Administrator, GFP, Pierre
Shelly Deisch, Wildlife Biologist/Forest Service Liaison, GFP, Rapid City
Samantha Nichols, Regional GIS Program Specialist, GFP, Rapid City
Wayne Melquist, PhD, CREX Consulting, St. Maries, Idaho
Silka Kempema, Wildlife Biologist, GFP, Pierre

Date Review Finalized: 2022; Updated June 2024 by Jen Buchanan and Eileen Dowd Stukel

Dates of Other Reviews, if appropriate: 2018, 2020, and 2022.

References or Information Sources:

Agersborg, G. S. 1885. Birds of Southeastern Dakota. Auk 2:276-289.

Backlund, D. GFP Wildlife Biologist (retired) and contractor, Pierre, SD.

Cordes, R. J. 2007. Cold-water fish species. Pages 201-211 *in* C. R. Berry, Jr., K. F. Higgins, D. W. Willis, and S. R. Chipps, Editors, History of Fisheries and Fishing in South Dakota. South Dakota Department of Game, Fish and Parks, Pierre.

Deisch, M. (Shelly). GFP Wildlife Biologist, Rapid City, SD.

Deisch, M. (Shelly). 2020. Compilation and analysis of Osprey nests in Black Hills of South Dakota from multiple sources. SD Dept. of Game, Fish and Parks, Rapid City.

Dowd Stukel, E., W. Melquist and C. West. 2011. Reintroduction of osprey into suitable sites along the Missouri River in South Dakota. Final Report Submitted to U.S. Fish and Wildlife Service for Grant Number T-10-R-1. https://gfp.sd.gov/images/WebMaps/Viewer/WAP/Website/SWGSummaries/T-10-R/Osprey-final-report_T-10.pdf accessed 13 June 2024.

Endrizzi, J. Plant Manager, Big Stone Power Plant, Big Stone City, SD.

Engler, M. and J. Halverson. 2013. Osprey Monitoring Project – Summary of field activity through September 30, 2013. Report to South Dakota Game, Fish and Parks by Avian Research and Consulting, L.L.C.

Fowler, J. A. 2006. Foraging behavior of ospreys (*Pandion haliaetus*) in the Black Hills of South Dakota. Report for the South Dakota Natural Heritage Program, SD Department of Game, Fish and Parks.
Froiland, S. G. 1990 Natural history of the Black Hills and Badlands. Center for Western Studies, Augustana College, Sioux Falls, SD.
Halverson, J. W. 2019. 2018-2019 Osprey Survey Final Report. Report submitted to South Dakota Department of Game, Fish and Parks.
Junda, J., E. Green, and D. M. Bird. 2015. Proper flight technique for using a small rotary-winged drone aircraft to safely, quickly, and accurately survey raptor nests. Journal of Unmanned Vehicle Systems 3(4): 222-236, https://doi.org/10.1139/juvs-2015-0003.
Kempema, S. GFP Wildlife Biologist, Pierre, SD.
Melquist, W. E. CREX Consulting, St. Maries, ID.
Nichols, S. Regional GIS Program Specialist, GFP, Rapid City
Poole, A. F. 1989. Ospreys: A natural and unnatural history. Cambridge University Press.
Poole, A. F., R. O. Bierregaard, and M. S. Martell. 2002. Osprey (*Pandion haliaetus*). *In* The Birds of North America, No. 683 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
Sayler, W. GFP Fisheries Program Administrator, Pierre, SD.
South Dakota Natural Heritage Program. 2018. Rare Animals of South Dakota. South Dakota Game, Fish and Parks, Pierre, South Dakota. https://gfp.sd.gov/rare-plants/. Accessed 26 June 2020.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

SUMMARY OF UPDATES IN 2024:

- General summary of successful nesting in 2023 included.

Figure 1. Osprey nest platform with offset design

Source of image: www.osprey-watch.org

Figure 2. Nest platform installation (similar design used near site of Yankton, South Dakota area osprey reintroductions)

STATE T&E SPECIES STATUS REVIEW

Species Name: Peregrine Falcon, *Falco peregrinus*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:02. List of threatened birds)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank S1 (Critically imperiled breeding population; state rank last reviewed 31 Jan 2021)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- Protected under the Migratory Bird Treaty Act (protection for covered birds, body parts, nests, and eggs).
- NatureServe Global Rank G4 (Apparently secure, although it may be rare in some portions of the range); global rank last reviewed 07 Apr 2016

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The Peregrine Falcon was included on the list of state endangered birds because it was once federally listed, and breeding populations were historically found in the state. The status of this species was changed from state endangered to state threatened in 2022 when nest monitoring demonstrated downlisting criteria were met. Continued listing as a state threatened species is recommended.

Description, biology and life history:

Large falcon with long, pointed wings, a long narrow tail, and a rapid wingbeat. When perched, wingtips nearly reach tip of tail. Sexes are similar in appearance; however the female is approximately 20% larger than the male. Adults are blue-gray above with a blackish facial malar stripe extending down from the eye. Underparts are whitish-grey with a variable amount of dark barring and spotting. Under tail and under wing coverts are barred. The upperparts of juveniles are pale to slate brown and underparts are buffy with streaking patterns instead of the barring of adults (White et al. 2002).

Instead of building nests, peregrines use scrapes of loose material to form a depression. Males typically make several scrapes and the female will select which to use for egg laying. One brood is fledged per year, typically with a clutch size of 3-4 eggs that hatch after 33-35 days. Renesting may occur if clutches are removed or lost early in the incubation period. Breeding pairs and individuals often show strong nest site fidelity.

During the breeding season peregrines will strongly defend the area surrounding their nest site. As the distance from the nest increases, territoriality decreases and most often occurs over food or preferred perch sites (Cade 1960). Size of territories varies by location and may be influenced by prey availability. Barnes et al. (2015) reported the closest distance eyries, or nesting locations, were from neighboring territories was 1.2 km for peregrines nesting in the

Lake Mead National Recreation Area. In central West Greenland, Wightman and Fuller (2005) found the average distance of an eyrie to the nearest neighbor was 3.27 km and ranged from 1.3-11.2 km.

A majority of the peregrine's diet consists of birds and on rare occasions small mammals. In urban areas pigeons and doves make up a large portion of the diet. Peregrines search for prey while flying or from perches that offer a high vantage point. Hunting is most often done in the air by conducting stoops on lower flying prey.

Predators of adults are primarily large raptors including great horned owls, eagles, and gyrfalcons. Nestlings or juveniles have a wider array of predators including other peregrines and many mammalian nest predators. In many reintroduction efforts, eagles and great horned owls are the primary predators on the young (Cade et al. 1988). Other causes of mortality in urban locations include collisions with automobiles and windows or drowning after fledging from bridges (Cade and Bird 1990). In non-urban environments mortality can be caused by collisions or electrocution from power lines, wire or fence collisions or illegal shooting (Barclay and Cade 1983).

Habitat:

The peregrine's natural habitat consists of tall cliffs for nesting with open landscapes for foraging. Nests are often established on cliffs at heights ranging from 50 to 200 meters. Preferred nesting sites provide isolation from mammalian and avian predators and are in close proximity to an abundant prey base (Oakleaf 2017).

Peregrines have become adapted to artificial habitat in urban areas and will establish nests on human-made structures such as tall buildings, towers and bridges.

Distribution within the state.

Currently the peregrine is a rare summer resident of the Black Hills and an uncommon statewide migrant. Historically there was a limited nesting distribution in western South Dakota with only two confirmed nesting records at separate locations in 1925 and 1948-1960 (Patton 1926, Pettingill and Whitney 1965). Since then, there were no known nesting records until recently, when surveys for peregrines in the spring and summer of 2017 documented two confirmed and one potential nest locations in the northern and central Black Hills (Oakleaf 2017). See Conservation Efforts section for more information.

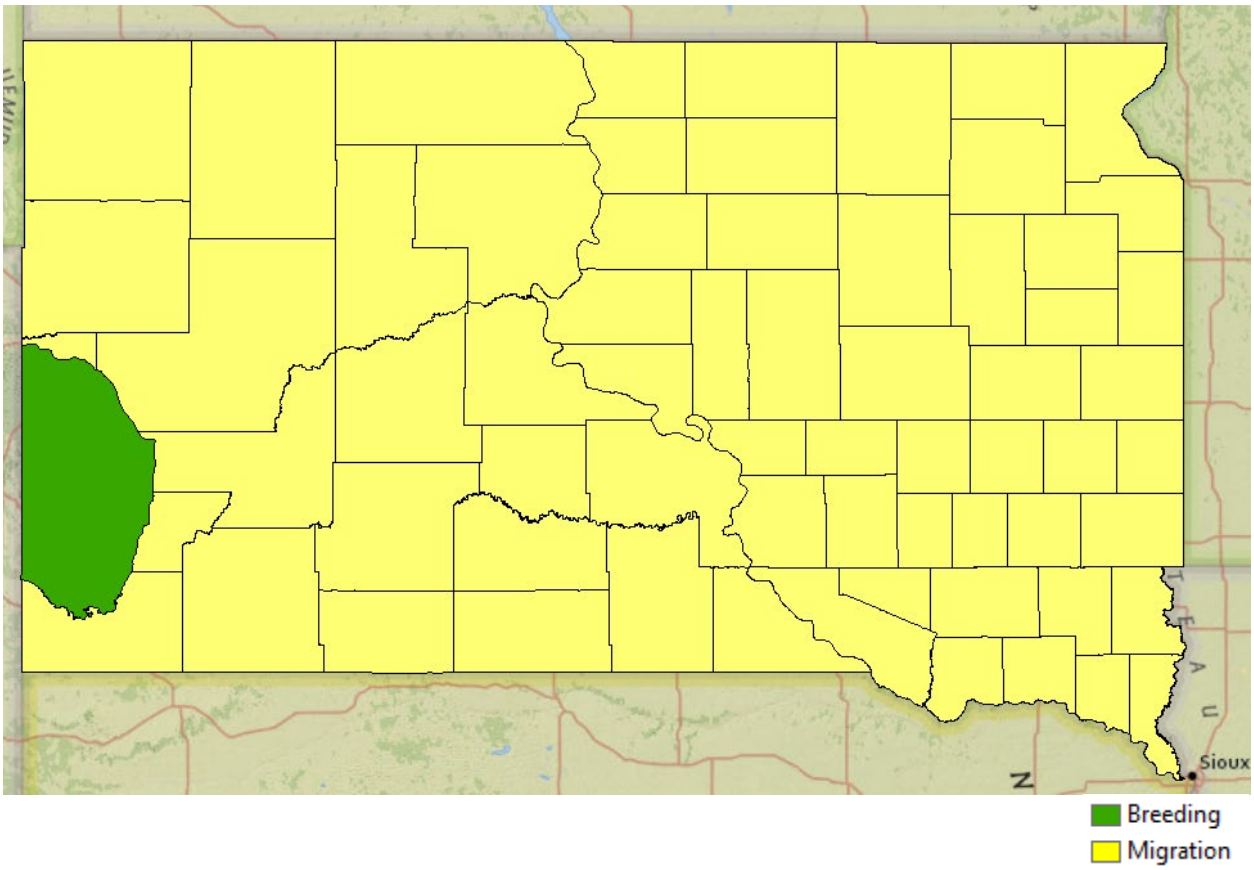


Figure 1. Current distribution of Peregrine Falcon (*Falco peregrinus*) in South Dakota.

Conservation / Management Considerations:

Peregrine Falcon populations rapidly declined between 1940 and 1970 (Hickey 1969) causing the species to be listed as federal endangered. Population declines were primarily attributed to the widespread use of the pesticide DDT, which accumulated in small birds eaten by peregrines and caused eggshell thinning and breakage. After successful reintroduction efforts the peregrine was federally delisted in 1999 (USFWS 1999, Cade et al. 2003).

After conducting surveys for nesting Peregrines and preliminary evaluations of cliffs for potential nesting suitability, Oakleaf (2017) indicated that approximately 6 to 8 breeding pairs of peregrines could potentially occupy cliffs in the Black Hills within the next few years. This number equates to approximately one pair per 1000 km^2; a density White et al. (2002) noted was typical for peregrines in North America. The Slim Buttes range in the Custer National Forest of Harding County was also evaluated in 2018 and found to have nesting potential for peregrines (Oakleaf 2018). Suitable natural (non-urban) habitat availability is limited in South Dakota to the Black Hills and potentially portions of northwestern South Dakota, and available nests sites are potentially further limited by conflicting recreational uses.

Successful management should include the protection of nest sites from disturbance. The Black Hills are a popular tourist destination and many of the cliffs that were identified as

suitable peregrine nesting habitat are also popular spots for rock climbers. Excessive climbing activity in the vicinity of a nest could result in nest failure and the presence of climbers could prevent pairs from establishing new nest sites. Monitoring for contaminants should also be considered if deemed necessary. Programs and materials should also be developed to educate the public on appropriate activities near nesting sites.

Conservation Efforts in South Dakota:

1979 and 1980 – Jon Sharps and Dan O'Brien cross-fostered Peregrine Falcon chicks with Prairie Falcon parents in the Black Hills.

1997 – 5 young Peregrines were reintroduced from the Zip Feed building in Sioux Falls by members of the Lakota Audubon Chapter.

1999 – 4 young Peregrines were reintroduced from the roof of the Hotel Alex Johnson in Rapid City as part of an Eagle Scout project.

2011-2013 – State Wildlife Grant Project T-10-R-1. Fifty-seven Peregrine Falcons were released in Rapid City.
https://gfp.sd.gov/images/WebMaps/Viewer/WAP/Website/SWGSummaries/T-10-R/Osprey-final-report_T-10.pdf

2017 – 2023. State Wildlife Grant Project T-81-R-1. GFP contracted with Bob Oakleaf (Lander, Wyoming) to monitor nest occupancy and productivity of documented nests, survey locations outside the Black Hills to identify suitable cliff nesting sites, and survey identified suitable cliff nesting sites to document breeding pairs. Highlights from this study:

- Oakleaf surveyed 36 priority sites and additional lower priority sites from 2017 – 2023.
- Nine peregrine nest sites were documented during the survey years, including 2 new sites found during 2023, with alternate nesting locations at 3 of the 9 sites.
- Seven sites were occupied by peregrines during 2023; 4 were successful with at least 11 young fledged. The number of nest sites should be considered a minimum number.
- From 2017-2023, at least 1.7 young fledged per occupied site or 2.7 young per successful pair.
- Nesting chronology was developed; mean fledging date was 10 July; average estimated date for incubation initiation was 25 April, and average hatching date was 28 May, although all estimates have associated date ranges.
- Oakleaf's recommendations include future surveys of sites previously considered lower priorities, survey timing recommendations, and continued dialogues with climbers and associated businesses in the Black Hills.
- Survey results justified downlisting this species from state endangered to state threated in 2022 (Oakleaf 2023).

2024 – Oakleaf continued nesting surveys under contract with GFP. As of the time of this update, he had surveyed 14 cliff sites during April 2024. Sites were evaluated during production surveys in July 2024, with a final report from the contractor expected by the end of August 2024.

Recovery Criteria/Goals

Drafting downlisting and delisting goals for this species was done with the understanding that Peregrines nesting in South Dakota are part of a larger population in western North America. Although the following goals may be modest compared to recovery goals for other species, they represent a reasonable expectation of what the suitable and available natural nesting sites can support for a sustained period within the state's boundaries.

For downlisting to threatened, South Dakota's Peregrine Falcon population should consist of an average of two active nests for at least 5 years in a 6-year timespan. For delisting, there should be an average of five active nests for at least 5 years in a 6-year timespan. Active nests may be the result of both naturally occurring pairs or from returning reintroduced individuals that establish breeding territories. In addition, average productivity of the active nests must be 1.25 naturally produced young/pair across the 5-year period.

The following efforts should be considered to achieve recovery criteria:

- Continue to identify active peregrine nests statewide.
    - Conduct surveys in historic and suitable peregrine nesting habitat to document presence/absence.
    - Solicit observations from agency personnel, local birding groups, and landowners to identify nesting sites.
- Continue to monitor nesting success and productivity of active nests.
    - Document number of young hatched and successfully fledged.
    - Identify nest site characteristics and evaluate their influence on nest success.
- Monitor "floaters" or non-breeding individuals' activities to identify potential nest sites.
- Place nest boxes on suitable structures in urban areas where peregrines have been observed to encourage nesting where feasible.
- Reduce or eliminate disturbance of nest sites during the breeding season.

Primary Reviewer:

Casey Heimerl, Wildlife Biologist, SD Game, Fish and Parks, Pierre

Other Staff or Experts Involved in the Review:

- Bob Oakleaf, former Wyoming Game and Fish Department Nongame Coordinator
- Janie (Fink) Veltkamp, Raptor Biologist, Birds of Prey Northwest

Date Updated Review Completed: June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018: approved by GFP Commission on April 5-6, 2018; 2020; and 2022.

References or Information Sources:

Barclay, J.H., and T.J. Cade. 1983. Restoration of the Peregrine Falcon in the eastern United States, Pages 3-40 *in* S. Temple [Ed.], Bird Conservation. Vol 1, Univ. of Wisconsin Press, Madison, WI.

Barnes, J.G., R.D. Haley, D.B. Thompson and J.R. Jaeger. 2015. Attributes of a breeding population of peregrine falcons associated with reservoirs on the Colorado River. Journal of Raptor Research 49(3):269-280.
Cade, T.J. 1960. Ecology of the peregrine and gyrfalcon populations in Alaska. University of California Publications in Zoology 63: 151-290.
Cade, T.J., J.H. Enderson, C.G. Thelander, and C.M. White, eds. 1988. Peregrine falcon populations; their management and recovery. The Peregrine Fund Inc., Boise, ID.
Cade, T.J., and D.M. Bird. 1990. Peregrine falcons, Falco peregrinus in an urban environment: a review. Canadian Journal of Field Naturalists 104:209-218.
Cade, T.J., W.A. Burnham, and P. Burnham. 2003. Return of the Peregrine: A North American saga of tenacity and teamwork. The Peregrine Fund, Boise, Idaho, USA.
Dowd Stukel, E. 2013. Peregrine falcon (Falco peregrinus) reintroduction in South Dakota. Final Report, T-10-R-1, Amendment #5. GFP, Pierre.
Herkert, James R. 2000. Peregrine falcon reclassification goals. Report for the Illinois Endangered Species Protection Board.
Hickey. J.J. 1969. Peregrine Falcon Populations, Their Biology and Decline. University of Wisconsin Press. Madison, WI, USA.
Oakleaf, Robert J. 2017. Peregrine falcon surveys for the South Dakota Department of Game, Fish and Parks. Unpublished report to GFP, Pierre, SD, USA.
Oakleaf, Robert J. 2018. Peregrine falcon surveys for the South Dakota Department of Game, Fish and Parks. Unpublished report to GFP, Pierre, SD, USA.
Oakleaf, Robert J. 2019. Peregrine falcon surveys for the South Dakota Department of Game, Fish and Parks. Unpublished report to GFP, Pierre, SD, USA.
Oakleaf, Robert J. 2023. Peregrine falcon surveys for South Dakota Department of Game, Fish and Parks, 2023. 8 pages.
Patton, F. 1926. Out trip to the eagle nest. The Oologist 43:30-31.
Pettingill, O.S. and N.R. Whitney. 1965. Birds of the Black Hills. Special Publ. No. 1. Cornell Laboratory of Ornithology, Cornell University. Ithaca, New York, USA.
Sharps, J.C., and D. O'Brien, 1985. Peregrine falcon reintroduction in the Black Hills, South Dakota, 1977-1980. Dept. of Game, Fish and Parks, Wildlife Division, Completion Report No. 85-10.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
U.S. Fish and Wildlife Service [USFWS]. 1999. Endangered and threatened wildlife and plants; final rule to remove the American Peregrine Falcon from the Federal list of endangered and threatened wildlife. Federal Register 64:46542-46558.
U.S. Fish and Wildlife Service [USFWS]. 2003. Monitoring plan for the American peregrine falcon, a species recovered under the Endangered Species Act. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory Birds and State Programs, Pacific Region, Portland, OR. 53 pp.
White, C.M., N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine falcon (Falco peregrinus). In A. Poole (Ed.) The Birds of North America. No. 660. Cornell Lab of Ornithology, Ithaca, NY.
Wightman, C.W., and M.R. Fuller. 2005. Spacing and physical habitat selection patterns of peregrine falcons in central West Greenland. Wilson Bulletin 117(3):226-236.

SUMMARY OF UPDATES IN 2024:

- Included highlights from completed State Wildlife Grant project T-77 for 2017 – 2023.
- Included preliminary survey results for 2024 from contractor Bob Oakleaf.

STATE T&E SPECIES STATUS REVIEW

Species Name: Piping Plover (*Charadrius melodus*)

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:02. List of threatened birds)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3 (vulnerable; state rank last reviewed 2019)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- Protected under Migratory Bird Treaty Act (protection for covered birds, body parts, nests, and eggs)
- Federal threatened species. South Dakota is part of the Northern Great Plains population. The Great Lakes Piping Plover population is federal endangered. The Atlantic Coast population is federal threatened. Federal recovery plan covering both populations was finalized in 1988 (USFWS 1988). Since then, separate revised recovery plans have been finalized or are in the process of revision and finalization.
- NatureServe global rank G3 (Vulnerable); last reviewed 7 April 2016

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The specific justification for including the Piping Plover on the first list of state threatened birds is unknown but was presumably intended to mirror its federal status as a threatened species. Continued listing as a state threatened species is recommended at this time based on limited habitat available in the state and numerous threats to successful fledging.

Description, biology and life history:

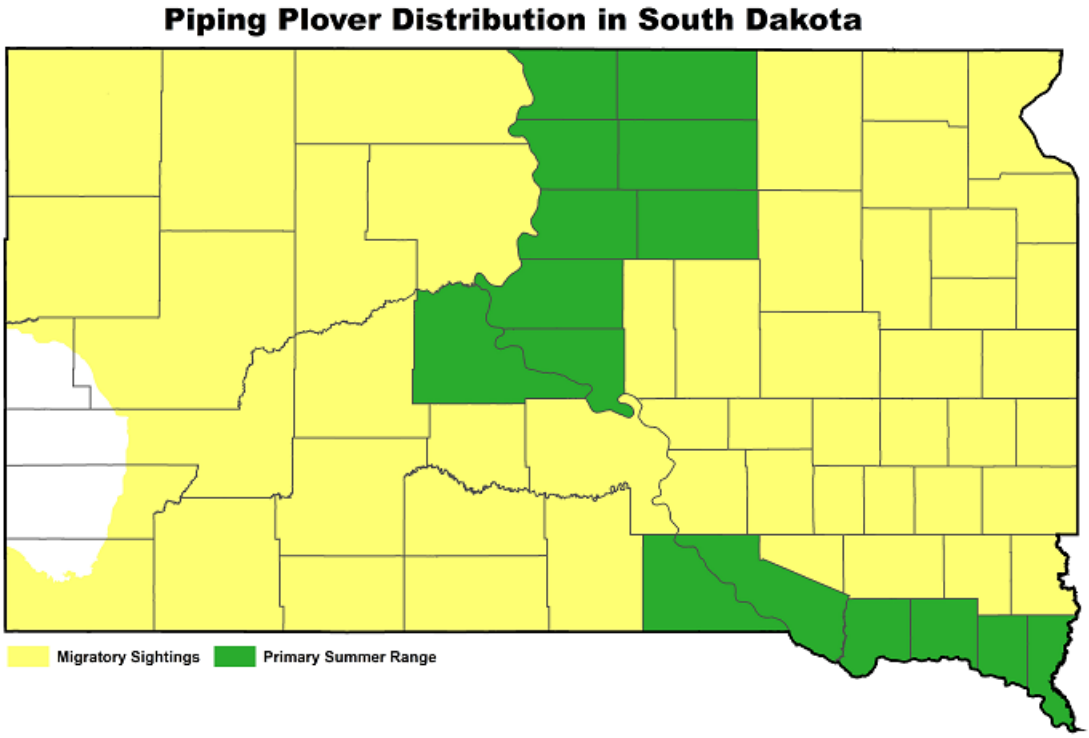
The Piping Plover is a sandy-gray colored, robin-sized shorebird with one dark breast band and a dark stripe across the crown during the breeding season. The white rump is visible during flight. This species is present in South Dakota during the breeding season. It arrives in April and nests through July or August. Nests are shallow, scraped depressions, sometimes lined with small pebbles or shells. The female lays a clutch typically of 4 eggs in late May or early June. Eggs hatch 27-31 days later. In South Dakota, this species often nests in association with the Least Tern.

Habitat:

Nesting areas are sandbars and sand and gravel beaches with short, sparse vegetation. Piping Plovers feed along the water's edge on small insects, crustaceans, and mollusks. They will use both natural and human-made habitats.

Distribution within the state:

Nesting areas are primarily along Lake Oahe and the lower Missouri River below Fort Randall and Gavins Point dams. Additional nesting occurs on alkaline wetlands of northcentral and northeastern South Dakota, when habitat conditions are suitable, and very rarely along lakeshores in western South Dakota.



Conservation / Management Considerations:

Potential nesting habitat for this species in the Northern Great Plains was drastically reduced with the construction of 6 major dams on the Missouri River, 4 of which were built in South Dakota. Threats to nesting colonies include mammalian and avian predators, unrestricted pets, recreationists who disturb incubating adults or destroy nests or chicks, hail or other severe weather, elevated water levels during the nesting season, habitat erosion, and vegetative encroachment/plant succession.

Conservation Efforts in South Dakota:

Past:

More than 90,000 acres of land were transferred from the U.S. Army Corps of Engineers (USACE) to the State of South Dakota as a result of the Water Resources Development Act of 1999. Land transferred to the State of South Dakota is managed by Wildlife and/or Parks and Recreation divisions of South Dakota Game, Fish and Parks (GFP). Two products resulted from GFP's expanded role in endangered species management along the Missouri River, an interagency Memorandum of Agreement (MOA) regarding endangered species protection and recovery along the river and a state management plan for the Interior Least Tern and Piping Plover (state management plan) (Aron 2005).

The first 5-year Missouri River endangered species interagency MOA was finalized in 2001 and included specific and shared commitments of 3 agencies; GFP, USACE, and the U.S. Fish and Wildlife Service (USFWS) (Dowd Stukel 2003). Subsequent MOAs included the National Park Service in addition to the original 3 agencies. MOA accomplishments by all participants included such activities as biological surveys and nesting season productivity for Least Terns and Piping Plovers within the portion of the Missouri River surveyed by the USACE and GFP, specific protocols or policies developed to help implement the MOA, outreach and educational efforts related to Missouri River endangered species, law enforcement efforts, and relevant Section 7 consultations among federal agencies.

As GFP assumed responsibility for additional ownership and management of lands along the Missouri River, concern increased about the possibility of needing permission for incidental take. State management plans were prepared for the 4 species covered by the MOA as part of an agency intention to submit a habitat conservation plan (HCP) to allow incidental take of federal listed species. Management plans were prepared for the Pallid Sturgeon and Bald Eagle. Piping Plover and Least Tern were covered in one plan. The HCP was not formally pursued.

The International Piping Plover Census was designed to be conducted every 5 years on both wintering and breeding grounds. Begun in 1991, the census was most recently conducted in 2016. The effort relies on federal, tribal, and state wildlife personnel and volunteers and at the state level is typically overseen by staff with the U.S. Geological Survey or USFWS. South Dakota's participation has varied depending on other commitments and whether water level conditions are conducive to the census. As of 2024, it's unclear if or when this census will be repeated.

<u>Ongoing:</u>
The GFP Commission passed the following administrative rule in 1989 to provide added protection for Least Tern and Piping Plover nesting colonies in the state:

> Administrative Rule 41:10:02:18. Harassment prohibited. Harassment of the nesting and rearing sites of the least tern, an endangered species, and the piping plover, a threatened species, is prohibited. The department shall post conspicuous signs near critical nesting and rearing sites on the sandbars and shoreline of the Missouri River to warn against entry during the nesting period.

The MOA has progressed through several iterations, with the most recent version finalized in 2015. Following coordination among the USACE, GFP, and USFWS, the 2015 MOA expired without renewal because of the successful partnership established among the agencies. GFP committed to continued support to the USACE with upper Lake Oahe nesting surveys by annually hiring an experienced contractor for that area of the state.

Nesting survey data are collected by state, federal, and tribal personnel. The most extensive nesting data are collected by the USACE. These data are collected in a systematic manner, with strict quality control measures, prior to incorporation into the USACE's endangered species data management system. This system is used to document USACE compliance with a Biological Opinion between the USACE and USFWS regarding Missouri River endangered

species and to assist the USACE in avoiding negative impacts to nesting colonies while making short- and long-term water management decisions. The USACE allows GFP to access the data management system to assist the South Dakota Heritage Database Manager and other GFP staff in conducting environmental review.

Highlights from the USACE's report for Least Tern and Piping Plover Missouri River nesting surveys during 2023 are as follows:

- Adult census for Piping Plovers, conducted from June 19 – 30, 2023, resulted in total adult count of 2,055 birds, a 2% increase from 2022 and the highest Missouri River adult Piping Plover count since monitoring began in 1993.
- Piping Plover population growth rate was above the 1.0 target.
- Productivity (3-year arithmetic mean fledge ratio) was slightly below the 1.14 fledgling per adult pair target in 2023.
- The highest cause of known mortality of Piping Plovers during 2023 along the monitored portion of the Missouri River was weather (21).
- Habitat restoration included herbicide application to 2,638 acres and prescribed burning of 80 acres to maintain or increase emergent sandbar habitat (Hofer 2023).

The USFWS designated portions of South Dakota as critical nesting habitat for the Piping Plover in 2002 (Federal Register 2002). Included areas were Lake Oahe and the Missouri River from Fort Randall Dam south to Ponca State Park, Nebraska, including Lewis and Clark Lake. Critical habitat contains important elements or habitat features that meet a species' life cycle needs. Critical habitat is relevant when there is a federal nexus, such as federal funding provided or federal approval needed for a project within designated critical habitat.

GFP Senior Wildlife Diversity Biologist participated on the Northern Great Plains Piping Plover Recovery Team (Team) from 2010 - 2016. The Team's primary task was to assist in the revision of the Northern Great Plains Piping Plover Recovery Plan. The draft recovery plan (Draft Plan) was published in the Federal Register in 2016 (U.S. Fish and Wildlife Service 2016). In January 2018, the USFWS informed Team members of the USFWS's intent to revise the Draft Plan and prepare a species report and recovery implementation strategy, to be available for public comment during the spring of 2018. Since that time, the USFWS has shifted its recovery planning direction.

In 2023, the USFWS publicized a Peer Review Plan for the Biological Repot for the Northern Great Plains population of piping plover (https://www.fws.gov/media/peer-review-plan-northern-great-plains-ngp-population-piping-plover-charadrius-melodus) The biological report was completed during 2023. This process identified the need for a more rigorous and standardized monitoring program (USFWS 2024a). The USFWS subsequently solicited assistance from partner agencies in implementing the monitoring program.

In January 2024, the USFWS announced the initiation of 5-year status reviews of 10 listed animal and plant species, including the Northern Great Plains population of the Piping Plover (USFWS 2024b). Status reviews use the best scientific and commercial data available to assist the USFWS in ensuring that continued listing as threatened or endangered is accurate.

Future:
GFP will continue providing nesting survey support on upper Lake Oahe by annually hiring an experienced contractor to work with the USACE survey crew. GFP will continue using nesting season data provided by the USACE and other sources for environmental review.

State Recovery Criteria/Goals:
South Dakota will cooperate with the USFWS in meeting recovery goals described in the revised federal recovery plan. The revised federal plan will reflect the most current scientific and management information. Separate state recovery goals are not recommended.

Primary Reviewer:
Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

Other Staff or Experts Involved in the Review:
Paul Mammenga, Wildlife Biologist, GFP, Aberdeen

Date Current Review Finalized: June 2024

Dates of Other Reviews, if appropriate: 2018, 2020 and 2022

References or Information Sources:

Aron, C. 2005. South Dakota Interior Least Tern (*Sterna antillarum athalassos*) and Piping Plover (*Charadrius melodus*) Management Plan. South Dakota Department of Game, Fish and Parks, Pierre, Wildlife Division Report No. 2005-02, 76 pp.

Dowd Stukel, E., ed. 2003. Annual accountability report for 2003 activities in support of Missouri River Interagency Endangered Species Memorandum of Agreement. SD Dept. of Game, Fish and Parks, Wildlife Division Report No. 2004-03, Pierre.

Federal Register. 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover; Final Rule. 50 CFR, Part 17, Vol. 67, No. 176, pages 57638 – 57717.

Hofer, C. 2023. USACE Missouri River tern and plover monitoring, Section 10 Sampling Permit Reporting – 2023. U.S Army Corps of Engineers, Omaha District. 13 pages.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

U.S. Fish and Wildlife Service (USFWS). 1988. Great Lakes and Northern Great Plains Piping Plover Recovery Plan. U.S. Fish and Wildlife Service, Twin Cities, MN. 160 pp.

U.S. Fish and Wildlife Service (USFWS). 2016. Endangered and Threatened Wildlife and Plants: Draft Revised Recovery Plan for the Piping Plover. Federal Register Vol. 81, No. 51, pages 14121-14122.

U.S. Fish and Wildlife Service USFWS). 2024a. Draft monitoring methodology and protocol of the Northern Great Plains Piping Plover. USFWS, Missouri River Recovery Office. 14 pages.

U.S. Fish and Wildlife Service (USFWS). 2024b. Endangered and Threatened Wildlife and Plants: Initiation of 5-Year Status Reviews of 16 Listed Animal and Plant Species. Federal Register 89:804-806.

SUMMARY OF UPDATES IN 2024:

- Highlights from the USACE Piping Plover 2023 monitoring along the Missouri River are presented.
- The USFWS produced a Biological Report for this population in 2023.
- The USFWS prepared and circulated new monitoring methodology and protocols for monitoring this species.
- The USFWS announced plans in January 2024 to conduct a 5-year review for this population.

STATE T&E SPECIES STATUS REVIEW

Species name: Whooping Crane, (*Grus americana*)

South Dakota Status, including legal status and special listings:

- State endangered (SD Administrative Rule 41:10:02:01, List of endangered birds)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank S1 (critically imperiled)
- Included as a Species of Greatest Conservation Need in the South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- Nature Serve global rank G1 (species critically imperiled); last reviewed 8 April 2016
- Protected under the Migratory Bird Treaty Act
- Federal endangered. This species was listed as endangered in 1967 pursuant to precursor legislation to the Endangered Species Act (ESA) of 1973. International recovery plan, third revision published in 2007 (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007)

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The specific justification for including the whooping crane on the first list of state endangered birds is unknown but was presumably intended to mirror its federal status. In the event that this species is delisted by the U.S. Fish and Wildlife Service (USFWS), we will reevaluate whether continued listing as a state endangered species is warranted.

Description, biology and life history:

At 4-5' tall, the whooping crane is the tallest wading bird in North America. The adult is white with long black legs, wingtips and markings below the eye. The top and sides of the head are featherless with bright red skin. Juveniles are a cinnamon color. The common name likely originates from the single note vocalization that is repeatedly given when alarmed. Average age in the wild is estimated to be 30 years.

Successful nesting and egg production begin at five years of age. Whooping cranes are monogamous and will rapidly replace a lost mate. Pairs exhibit strong site fidelity to nesting areas. Two eggs are laid in late April to mid-May and hatch about one month later. Typically only one young successfully reaches the wintering grounds.

Migration north begins in late March to early-April and is completed in two to four weeks. Fall migration begins in mid-September with most birds arriving on the wintering grounds in late November. These birds are observed in South Dakota beginning in early to mid-April during the spring and again in October during the fall migration. Whooping cranes migrate during the day and can be seen as individuals, in small groups or more rarely in flocks of up to 20 birds. Whoopers can also be seen migrating with sandhill cranes.

Habitat:

The only self-sustaining, wild migratory population in the world breeds in portions of the Northwest Territories in Canada and adjacent areas of Alberta, especially within Wood Buffalo National Park. During breeding, this species prefers poorly drained headwater areas with abundant wetlands interspersed with spruce and tamarack. Bulrush dominates the diatom ponds that are used for nesting. Whooping cranes migrate twice a year through the Great Plains of North America. During migration, whooping cranes will use a variety of wetlands including marshes, wet prairies, and shallow water in rivers, reservoirs or lakes as well as grain and stubble fields. The winter range is along a 30-mile stretch of the Gulf of Mexico coastline in Texas including the Aransas National Wildlife Refuge. Estuarine marshes, shallow bays and tidal flats are used on the wintering grounds.

Whooping cranes are omnivorous consuming a variety of items including insects, berries, grains, plant tubers, crustaceans, fish, reptiles and amphibians. Animal foods including blue crabs and clams are the primary foods during the winter. Agricultural grains are often consumed during migration.

Distribution within the state:

Although individuals of this population can be found during migration anywhere in South Dakota, they are most commonly found along and adjacent to the Missouri River.

Conservation / Management Considerations:

Overharvest was one of the main reasons for the historical decline of this species. Population declines were suspected by the early 1900s. Conversion of grassland and wetland for hay and grain production destroyed and altered traditional breeding grounds in the central United States. Similarly, migratory stopover habitat has been lost or degraded due to wetland drainage and river water diversion. Wintering grounds are impacted by reduced freshwater inflows into coastal estuaries making the water too saline for whooping cranes. This increased salinity reduces availability of blue crabs, the primary food source during the winter.

Loss and alteration of grassland and wetland habitats continue to impact this species as well as mortality from power lines, disease and loss of genetic diversity. Sixty to 80% of mortalities occur during migration. Strikes with power lines constitute a substantial portion of that mortality and is the primary cause of death, especially for young birds. Wind turbines and guy wires associated with communication towers also pose a collision risk for whooping cranes. Mortality is also caused by accidental shootings resulting from misidentification of harvested bird species as well as intentional shootings. Whooping cranes are also susceptible to disturbance from humans, especially those on foot. Boat, plane and vehicle traffic are also potential sources of human disturbance. Research and monitoring needs in South Dakota include updating the National Wetlands Inventory, monitoring the impacts of tile drainage, continued migration monitoring and further understanding of stopover habitat.

The 2022-2023 annual population survey conducted on the wintering grounds in January 2023 resulted in an estimated abundance of 536 birds, compared to 543 birds the previous year (McAbee and Conkin 2024).

The USFWS conducts Species Status Assessments (SSA) to determine the current and future status of listed species and assess their future viability. Additional planning and recovery tools include recovery plans and 5-year reviews. The 2007 recovery plan is currently being revised in conjunction with preparation of an SSA for this species. Following the completion of those documents, including public and agency input opportunities, attention will shift to the completion of a 5-year review (Kevin McAbee, pers. comm.).

Conservation Efforts in South Dakota:

Seasonal press releases are distributed to inform the public that migrating whooping cranes are protected, that whooping cranes can be confused with other large white birds with black wing-tips and that reports of whooping crane sightings are important and encouraged. Confirmed reports of migrating whooping cranes from the public and wildlife professionals are entered into the South Dakota Natural Heritage database and provided to the USFWS through a Survey 123 wildlife survey application distributed by the Grand Island, Nebraska Field Office of the Ecological Services Division.

GFP provided review and oversight of the Great Plains Wind Energy Habitat Conservation Plan (HCP). This draft HCP was developed by the Wind Energy Whooping Crane Action Group to address potential impacts from development and operation of wind energy facilities on federal listed species potentially impacted by wind energy development in the Great Plains. It was also intended to streamline the ESA permitting process. The current status of this planning effort is unknown.

Recovery Criteria/Goals

GFP will cooperate with the USFWS in meeting downlisting goals detailed in the recovery plan (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

Primary Reviewer: Silka Kempema, wildlife biologist; reviewed and updated by Eileen Dowd Stukel, June 2024

Date Current Review Finalized: June 2024

Dates of Other Reviews, if appropriate:
2018; approved by GFP Commission in April.
2020; approved by GFP Commission in September
2022; approved by GFP Commission in September

References or Information Sources:

Ashton, D. E., and E. M. Dowd. 2008. Fragile legacy: Rare animals of South Dakota. Wildlife Division Report Number 91-04.

Canadian Wildlife Service and U.S. Fish and Wildlife Service. 2007. International recovery plan for the whooping crane (*Grus americana*). Ottawa: Recovery of Nationally Endangered Wildlife (RENEW) and U.S. Fish and Wildlife Service. Albuquerque, New Mexico. 162 pages.

McAbee, K. and J. Conkin. 2024. Whooping crane recovery activities – 2022 breeding season to 2023 spring migration. U.S. Fish and Wildlife Service and Canadian Wildlife Service. 50 pages.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
U.S. Fish and Wildlife Service. 2012. Whooping crane (*Grus americana*) 5-year review: Summary and evaluation. U. S. Department of the Interior.
U.S. Fish and Wildlife Service. 2021. Endangered and threatened wildlife and plants; Initiation of 5-year status reviews of 23 species in the Southwest. Federal Register 86:23976-23978.

SUMMARY OF UPDATES IN 2024:

- Updated with progress on various planning and administrative efforts led by USFWS.

STATE T&E SPECIES STATUS REVIEW

Species Name: Banded Killifish, *Fundulus diaphanus*

South Dakota Status, including legal status and special listings:

- State endangered, (SD Administrative Rule 41:10:02:05. List of endangered fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S1, (critically imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 18 August 2015 (NatureServe 2024)

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Banded Killifish are widespread and secure throughout the eastern portion of its range. Banded Killifish are at the western edge of their range and listed as critically imperiled in South Dakota. The justification for including Banded Killifish on the first list of state endangered (16 March 1978) fish is unknown but was presumably due to wetland drainage, possible climatic conditions, and fragmentation from interconnecting waterways of suitable habitat. Based on the presumed limited area of occupancy, threat of wetland drainage and limited potential for range expansions; Banded Killifish are extremely vulnerable to extirpation with limited ability for recolonization and continued listing as a state endangered species is recommended.

Description, biology and life history:

The Banded Killifish is a small, olive colored fish with yellow sides having green-brown vertical bands. It has a flattened head, protruding lower jaw and rounded caudal fin which make this fish well-adapted for surface feeding. Similar species include Central Mudminnow, which has a dark black vertical band at the caudal fin base and dark spot below the eye. Also the Plains Killifish is similar in appearance with vertical bands along the lateral sides, however they have smaller scales with roughly 50-67 scales in the alter series. Banded Killifish spawn in late spring and summer when water temperatures reach 21°C to 23°C. Eggs are released and immediately fertilized in clusters of 5-10 eggs, which adhere to vegetation. Spawning continues until 50 or more eggs are released. Eggs hatch within 10 to 12 days. The diet consists of small crustaceans, insect larvae and some plant material (SDGFP 2006; Phillips et al. 2007).

Habitat:

Habitat for the Banded Killifish may be lentic or lotic. Banded Killifish prefer quiet and shallow waters of sloughs, marshes, ponds and lakes, as well as low gradient streams with gravel or sand substrate and abundant vegetation (SDGFP 2006).

Distribution within the state:

Banded Killifish have been reported from a few lakes (Lake Andes, Garden Creek HUC_1014010117; Lake Eureka, Long Lake HUC_1013010603; Lake Cochrane, Lazarus Creek HUC_702000302; Blue Dog Lake, Waubay Lakes HUC_1017020102; Waubay Lake, Waubay Lakes HUC_1017020102; Bitter Lake, Bitter Lakes HUC_1017020103) in eastern South Dakota which is on the western periphery of its range (Bailey and Allum 1962; Bauer 1988; Lott 1991; Schlafke et al. 2024). Since 2000, reported Banded Killifish have been limited to the inlet of Bitter Lake, Day County and Little Eureka Lake, McPherson County.

Conservation / Management Considerations:

Banded Killifish have been impacted by ecosystem/habitat conversion and loss, ecosystem alteration and habitat degradation due to shoreline development, conversion of wetlands to agriculture, pollution, and application of pesticides and herbicides (SDGFP 2006; 2014a).

Research and monitoring needs will focus on determining the current status of populations by increasing monitoring efforts, assessing population dynamics, and identifying conservation opportunity areas and limiting factors.

Conservation Efforts in South Dakota:

Conservation efforts will focus on increased survey efforts, expanding partnerships and cooperative arrangements, increasing awareness through education, and promoting best

management practices that reduce/limit soil erosion and nutrient/pesticide runoff. Additionally, objectives and strategies will follow those outlined within the East River Fisheries Management Plan to standardize survey and sampling protocols to inventory and monitor stream and riverine fishes (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.

Recovery Criteria/Goals:

Given that Banded Killifish have limited natural dispersal abilities the primary recovery goal is to maintain existing populations and protect the habitat within watersheds where Banded Killifish are found. Specific goals for managing Banded Killifish are to work with fisheries biologists to standardize shoreline seining efforts in coordination with lake surveys and work with private land and habitat biologists to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current population status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist GFP

Other Staff or Experts Involved in the Review:

Dave Lucchesi, Fisheries Biologist, GFP, Sioux Falls
Brian Blackwell, Fisheries Biologist, GFP, Watertown
Katie Bertrand, Assistant Professor, SDSU, Brookings
Matthew Wagner, State Ichthyologist, Mississippi Department of Wildlife, Fisheries and Parks, Jackson, MS
Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

Date Review Completed: June 24, 2024
Date Adopted by GFP Commission: April 6, 2018
Dates of Other Reviews, if appropriate: December 14, 2017, May 28, 2020, June 10, 2022

References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Bauer, D. L. 1988. The effect of grass carp introduction on aquatic vegetation and existing fish populations in two small prairie lakes. M.S. Thesis. South Dakota State University, Brookings, South Dakota.

Lott, J. P. 1991. Food habits of yellow perch in eastern South Dakota glacial lakes. M.S. Thesis. South Dakota State University, Brookings, South Dakota. 2641.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: May 6, 2024).
Phillips, E. C., Y. Ewert, and P. A. Speares. 2007. Fecundity, age and growth, and diet of *Fundulus diaphanous* (Banded Killifish) in Presque Isle bay, Lake Erie. Northeastern naturalist, 14(2):269-278.
Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.
South Dakota Department of Game, Fish and Parks. 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks. 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: East River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

SUMMARY OF UPDATES IN 2020:

In coordination with the Northeast Fisheries Management Area Strategic Plan and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. In 2019, the first year of sampling was completed in the northeast, sampling Waubay Lake in coordination with standard lake surveys. Although no rare nongame species were reported, including Banded Killifish, standardized nongame sampling in coordination with standard lake surveys will continue. Currently, workplans have identified one standing water and one tributary per year to sample for nongame species through the 2023 sampling season.

SUMMARY OF UPDATES IN 2022:
Aquatic strategic planning efforts continue.

SUMMARY OF UPDATES IN 2024:
Aquatic strategic planning efforts continue. Since 2019, lake surveys in waters with rare species have incorporated standardized nongame sampling procedures. To date, Waubay, Blue Dog, Lake and Cochrane have been surveyed, however no Banded Killifish have been sampled. Bitter Lake, Waubay Lake and Little Eureka are scheduled to be surveyed over the next four years.

STATE T&E SPECIES STATUS REVIEW

Species Name: Blacknose Shiner, *Notropis heterolepis*

South Dakota Status, including legal status and special listings:

- State endangered, (SD Administrative Rule 41:10:02:05. List of endangered fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S1 (critically imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 18 August 2015 (NatureServe 2024).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Blacknose Shiner are widespread and apparently secure throughout the northern portion of their range; however, the species is currently listed as critically imperiled in South Dakota. Blacknose Shiner populations have declined or are presumed extirpated throughout the majority of their Midwestern distribution (Bernstein et al. 2000; Roberts and Burr 2006; Hoagstrom et al. 2007; Felts 2013), and remaining populations in South Dakota are now on the periphery of the Blacknose Shiner's distribution. The justification for adding Blacknose Shiner to the list of state endangered fish on 22 May 1996 is unknown but was presumably due to the presence of only small, isolated relict populations, threat of wetland loss, and increased turbidity and siltation resulting from erosion. Due to this species' limited ability for recolonization it is vulnerable to extirpation and continued listing as a state endangered species is recommended.

Description, biology and life history:

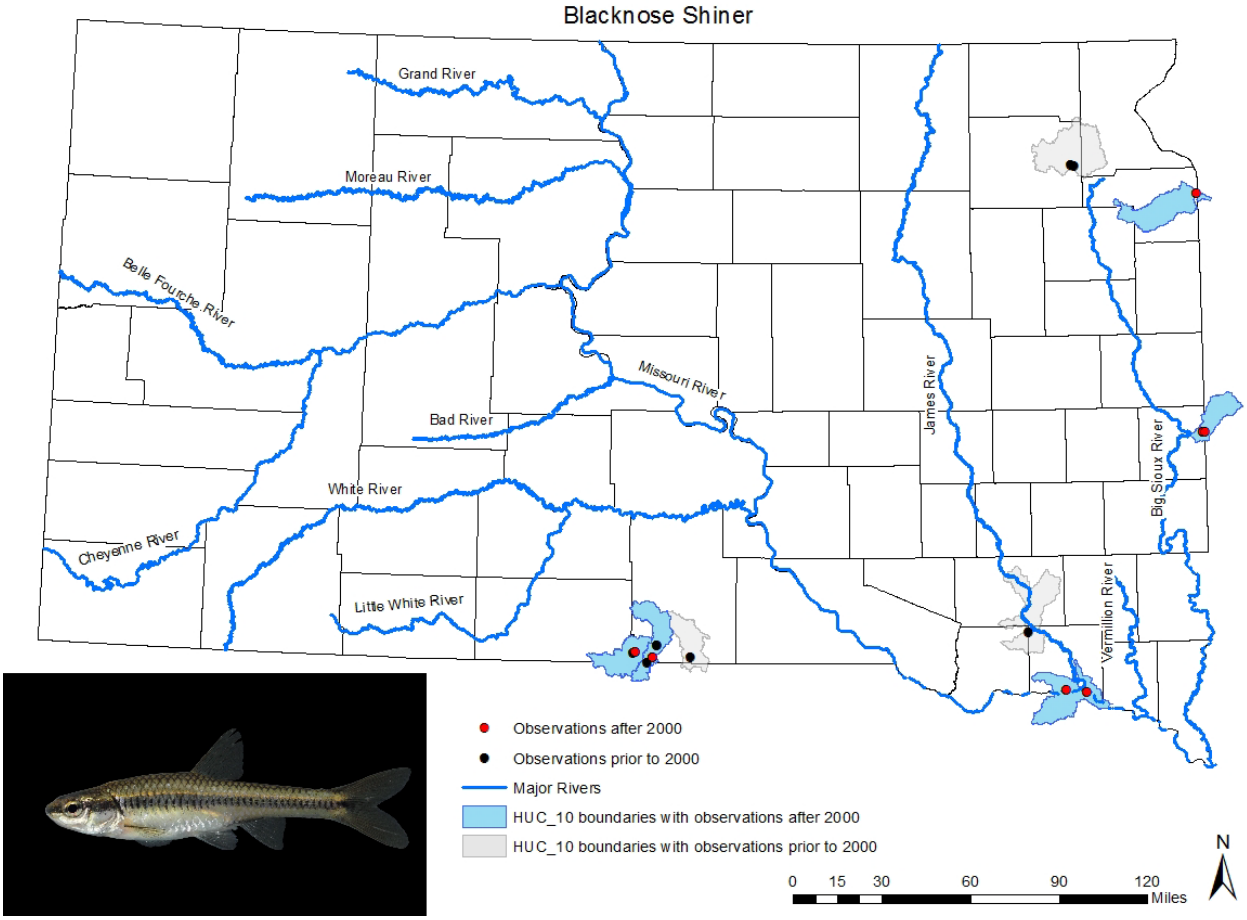
The Blacknose Shiner is a slender, silvery minnow with large eyes. Black crescent-shaped marks form a dark stripe along the lateral line from the tip of the nose to the caudal fin, passing through the eyes (Schlafke et al. 2024). Little is known about the reproductive biology of life history for Blacknose Shiner; a study in Illinois found then to spawn late April through late June, with females remaining in reproductive condition for roughly 2-4 weeks. This extended spawning period indicates that females are multiple clutch spawners (Pflieger 1975; Roberts et al. 2006; NGPC 2010). The diet includes aquatic insects, crustaceans, and algae (SDGFP 2006). A subterminal mouth suggests the species is primarily a benthic feeder (Becker 1983).

Habitat:

Blacknose Shiner prefer cool, clear glacial lakes and small quiet, prairie streams with pool and run sequences. Often associated with considerable amounts of aquatic vegetation and organic debris, sand, gravel or rock substrates (Pflieger 1997; Roberts et al. 2006; SDGFP 2006).

Distribution within the state:

Blacknose Shiner have been reported from tributaries of the James (Wolf Creek-HUC_1016001118), Big Sioux (Waubay Lakes HUC_1017020102, Flandreau Creek HUC_1017020303), Minnesota (North Fork Yellow Bank River HUC_0702000109), Missouri (Beaver Creek HUC_1017010112) and Keya Paha (Sand Creek HUC_1015000603, Shadley Creek HUC_1015000605, Jimmie Creek HUC_1015000608) river drainages which are on the western periphery of the species geographic range (Bailey and Allum 1962; Cunningham and Olson 1994; Cunningham et al. 1995). Since 2000, only single fish occurrences of Blacknose Shiner have been reported from a limited number of tributaries of the Big Sioux, Minnesota, Missouri and Keya Paha River drainages (Hoagstrom et al. 2007; Felts 2013).



Conservation / Management Considerations:

Blacknose Shiner have experienced ecosystem alteration/habitat degradation, partially due to increased turbidity and siltation of stream bottoms, reductions in aquatic and riparian vegetation, and grazing/agricultural practices. It is suggested that Blacknose Shiner are moderately vulnerable to climate change (SDGFP 2014a).

Monitoring and research needs will focus on determining current distribution and status through continued monitoring efforts, assessing population dynamics, and identifying conservation opportunity areas and limiting factors.

Conservation Efforts in South Dakota:

Conservation efforts will focus on more intensive surveying, expanding partnerships and cooperative arrangements, increasing awareness through education, and promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the East and West River Fisheries Management Plans to standardize survey and sampling protocols to monitor non-game fishes (SDGFP 2014b, 2014c).

State Wildlife Grant Accomplishments:

- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8 (2013). The Sandhills area of South Dakota is a unique ecosystem that is home to many rare species, relict of Pleistocene Glaciation. This research assessed the current distribution, status and habitat requirements for these glacial relict fishes.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.
- Evaluation of the James River Conservation Reserve Enhancement Program (CREP) of South Dakota– T-59 (2017). The CREP seeks to enhance natural resource conservation programs in selected watersheds nationwide to address specific regional conservation priorities by attempting to alleviate agriculturally related environmental concerns. This project assessed the effects of CREP on water quality, aquatic habitats, fish assemblages, and avifauna response to the James River CREP.

Recovery Criteria/Goals

Given that Blacknose Shiner have limited natural dispersal abilities, the primary recovery goal for the Blacknose Shiner is to maintain existing populations and protect habitat within watersheds where Blacknose Shiner are found. Specific management goals are to work with fisheries biologists to standardize seining efforts in coordination with increased river/stream surveys and work with private land and habitat biologist to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

Dave Lucchesi, Fisheries Biologist, GFP, Sioux Falls
Brian Blackwell, Fisheries Biologist, GFP, Watertown
George Cunningham, Fisheries Biologist and Environmental Consultant, Eco~centrics, Omaha, NE
Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

Date Review Completed: June 24, 2024
Date Adopted by GFP Commission: April 6, 2018
Dates of Other Reviews, if appropriate: December 14, 2017, May 28, 2020, June 10, 2022

References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Becker, G.C. 1983. Fishes of Wisconsin. University of Wisconsin Press, Madison.

Bernstein, N. P., M. Getting, T. Kamp, S. Christian, R. Smith, J. Steele, and S. Steele. 2000. The status of Blacknose Shiner (*Notropis heterolepis*) in Iowa: a preliminary survey. J. Iowa Acad. Sci., 107:16-20.

Cunningham, G. and R. Olson. 1994. Fish species collected in streams in West River South Dakota-1994. Unpublished report to South Dakota Game, Fish and Parks. Pierre, South Dakota. 10 pp.

Cunningham, G. R., R. D. Olson, and S. M. Hickey. 1995. Fish surveys of the streams and rivers of South Central South Dakota west of the Missouri River. Proc. S.D. Acad. Sci. 74:55-64.

Felts, E. 2013. Ecology of glacial relict fishes in South Dakota's Sandhills region. Master's thesis. South Dakota State University, Brookings.

Hoagstrom, C. W., S. S. Wall, J. G. Kral, B. G. Blackwell, and C. R. Berry. 2007. Zoogeographic patterns and faunal change of South Dakota fishes. Western North American Naturalist 67:161-184.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 24, 2024).

Nebraska Game and Parks Commission (NGPC). 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln.

Pflieger, W. L. 1997. The fishes of Missouri. Revised edition. Mo. Department. Of Conservation. Jefferson City.

Roberts, M. E. and B. M. Burr. 2006. Current conservation status of the blacknose shiner, *Notropis heterolepis*, in Illinois. Trans. Ill. St. Acad. Sci., 99:75-86.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

South Dakota Department of Game, Fish and Parks. 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: East River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014c. Fisheries and aquatic resources adaptive management system 2014-2018: West River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

SUMMARY OF UPDATES IN 2020:

In coordination with the Northeast and Southeast Fisheries Management Area Strategic Plans and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for both fish management areas have identified one standing water and one tributary per year to sample for nongame species through the 2023 sampling season which will include historic Blacknose Shiner waterbodies. Additionally, a proposed multi-state State Wildlife Grant project if funded would increase sampling efforts within the Sandhills areas of South Dakota.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. The multi-state State Wildlife Grant project proposed during the last status update was not approved.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. Since 2019, standard surveys in waters with rare species have incorporated standardized nongame sampling procedures. In 2020, the North Fork Yellowbank River was surveyed, however no Blacknose Dace were sampled. Tributaries to the Keya Paha drainage are scheduled to be surveyed over the next four years.

STATE T&E SPECIES STATUS REVIEW

Species Name: Finescale Dace, *Chrosomus neogaeus*

South Dakota Status, including legal status and special listings:

- State endangered, (SD Administrative Rule 41:10:02:05. List of endangered fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S1, (critically imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 10 May2016 (NatureServe 2024)
- USDA Forest Service, Region 2, Black Hills National Forest sensitive species
- USDA Forest Service, Region 2, Buffalo Gap National Grassland sensitive species
- USDA Forest Service, Region 1, Dakota Prairie Grassland, 2011 aquatic sensitive species
- USDA Forest Service, Region 2, Rocky Mountain Region sensitive species

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Finescale Dace are apparently secure throughout their range, however, listed as critically imperiled in South Dakota. Previously listed state threatened (16 March 1978), the Finescale Dace was listed state endangered on 22 May 1996. The justification for including Finescale Dace on the first list of state threatened is unknown. Surveys during the 1990s failed to document Finescale Dace at all historic locations, except Cox Lake, and the species was reclassified as state endangered (Shearer and Erickson 2005). Their extremely limited distribution is presumably due to habitat alteration, introduction of nonnative fishes, and climate change, which have all limited their potential for range expansions. Finescale Dace are extremely vulnerable to extirpation with limited ability for recolonization and continued listing as a state endangered species is recommended.

Description, biology and life history:

The Finescale Dace is a small, dark olive to silvery minnow with a single dark lateral stripe ending with a spot at the base of the caudal fin. In breeding males, the silvery belly is brassy, to bright yellow or red (NGPC 2010). The ventrolateral surface is peppered with melanophores. The angle of the mouth extends almost to the front of the pupil (Schlafke et al. 2024). Finescale Dace spawn during May-June. Eggs are laid in clusters of 20-30 at a time under logs and brush. Spawning can occur over several days with a female laying as many as 3,000 eggs. Eggs hatch within 4 days. Most individuals live 3 to 4 years (SDGFP 2006). The diet includes algae, mollusks and a variety of aquatic insects (Baxter and Stone 1995).

Habitat:

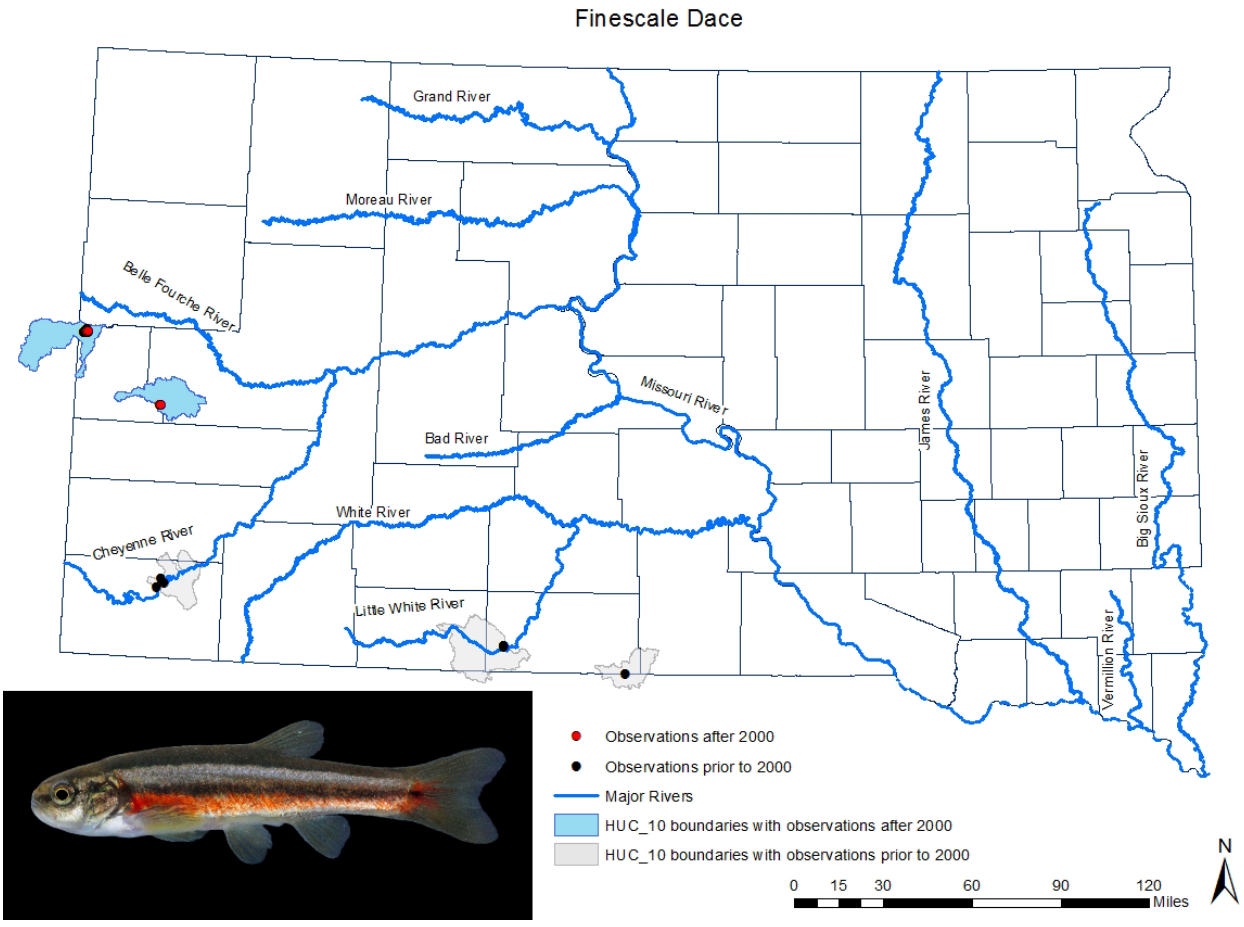
Habitat for Finescale Dace may be lentic or lotic. However, Finescale Dace prefer cool, headwaters streams and ponds with dense aquatic vegetation. Finescale Dace are confined to

cool spring waters and are commonly associated with beaver dams and Northern Redbelly Dace (Stasiak 1977; Baxter and Stone 1995; Isaak et al. 2003).

Distribution within the state:

Within South Dakota, Finescale Dace are found west of the Missouri River and have been reported from tributaries of the Cheyenne (Beaver Creek HUC_1012010903; Dalton Lake-Upper Elk Creek HUC_1012011106), Belle Fourche (Cox Lake, Upper Redwater Creek HUC_1012020303), Little White (Spring Creek HUC_1014020303), and Keya Paha (Sand Creek HUC_1015000603) river drainages, which are on the southern periphery of the geographic range for Finescale Dace (Bailey and Allum 1962; Cunningham and Olson 1994; Olson 1998; Felts 2013). Since 2000, Finescale Dace have been reported in low numbers from Dalton Lake-Elk Creek tributary and a large population from Cox and Mud lakes near Spearfish.

In the fall, 2004, South Dakota Game, Fish and Parks conducted a lake renovation on Mud Lake, near Spearfish to reintroduce Finescale Dace. A rotenone treatment was applied to remove green sunfish and, in the fall of 2005, 50 Finescale Dace were stocked from Cox Lake into Mud Lake (Shearer and Erickson 2005). Mark-recapture population estimates in 2014 indicated 7,022 adult Finescale Dace in Mud Lake, with 95% confidence limits of 5,152 and 9,407 fish (Amiotte et al. 2015).



Conservation / Management Considerations:

Finescale Dace have been impacted by reductions in numbers of beaver dams, ecosystem alteration/habitat degradation, and the introduction of predatory fishes (i.e. green sunfish, trout). Finescale Dace are extremely vulnerable to climate change, due to their need for a specific habitat type (Stasiak and Cunningham 2006; SDGFP 2006, 2014a).

Monitoring and research needs will focus on continuing to expand current monitoring efforts, assessing population dynamics and genetic variation/integrity, identifying conservation opportunity areas and limiting factors, and investigating trap and transfer techniques for potential reintroduction techniques into identified suitable habitats.

Conservation Efforts in South Dakota:

Conservation efforts will focus on expanding partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the Black Hills Fisheries Management Plan to standardize survey and sampling protocols and investigate additional trap and transfer stocking techniques for Finescale Dace into suitable habitats (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8 (2013). The Sandhills area of South Dakota is a unique ecosystem that is home to many rare species, relict of Pleistocene Glaciation. This research assessed the current distribution, status and habitat requirements for these glacial relict fishes.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.
- The occurrence patterns, current distribution, and population interrelatedness of at-risk fishes in the Black Hills ecoregion – T-93 (2023). Describe the current distribution and estimate population densities of at-risk native fishes in the Black Hills ecoregion with an emphasis on Lake Chub and Longnose Sucker.

Recovery Criteria/Goals

Given that Finescale Dace have limited natural dispersal abilities and are restricted to cool spring waters, the primary recovery goals for the management of the population of Finescale Dace is to maintain existing populations and protect the habitat within watersheds where Finescale Dace are currently found. Specific management strategies are to work with fisheries biologists to standardize sampling efforts in coordination with lake surveys in the Black Hills and explore trap and transfer techniques from the Mud/Cox Lake broodstock population for future reintroductions. Additional management strategies will involve

working with private land and habitat biologists to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:
Greg Simpson, Fisheries Biologist, GFP, Rapid City
Jake Davis, Senior Biologist, GFP, Rapid City
Eli Felts, Ph.D. Graduate Research Assistant, SDSU, Brookings
Cassidy Gerdes, M.S. Graduate Research Assistant, SDSU, Brookings
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Dates of Other Reviews, if appropriate: December 14, 2017, June 9, 2020, June 10, 2022

References:

Amiotte, J., G. Simpson, and M. E. Barnes. 2015. Re-establishment of Finescale Dace (*Phoxinus neogaeus*) in Mud Lake, Lawrence County, South Dakota. Proceedings of the South Dakota Academy of Science 94(2015): 195-200.

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Baxter, G. T. and M. D. Stone. 1995. Fishes of Wyoming. Wyoming Game and Fish Department, Cheyenne.

Cunningham, G. and R. Olson. 1995. Fish species collected in streams in West River South Dakota-1994. Unpublished report to South Dakota Game, Fish and Parks. Pierre, South Dakota. 10 pp.

Felts, E. 2013. Ecology of glacial relict fishes in South Dakota's Sandhills region. M.S. Thesis. South Dakota State University, Brookings, South Dakota.

Isaak, D. J., W. A. Hubert, and C. R. Berry, Jr. 2003. Conservation assessment for Lake Chub, Mountain Sucker, and Finescale Dace in the Black Hills National Forest, South Dakota and Wyoming. US Department of Agriculture, Forest Service, Custer, South Dakota.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 24, 2024).

Nebraska Game and Parks Commission (NGPC). 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln.

Olson, R. 1998. Finescale Dace and Lake Chub Survey. South Dakota Wildlife Diversity Small Grants Program. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

Shearer, J. and J. Erickson. 2005. Finescale Dace: the reintroduction to a glacial relict. South Dakota Department of Game, Fish and Parks. South Dakota Conservation Digest 72(3) 10-11.

South Dakota Department of Game, Fish and Parks (SDGFP). 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: Black Hills Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
Stasiak, R. H. 1977. Morphology and variation in the Finescale Dace, *Chrosomus neogaeus*. Copeia 1977:771-774.
Stasiak, R. and G.R. Cunningham (2006). Finescale Dace (*Phoxinus neogaeus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/finescaledace.pdf (June 5, 2015).

SUMMARY OF UPDATES IN 2020:

In coordination with the West River and Black Hills Fisheries Management Area Strategic Plans and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for both fish management areas have identified waters to sample for nongame species through the 2023 sampling season which will include historic Finescale Dace waterbodies.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. In 2021, a State Wildlife Grant project began to describe the current distribution and estimate population densities of at-risk native fishes in the Black Hills ecoregion with an emphasis on Lake Chub and Longnose Sucker.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. In 2021, a State Wildlife Grant project began to describe the current distribution and estimate population densities of at-risk native fishes in the Black Hills ecoregion with an emphasis on Lake Chub and Longnose Sucker, however no Finescale Dace were sampled. Finescale Dace continue to have a strong broodstock population in the Mud/Cox Lakes. Since 2019, standard surveys in waters with rare species have incorporated standardized nongame sampling procedures.

STATE T&E SPECIES STATUS REVIEW

Species Name: Longnose Sucker, *Catostomus catostomus*

South Dakota Status, including legal status and special listings:

- State threatened, (SD Administrative Rule 41:10:02:06. List of threatened fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S2, (imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 17 August 2015 (NatureServe 2024).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Longnose Sucker are widespread and secure throughout majority of their range, and listed as critically imperiled in South Dakota. The justification for including Longnose Sucker on the first list of state threatened (16 March 1978) fish is unknown but was presumably due to the threat of mining and logging practices, possible climatic conditions and fragmentation from interconnecting waterways of suitable habitat. Based on the presumed limited area of occupancy, separation from other populations, and limited potential for range expansions; Longnose Sucker are extremely vulnerable to extirpation with limited ability for recolonization and continued listed as a state threatened species is recommended.

Description, biology and life history:

Longnose Sucker are elongate, cylindrical suckers with long pointed snouts. They range in color from gray to black with a light colored underside. Breeding males have a wide, crimson band on the side that extends onto the snout and tubercles on the head, anal fin and caudal fin. Lips fleshy, heavily papillose. Lower lip completely divided by ventral notch forming an acute angle (Bailey and Allum 1962; Schlafke et al. 2024). Longnose Sucker spawn in the spring in lakes or shallow slow-flowing streams over gravel substrates (SDGFP 2006). Eggs hatch in 8-14 days. Longnose Sucker become sexually mature at 2-3 years of age and are believed to be long-lived, as marked adult fish have been observed returning for as many as five successive years to spawn (Baxter and Stone 1995; SDGFP 2006). The diet consists primarily of plant material but will also include small crustaceans, snails and insect larvae (SDGFP 2006).

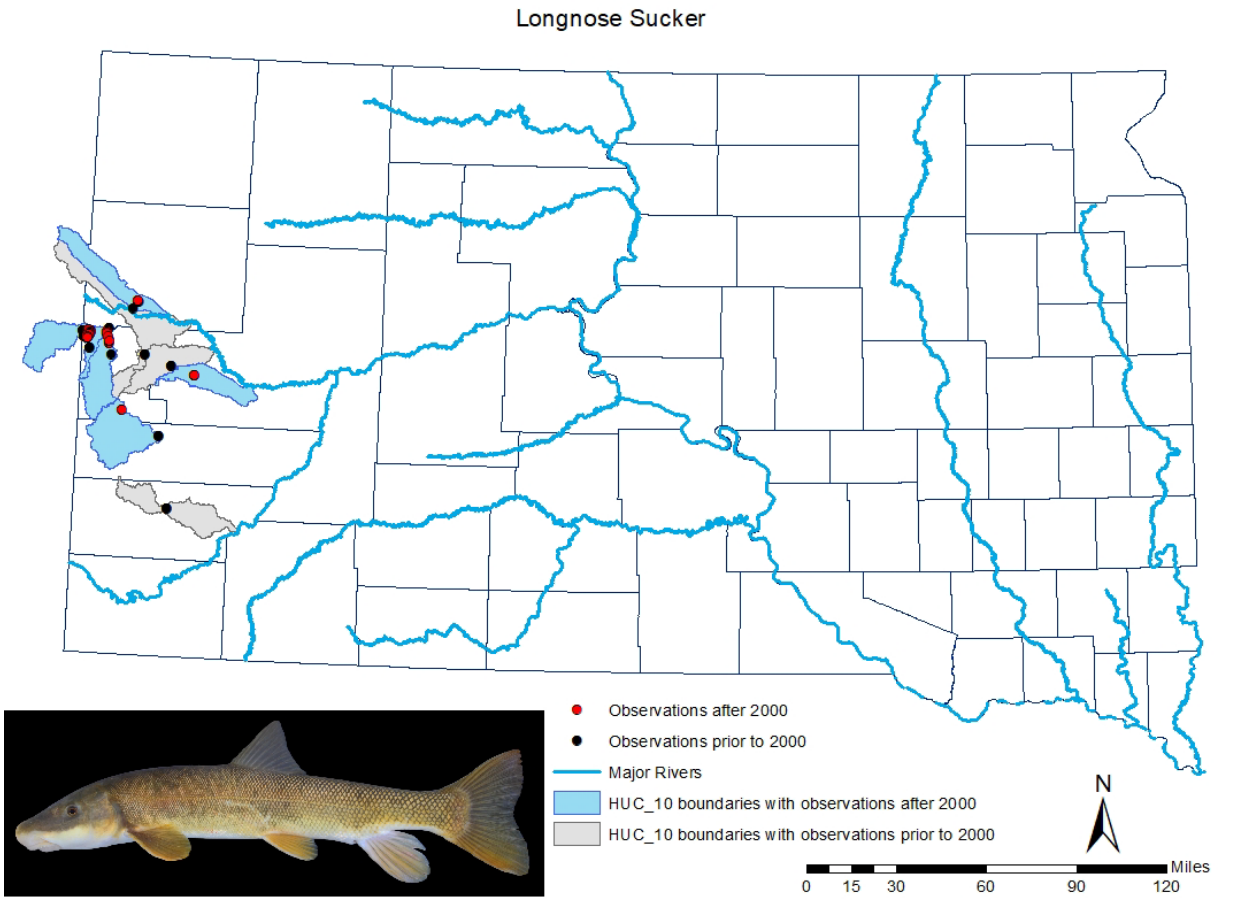
Habitat:

Habitat for Longnose Sucker may be lentic or lotic. Longnose Sucker prefer cool, clear streams and lakes with little to no turbidity and sand or gravel substrates (Baxter and Stone 1995; SDGFP 2006).

Distribution within the state:

Longnose Sucker have been reported from a few cool, spring-fed tributaries of the Belle Fourche (Middle Belle Fourche River HUC_1012020205; Bear Butte Creek

HUC_1012020207; Spearfish Creek HUC_1012020302; Upper Rapid Creek HUC_1012011001; Upper Redwater Creek HUC_1012020303; Belle Fourche Reservoir-Owl Creek HUC_1012020202; Alkali Creek HUC_1012020209) and Cheyenne (French Creek HUC_1012010906) Rivers in the northern Black Hills, which is on the southern periphery of its geographic range (Bailey and Allum 1962; Stewart and Thilenius 1964; Chapman 1989; Olson 1998; Newman 1999). Since 2000, reported Longnose Sucker have been limited to Alkali, Crow, Redwater, and Spearfish creeks, all tributaries to the Belle Fourche River and Belle Fourche Reservoir (Bertrand 2010; Schultz 2011; Conklin and Bergstedt 2012).



*Map updated June 2024

Conservation / Management Considerations:

Longnose Suckers have been impacted by ecosystem alteration/habitat degradation. Longnose Suckers could also be threatened by mining, logging, road construction, and other activities near streams that may affect water quality and temperature. Longnose Sucker are highly vulnerable to climate change due to their need for a specific habitat type (SDGFP 2006, 2014a).

Monitoring and research needs will focus on determining baseline data and status through monitoring efforts, identifying conservation opportunity areas and limiting factors, and researching seasonal movements and recolonization capabilities.

Conservation Efforts in South Dakota:

Conservation efforts will focus on increasing partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff and restoring and maintaining habitat and stream connectivity (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the Black Hills Fisheries Management Plan to standardize survey and sampling protocols and investigate trap and transfer techniques for Longnose Sucker into suitable habitats (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.
- Updating and evaluating the distribution, density, and movement patterns of mountain sucker (*Catostomus platyrhynchus*) in South Dakota – T-63 (2020). Previous studies have shown that the Mountain Sucker occupies less than one-third of its historical distribution in the Black Hills of South Dakota. This study will not only update the distribution of Mountain Sucker but also the Longnose Sucker in the Black Hills.
- The occurrence patterns, current distribution, and population interrelatedness of at-risk fishes in the Black Hills ecoregion – T-93 (2023). Describe the current distribution and estimate population densities of at-risk native fishes in the Black Hills ecoregion with an emphasis on Lake Chub and Longnose Sucker.

Recovery Criteria/Goals

Given that Longnose Sucker have limited natural dispersal abilities and are confined to cool spring-fed waters, the primary recovery goal for the management of the population of Longnose Sucker is to maintain existing populations and distribution, and protect the habitat within watersheds where Longnose Sucker are found. The specific goals of the management of Longnose Sucker are to work with fisheries biologists to standardize stream surveys to monitor populations and work with private land and habitat biologists to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post 2000), and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

Jake Davis, Senior Biologist, GFP, Rapid City
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Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

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References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Baxter, G. T. and M. D. Stone. 1995. Fishes of Wyoming. Wyoming Game and Fish Department, Cheyenne.

Bertrand, K. et al. In preparation. *Fishes of the Dakotas*.

Bertrand, K. 2010. Scientific collector's permit report. South Dakota Department of Game, Fish and Parks, Pierre, SD. Permit numbers 26, 28 and 29.

Chapman, T. 1989. Longnose Sucker status, Belle Fourche Reservoir, Butte County, SD. South Dakota Department of Game, Fish and Parks. 5 pp.

Conklin, D. Jr. and L. Bergstedt. 2012. Scientific collector's permit report. South Dakota Department of Game, Fish and Parks, Pierre, SD. Permit numbers 31 and 34.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 25, 2024).

Newman, R. L. 1999. A biological assessment of four northern Black Hills streams and the reproductive success of longnose dace (*Rhinichthys cataractae*). M. S. Thesis. South Dakota State University, Brookings, South Dakota 2741.

Olson, R. 1998. Finescale Dace and Lake Chub Survey. South Dakota Wildlife Diversity Small Grants Program. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

Schultz, L. 2011. Environmental factors associated with long-term trends of mountain sucker populations in the Black Hills, and an assessment of their thermal tolerance. M.S. Thesis. South Dakota State University, Brookings, South Dakota

South Dakota Department of Game, Fish and Parks. 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: Black Hills Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

Stewart, R. K. and C. A. Thilenius. 1964. Stream and lake inventory and classification in the Black Hills of South Dakota, 1964. SDGFP, Lake and Stream Classification Report. 101 pp.

SUMMARY OF UPDATES IN 2020:

In coordination with the Black Hills Fisheries Management Area Strategic Plan and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better

sample nongame fishes. Currently, workplans for the Black Hills Fisheries Management Area have identified waters to sample for nongame species through the 2023 sampling season which will include historic Longnose Sucker waterbodies.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. In 2021, a State Wildlife Grant project began to describe the current distribution and estimate population densities of at-risk native fishes in the Black Hills ecoregion with an emphasis on Lake Chub and Longnose Sucker. Since the study began 139 Longnose Sucker have been sampled exclusively from Crow and Spearfish Creeks. Species ranking using NatureServe in 2022 to assess extinction risk using standard methods updated the species rank for Longnose Sucker from S1 (critically imperiled) to S2 (imperiled). Major categories assessed during species ranking are rarity, threats, and trends.

SUMMARY OF UPDATES IN 2024:

The project looking at the distribution and populations of at-risk native fishes in the Black Hills ecoregion was completed June 2023. Longnose Sucker were restricted to two major tributaries of the Redwater subbasin (Crow and Spearfish Creeks), where they were more often captured in stream reaches with steep banks and more even substrates. Additionally, Longnose Sucker were more common in areas with greater width-depth ratios and higher species richness. Species-specific genetic variation and degree of gene flow within and between streams was examined for 114 Longnose Sucker. Although Longnose Sucker presence is thought to be restricted to two single tributaries, admixture between individuals found in both streams suggest usage and movement between these streams within the Redwater River subbasin. Aquatic strategic planning efforts continue.

STATE T&E SPECIES STATUS REVIEW

Species Name: Northern Pearl Dace, *Margariscus nachtriebi*

South Dakota Status, including legal status and special listings:

- State threatened, (SD Administrative Rule 41:10:02:06. List of threatened fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S2, (imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 21 December 2017 (NatureServe 2024)
- USDA Forest Service, Region 2, Rocky Mountain Region sensitive species

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Northern Pearl Dace are listed as secure throughout their range, however, listed as imperiled in South Dakota (NatureServe 2016). The justification for including Northern Pearl Dace on the first list of state threatened (16 March 1978) fish is unknown but was presumably due to the need for specific cool, clear headwater habitats and limited survey efforts. Northern Pearl Dace are extremely vulnerable to extirpation with limited ability for recolonization and continued listing as state threatened species is recommended.

Description, biology and life history:

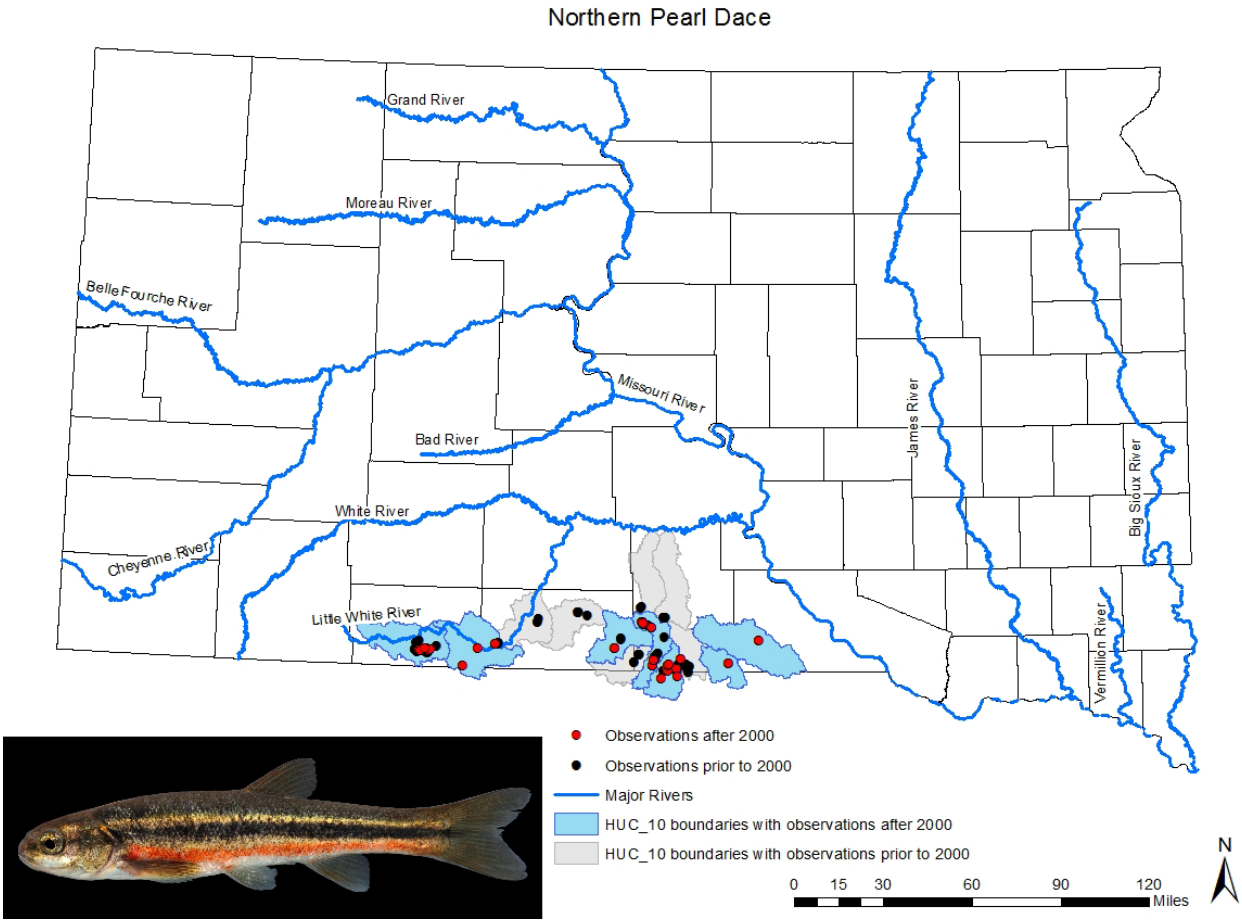
The Northern Pearl Dace is a small fish that is dark olive colored on the back with lighter sides and white belly; a dark lateral band is sometimes present but more distinct on younger individuals (SDGFP 2006; NGPC 2010). Northern Pearl Dace lack a black spot on the anterior portion of the dorsal fin base. The mouth is small and slightly subterminal, rarely reaching past the anterior origin of the eye. Nuptial males have orange-red sides and belly below the dark lateral bad (Schlafke et al. 2024). Little is known about the reproductive biology or life history for Northern Pearl Dace in South Dakota; however it is presumed that they spawn in the spring from April to early June, over gravel substrates (Baxter and Stone 1995; SDGFP 2006). Most individuals live 3 to 4 years (SDGFP 2006). The diet includes copepods, chironomids, molluscs, and other invertebrates along with filamentous algae (Scott and Crossman 1973; Baxter and Stone 1995; SDGFP 2006).

Habitat:

Habitat for Northern Pearl Dace may be lentic or lotic. However, Northern Pearl Dace prefers cool, clear headwater streams, ponds, and small lakes with gravel substrates. Northern Pearl Dace have also been found in association with beaver ponds, and well vegetated stream banks, abundant macrophyte growth and undercut banks (Scott and Crossman 1973; SDGFP 2006; NGPC 2010).

Distribution within the state:

Within South Dakota, Northern Pearl Dace are found west of the Missouri River and have been reported from tributaries of the White, Niobrara and Keya Paha river drainages, which are on the southern periphery of the geographic range for Northern Pearl Dace (Bailey and Allum 1962; Cunningham and Olson 1994; Cunningham et al. 1995; Felts 2013; Schlafke et al. 2024). Since 2000, Northern Pearl Dace have been reported in low numbers from the Little White and Keya Paha river tributaries (Felts 2013; Schlafke et al. 2024).



Conservation / Management Considerations:

Northern Pearl Dace have been impacted by reductions in numbers of beaver dams, ecosystem alteration/habitat degradation, impoundments, channelization, pond drainage, conversion of land to agriculture, and pollution/pesticides/herbicides. Northern Pearl Dace are extremely vulnerable to climate change, due to their need for a specific habitat type (SDGFP 2006, 2014a).

Monitoring and research needs will focus on continuing to expand current monitoring efforts, assessing population dynamics and genetic variation/integrity, identifying conservation opportunity areas and limiting factors, and researching seasonal movements and recolonization capabilities.

Conservation Efforts in South Dakota:

Conservation efforts will focus on preserving suitable habitat, expanding partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the West River Fisheries Management Plans to standardize survey and sampling protocols and examine population status and trends for Northern Pearl Dace (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8 (2013). The Sandhills area of South Dakota is a unique ecosystem that is home to many rare species, relict of Pleistocene Glaciation. This research assessed the current distribution, status and habitat requirements for these glacial relict fishes.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.

Recovery Criteria/Goals

Given that Northern Pearl Dace have limited natural dispersal abilities and are restricted to spring-fed waters, the primary recovery goals for the management of the population of Northern Pearl Dace are to maintain existing populations and protect the habitat within watersheds where Northern Pearl Dace are currently found. Specific strategies of the management of Northern Pearl Dace are to work with fisheries biologists to standardize sampling efforts in coordination with increased river/stream surveys and work with private land and habitat biologists to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

Date Review Completed: June 26, 2024
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References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Baxter, G. T. and M. D. Stone. 1995. Fishes of Wyoming. Wyoming Game and Fish Department, Cheyenne.

Cunningham, G. and R. Olson. 1994. Fish species collected in streams in West River South Dakota-1994. Unpublished report to South Dakota Game, Fish and Parks. Pierre, South Dakota. 10 pp.

Cunningham, G. R., R. D. Olson, and S. M. Hickey. 1995. Fish surveys of the streams and rivers of South Central South Dakota west of the Missouri River. Proc. S.D. Acad. Sci. 74:55-64.
Felts, E. 2013. Ecology of glacial relict fishes in South Dakota's Sandhills region. M.S. Thesis. South Dakota State University, Brookings, South Dakota.
NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 25, 2024).
Nebraska Game and Parks Commission (NGPC). 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln.
Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.
Scott, W. B. and E. J. Crossman. 1973. Freshwater Fishes of Canada. Fisheries Research Board of Canada, Bulletin 184. 966 pp.
South Dakota Department of Game, Fish and Parks (SDGFP). 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: West River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

SUMMARY OF UPDATES IN 2020:

In coordination with the West River Fisheries Management Area Strategic Plan and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for the West River Fisheries Management Area have identified waters to sample for nongame species through the 2023 sampling season which will include historic Northern Pearl Dace waterbodies.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. Since 2019, standard surveys in waters with rare species have incorporated standardized nongame sampling procedures. Tributaries to the Keya Paha drainage are scheduled to be surveyed over the next four years.

STATE T&E SPECIES STATUS REVIEW

Species Name: Northern Redbelly Dace, *Chrosomus eos*

South Dakota Status, including legal status and special listings:

- State threatened, (SD Administrative Rule 41:10:02:06. List of threatened fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3, (vulnerable)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G5 (secure, although it may be rare in some portions of the range); last reviewed 17 August 2015 (NatureServe 2024)
- USDA Forest Service, Region 1, Dakota Prairie Grassland, 2011 aquatic sensitive species
- USDA Forest Service, Region 2, Rocky Mountain Region sensitive species

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Northern Redbelly Dace are listed as secure throughout their range, however, listed as imperiled in South Dakota (NatureServe 2016). The justification for including Northern Redbelly Dace on the first list of state threatened (16 March 1978) fish is unknown but was presumably due to the need for specific spring-fed habitats and fragmentation from interconnecting waterways of suitable habitat. Northern Redbelly Dace are extremely vulnerable to extirpation with limited ability for recolonization and continued listing as state threatened species is recommended.

Description, biology and life history:

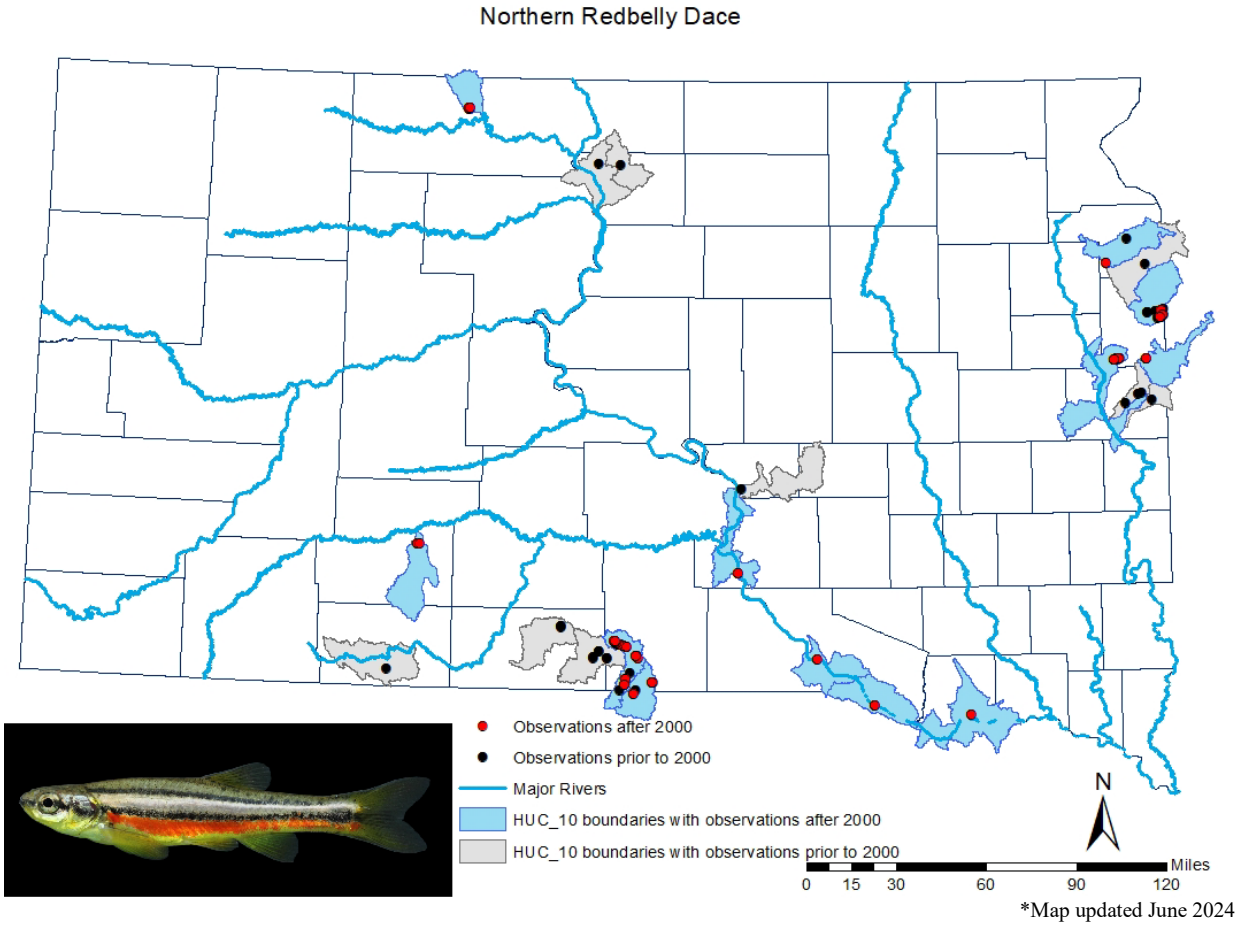
The Northern Redbelly Dace is a small, dark olive to silvery minnow with two dark lateral stripes separated by an iridescent, silvery band on the sides. In breeding males, the silvery belly is reddish in color with yellow fins (NGPC 2010). The mouth is upturned; with the chin anterior to the upper lip (reaching more than halfway to the eye) and the snout is rounded (Schlafke et al. 2024). Little is known about the reproductive biology or life history for Northern Redbelly Dace in South Dakota; however it is presumed that they spawn between late April and June over aquatic vegetation. Eggs hatch within 8-10 days (Faber 1984; SDGFP 2006). Most individuals live 3 to 4 years (NGPC 2010). The diet includes mainly diatoms and filamentous algae, also zooplankton, invertebrates and plant material (SDGFP 2006; NGPC 2010).

Habitat:

Habitat for Northern Redbelly Dace may be lentic or lotic. However, Northern Redbelly Dace prefer spring-fed streams with adequate vegetation; slow to moderate current, and silt or sand substrates. Habitat also includes boggy lakes, ponds, beaver ponds and pools of headwater streams (Lee et al. 1980; SDGFP 2006; NGPC 2010).

Distribution within the state:

Within South Dakota, Northern Redbelly Dace are found primarily east of the Missouri River and have been reported from tributaries of the Missouri, Big Sioux, Minnesota, White, Niobrara and Keya Paha river drainages which are on the southern periphery of the geographic range for Northern Redbelly Dace (Bailey and Allum 1962; McCoy and Hales 1974; Cunningham and Olson 1994; Dieterman and Berry 1994; Cunningham et al. 1995; Cunningham 1999; Heakin et al. 2003; Felts 2013; Schlafke et al. 2024). Since 2000, Northern Redbelly Dace have been reported in low numbers from the Big Sioux, Minnesota, Keya Paha, and Lower Missouri river tributaries (Heakin et al. 2003; Felts 2013; Schlafke et al. 2024).



*Map updated June 2024

Conservation / Management Considerations:

Northern Redbelly Dace have been impacted by reductions in numbers of beaver dams, ecosystem alteration/habitat degradation, mining, logging, construction of roads, heavy grazing, and stream channelization. Northern Redbelly Dace are extremely vulnerable to climate change, due to their need for a specific habitat type (SDGFP 2006, 2014a).

Monitoring and research needs will focus on continuing to expand current monitoring efforts, assessing population dynamics and genetic variation/integrity, identifying conservation opportunity conservation opportunity areas and limiting factors, and researching seasonal movements and recolonization capabilities.

Conservation Efforts in South Dakota:

Conservation efforts will focus on expanding partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the East River, West River, and Missouri River Fisheries Management Plans to standardize survey and sampling protocols and examine population status and trends for Northern Redbelly Dace (SDGFP 2014b, 2014c, 2014d).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Comprehensive aquatic survey of the Minnesota River tributaries – T-17 (2008). This unique aquatic ecosystem in northeastern South Dakota was sampled for fish, mussels, and aquatic invertebrates to identify species composition, with an emphasis on identifying sites with rare aquatic species.
- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8 (2013). The Sandhills area of South Dakota is a unique ecosystem that is home to many rare species, relict of Pleistocene Glaciation. This research assessed the current distribution, status and habitat requirements for these glacial relict fishes.
- Small stream fish ladders for steel culverts– T-67 (2016). Assessing the use of fish ladder designs to estimate the increase in passability of round galvanized steel culverts in natural streams in both eastern and western South Dakota.
- Evaluation of the James River Conservation Reserve Enhancement Program (CREP) of South Dakota– T-59 (2018). The CREP seeks to enhance natural resource conservation programs in selected watersheds nationwide to address specific regional conservation priorities by attempting to alleviate agriculturally related environmental concerns. This project assesses the effects of CREP on water quality, aquatic habitats, fish assemblages, and avifauna response to the James River CREP.

Recovery Criteria/Goals

Given that Northern Redbelly Dace have limited natural dispersal abilities and are restricted to spring-fed waters, the primary recovery goals for the management of the population of

Northern Redbelly Dace are to maintain existing populations and protect the habitat within watersheds where Northern Redbelly Dace are currently found. Specific strategies of the management of Northern Redbelly Dace are to work with fisheries biologists to standardize sampling efforts in coordination with increased river/stream surveys and work with private land and habitat biologists to develop site specific best management practices to ensure habitat protection. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:
Eileen Dowd Stukel, Senior Wildlife Biologist, SDGFP, Pierre

Date Review Completed: June 26, 2024
Date Adopted by GFP Commission: April 6, 2018
Dates of Other Reviews, if appropriate: December 14, 2017, June 10, 2020, June 10, 2022

References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Cunningham, G. 1999. Rare fish surveys in selected streams of eastern South Dakota. South Dakota Small Grants Program. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Cunningham, G. and R. Olson. 1994. Fish species collected in streams in West River South Dakota-1994. Unpublished report to South Dakota Game, Fish and Parks. Pierre, South Dakota. 10 pp.

Cunningham, G. R., R. D. Olson, and S. M. Hickey. 1995. Fish surveys of the streams and rivers of South Central South Dakota west of the Missouri River. Proc. S.D. Acad. Sci. 74:55-64.

Dieterman, D. J. and C. R. Berry, Jr. 1994. Fishes in seven streams of the Minnesota River drainage in northeastern South Dakota. Proc. S. D. Acad. Sci. 74:23-30.

Faber, D. J. 1985. The early development of the northern redbelly dace, *Phoxinus eos* (Cope). Canadian Journal of Zoology 63:1724-1729.

Felts, E. 2013. Ecology of glacial relict fishes in South Dakota's Sandhills region. M.S. Thesis. South Dakota State University, Brookings, South Dakota 2933.

Heakin, A., N. Morey, and C. Berry, Jr. 2003. Environmental monitoring and assessment program activities in South Dakota. Annual Progress Report Submitted to the South Dakota Department of Game, Fish and Parks by the U.S. Geological Survey.

Lee, D. S., C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr. 1980. Atlas of North American freshwater fishes. North Carolina State Museum of Natural History, Raleigh, North Carolina. 854 pp.

McCoy, R. W. and D. C. Hales. 1974. A survey of eight streams in eastern South Dakota: Physical and chemical characteristics, vascular plants, insects and fishes. Proc. S. S. Acad. Sci. 53:202-219.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 25, 2024).

Nebraska Game and Parks Commission (NGPC). 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

South Dakota Department of Game, Fish and Parks (SDGFP). 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: East River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014c. Fisheries and aquatic resources adaptive management system 2014-2018: West River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014d. Fisheries and aquatic resources adaptive management system 2014-2018: Missouri River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

SUMMARY OF UPDATES IN 2020:

In coordination with the East River, West River and Missouri River Fisheries Management Area Strategic Plans and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for all fish management areas have identified waters to sample for nongame species through the 2023 sampling season which will include historic Northern Redbelly Dace waterbodies.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. Species ranking using NatureServe in 2022 to assess extinction risk using standard methods updated the species rank for Northern Redbelly Dace S2 (imperiled) to S3 (vulnerable). Major categories assessed during species ranking are rarity, threats, and trends.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. Since 2019, standard surveys in waters with rare species have incorporated standardized nongame sampling procedures. Recent occurrences have been documented in Peg Munky Run, a tributary to the Big Sioux River and Gary Creek, a tributary to West Branch Lac Qui Parle River. Tributaries to the Keya Paha drainage are scheduled to be surveyed over the next four years.

STATE T&E SPECIES STATUS REVIEW

Species Name: Pallid Sturgeon, *Scaphirhynchus albus*

South Dakota Status, including legal status and special listings:

- State endangered, (SD Administrative Rule 41:10:02:05. List of endangered fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S2, (imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- Federal endangered, (55 FR 36641-36647). Federal recovery plan finalized in 1993 (USFWS 1993) and a revised recovery plan was finalized in 2014 (USFWS 2014).
- NatureServe global rank G2 (imperiled, large range and area of occupancy in larger channels of the Mississippi-Missouri river system and Atchafalaya River; range much reduced by dams in the upper Missouri River; habitat changes and barriers have resulted in limited natural recruitment and continuing declines in wild populations in the Missouri River basin; last reviewed 21 November 2018).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Pallid Sturgeon are listed as imperiled and rare throughout their range, and listed as critically imperiled in South Dakota. The justification for including Pallid Sturgeon on the first list of state endangered (16 March 1978) fish is unknown. Limiting factors include activities which affect in-river connectivity and the natural form, function, and hydrologic processes of rivers; illegal harvest; impaired water quality and quantity; entrainment; and life history attributes of the species (i.e. delayed sexual maturity, females do not spawn every year and larval drift requirements). Despite increased sampling efforts and improved species status within the lower portions of their range (Mississippi and Atchafalaya rivers), data regarding natural recruitment, mortality, habitat use, and abundance remain limited (USFWS 2014). And without supplementation efforts, the species faces local extirpation within several reaches, therefore continued listing as a state endangered species is recommended.

Description, biology and life history:

The Pallid Sturgeon is a primitive fish with a cartilaginous skeleton. Pallid Sturgeon have long, slender grey-white body with a flattened shovel-shaped snout. Pallid Sturgeon have embedded scutes or bony plates that armor their dorsal surface and sides but have naked or smooth bellies. Origins of fringed inner chin barbels are half as long and anterior to origins of two outer barbels (Schlafke et al. 2024). Pallid Sturgeon are similar in appearance to the more common Shovelnose Sturgeon. Pallid Sturgeon spawn from June through August with fecundity related to body size (40,000-150,000 eggs) (Keenlyne et al. 1992; SDGFP 2006a; George et al. 2012). Pallid Sturgeon can be long-lived, with females reaching sexual maturity later than males (Keenlyne and Jenkins 1993). Sexual maturity can vary between hatchery-reared and wild fish and is dependent on local conditions. For wild fish, estimated age at first reproduction was 15-20 years for females and approximately 5 years for males (Keenlyne and Jenkins 1993). Hatchery-reared Pallid Sturgeon attained sexual maturity

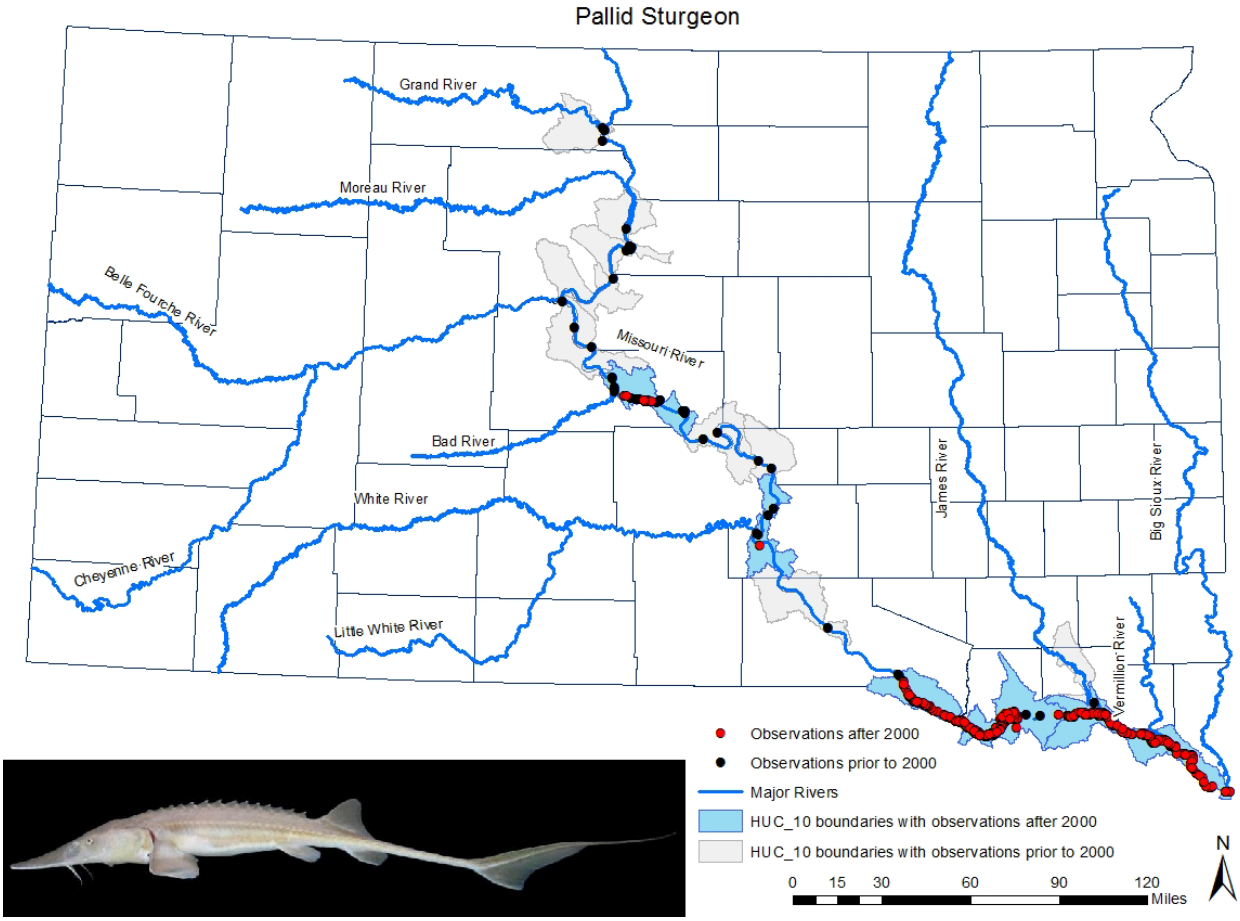
between 6-9 years (Steffensen 2012; USFWS 2014). Females do not spawn each year, spawning every 2-3 years (Kallemeyn 1983; USFWS 2014). Pallid Sturgeon diets are generally composed of fish and aquatic insect larvae (SDGFP 2006a; USFWS 2014).

Habitat:

Habitat for the Pallid Sturgeon is lotic, as they are a bottom-oriented, large river fish inhabiting the Missouri and Mississippi rivers. The Pallid Sturgeon evolved and is adapted to the pre-development habitat conditions that historically existed in these rivers. These conditions generally can be described as large, free-flowing, and turbid rivers with a diverse assemblage of dynamic physical habitats (Pflieger 1975; Kallemeyn 1983; USFWS 2014).

Distribution within the state:

Pallid Sturgeon historically were reported throughout the Missouri River in South Dakota, which is within the northcentral part of the range (Bailey and Allum 1962; SDGFP 2006a; USFWS 2014). Since 2000, Pallid Sturgeon have been reported in low relative numbers from the Missouri River between Fort Randall and Gavins Point dams and downstream from Gavins Point Dam (Shuman et al. 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013; Shuman and Klumb 2012; Stukel et al. 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014; Pierce et al. 2014; USFWS 2014; Schlafke et al. 2024). In 2004, a single Pallid Sturgeon was netted during Paddlefish surveys from Lake Francis Case (Schlafke et al. 2024). In 2006, USFWS and GFP staff participated in a collaborative gillnetting effort to search for remnant Pallid Sturgeon for hatchery broodstock in Lake Sharpe. Subsequent sampling efforts on Lake Sharpe have not produced any Pallid Sturgeon. The majority of Pallid Sturgeon collected are of hatchery origin or translocated fish that were used for broodstock production.



Conservation / Management Considerations:

Pallid Sturgeon have been impacted by large river habitat alterations, including river channelization, impoundment, and altered flow regimes, water quality (pollution/pesticides/herbicides), entrainment, and hybridization with Shovelnose Sturgeon. It is also suggested that Pallid Sturgeon are moderately vulnerable to climate change (SDGFP 2014a; USFWS 1993, 2014). The effects from dams (i.e. altered hydrographs and temperature profiles, altered ecologic processes, habitat fragmentation, and conversion of riverine reaches to reservoirs) may be the single greatest factors affecting Pallid Sturgeon in South Dakota.

Monitoring and research needs should continue to expand current monitoring efforts, while developing standardized protocols for monitoring all life history stages of Pallid Sturgeon. Additionally, research needs will evaluate the role of sediment transport and discharge on the creation and maintenance of habitats for all life stages, identifying limiting factors associated with natural recruitment, research spawning and potential natural recruitment on the James River and below Gavins Point Dam and researching seasonal movements (SDGFP 2014a).

Conservation Efforts in South Dakota:

Past:

More than 90,000 acres of land were transferred from the U.S. Army Corps of Engineers (USACE) to the State of South Dakota as a result of the Water Resources Development Act of 1999. Land transferred to the State of South Dakota is managed by Wildlife and/or Parks and Recreation divisions of South Dakota Department of Game, Fish and Parks (GFP). Two products resulted from GFP's expanded role in endangered species management along the Missouri River; 1) an interagency Memorandum of Agreement (MOA) regarding endangered species protection and recovery along the river, and 2) a state management plan for the Pallid Sturgeon (SDGFP 2006b).

The first 5-year Missouri River endangered species interagency MOA was finalized in 2001 and included specific and shared commitments of 3 agencies; GFP, USACE, and the U.S. Fish and Wildlife Service (USFWS). Subsequent MOAs included the National Park Service (NPS) in addition to the original 3 agencies. MOA accomplishments by all participants have been summarized by GFP and include such activities as biological surveys and production, specific protocols or policies developed to help implement the MOA, outreach and educational efforts related to Missouri River endangered species, law enforcement efforts, and relevant Section 7 consultations among federal agencies.

As GFP assumed responsibility for additional ownership and management of lands along the Missouri River, concern increased about the possibility of needing permission for incidental take. State management plans were prepared for the 4 species covered by the MOA as part of an agency intention to submit a habitat conservation plan to allow incidental take of federal listed species. Management plans were prepared for the Pallid Sturgeon and Bald Eagle. Piping Plover and Interior Least Tern were covered in one plan. The HCP was not formally pursued.

The state management plan (SDGFP 2006b) listed the following components of Pallid Sturgeon recovery in South Dakota:

1. Participate in a river-wide Pallid Sturgeon monitoring projected funded by the USACE.
2. Broodstock recovery from Lake Sharpe for augmentation
3. Pallid Sturgeon stocking
4. Participate in the Missouri River Natural Resources Committee, Mississippi Interstate Cooperative Resources Association, Great Plains Fisheries Workers Association, Missouri River Restoration Program/Task Force, a part of the Missouri River Trust Missouri River Association of States and tribes (MORAST), Upper and Middle Basin Workgroups and in development of the Missouri River Recovery Implementation Committee (MRRIC).
5. Provide input on the Corps' Annual Operating Plan (AOP)
6. Increase public knowledge and interest in Pallid Sturgeon

Ongoing:

As of October 2015, a new 5-year Missouri River Endangered Species MOA went into effect. The purpose of the MOA is to provide guidance and specific agency commitments for

management, protection, and recovery of the Least Tern, Piping Plover, Pallid Sturgeon, and Bald Eagle along the Missouri River for the 4 signatory agencies (GFP, USFWS, USACE, and NPS). It is the intent of the signatory agencies to cooperatively commit to protect and manage Pallid Sturgeon through law enforcement and public outreach and their habitat by minimizing threats from existing and proposed human activities.

The Pallid Sturgeon Population Assessment team was assembled to initiate a comprehensive monitoring plan designed to assess survival, movement, distribution, and habitat use of wild and hatchery reared (stocked) Pallid Sturgeon. The Population Assessment Team consists of field crews from several state and federal agencies. The Missouri River was divided into 14 sampling segments for this project. These segments were designated by commonalities in habitat conditions. Each field crew is responsible for sampling one or two segments of the river using standardized methods. Habitat classification, gear deployment, and reporting are all guided by a set of standard operation procedures produced by the team (Welker 2012).

Since 2005, the GFP Sturgeon Crew has monitored Segment 7 (of 14) on the Missouri River for Pallid Sturgeon and other native fish populations. This Segment is located between Gavins Point Dam and Ponca State Park, NE (miles 811 to 752). Segment 7 coincides with the lower (59-mile) reach of Missouri National Recreational River.

In addition GFP continues to be an active partner and participant in the Missouri River Natural Resources Committee, Mississippi Interstate Cooperative Resources Association, Great Plains Fisheries Workers Association, MORAST, and MRRIC.

Future:
GFP intends to continue its participation in the multiagency Missouri River endangered species MOA. GFP further intends to assist with new recovery goals established in the revised Pallid Sturgeon Recovery Plan (USFWS 2014).

Additionally, conservation efforts will focus on increasing partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce/limit soil erosion and nutrient/pesticide runoff, maintaining/restoring natural hydrology and stream connectivity when possible, developing captive breeding and stocking programs, and river corridor habitat protection through conservation programs/incentives or purchase (SDGFP 2006b, 2014a). In addition, objectives and strategies will follow those outlined within the Missouri River Fisheries Management Plan to incorporate Pallid Sturgeon population assessment program information into survey and management strategies (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Development and application of a habitat assessment tool for juvenile Pallid Sturgeon in the upper Missouri River – T-24 (2008). This study was designed to provide a better understanding of the habitat requirements and food habits of juvenile Pallid Sturgeon in the Missouri River.
- Evaluation of the James River Conservation Reserve Enhancement Program (CREP) of South Dakota– T-59 (2017). The CREP seeks to enhance natural resource conservation

programs in selected watersheds nationwide to address specific regional conservation priorities by attempting to alleviate agriculturally related environmental concerns. This project assesses the effects of CREP on water quality, aquatic habitats, fish assemblages, and avifauna response to the James River CREP.

- Population characteristics, movement, and habitat use of Shovelnose Sturgeon in Lake Sharpe, South Dakota- T-72 (2021). This study was designed to provide a better understanding of the population demographics of Shovelnose Sturgeon in Lake Sharpe, however has the potential to sample Pallid Sturgeon as well.

Recovery Criteria/Goals

GFP intend to continue its participation in the multiagency Missouri River endangered species MOA. Despite having state specific management actions in the state management plan, South Dakota will cooperate with the USFWS in meeting recovery goals described in the revised federal recovery plan, because this revised federal plan will reflect the most current scientific and management information (SDGFP 2006b; USFWS 2014).

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

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Nathan Loecker, Fisheries Biologist, GFP, Sioux Falls
Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

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Dates of Other Reviews, if appropriate: December 14, 2017, June 12, 2020, June 10, 2022

References:

George, S. G., W. T. Slack, and J. J. Hoover. 2012. A note on the fecundity of Pallid Sturgeon. Journal of Applied Ichthyology. 28(4): 512-515.

Keenlyne, K. D., E. M. Grossman, and L. G. Jenkins. 1992. Fecundity of the Pallid Sturgeon. Transactions of the American Fisheries Society 121:139-140.

Klumb, R. A., D. A. Shuman, D. A. James, and K. L. Grohs. 2012. Movement Patterns of Age-1 and Age-7 Pallid Sturgeon Within the Missouri River During Record 2011 Discharges Downstream of Fort Randall Dam. Progress Report Prepared for WAPA, Billings, Montana and the Upper Basin Pallid Sturgeon Workgroup USFWS, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota.

Missouri River Recovery Program. Pallid Sturgeon and Associated Fish Community Population Assessment website: http://moriverrecovery.usace.army.mil/mrrp/f?p=136:155:12288912760890:: NO::PIS_ID:44.

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: June 25, 2024).

Pierce, L., D. A. Shuman, R. A. Klumb, D. A. James, and K. L. Grohs. 2014. 2013 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 144 pp.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

Shuman, D. A, R. A. Klumb, and S. T. McAlpin. 2005. 2004 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 129 pp.

Shuman, D. A., G. A. Wanner, and R. A. Klumb. 2006. 2005 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 191 pp.

Shuman, D. A., G. A. Wanner, R. A. Klumb, and W. J. Stancill. 2007. 2006 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 116 pp.

Shuman, D. A., G. A. Wanner, and R. A. Klumb. 2008. 2007 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 132 pp.

Shuman, D. A., R. A. Klumb, and G. A. Wanner. 2009. 2008 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 132 pp.

Shuman, D. A., R. A. Klumb, K. L. Grohs, and G. A. Wanner. 2010. 2009 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 133 pp.

Shuman, D. A., R. A. Klumb, G. A. Wanner, and K. L. Grohs. 2011. 2010 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 139 pp.

Shuman, D. A. and R. A. Klumb. 2012. 2011 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 134 pp.

Shuman, D. A., R. A. Klumb, D. A. James, and K. L. Grohs. 2013. 2012 annual report. Pallid sturgeon population assessment and associated fish community monitoring for the Missouri River: Segments 5 and 6. U.S. Fish and Wildlife Service, Great Plains Fish and Wildlife Conservation Office, Pierre, South Dakota. Prepared for the U.S. Army Corps of Engineers – Missouri River Recovery Program. 165 pp.

South Dakota Department of Game, Fish and Parks (SDGFP). 2006a. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

South Dakota Department of Game, Fish and Parks (SDGFP). 2006b. South Dakota Pallid Sturgeon (*Scaphirhynchus albus*) Management Plan. Wildlife Division Report 2006-01. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: Missouri River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

Stukel, S., J. Kral, and S. LaBay. 2006. 2005 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 171 pp.

Stukel, S., J. Kral, and S. LaBay. 2007. 2006 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 129 pp.
Stukel, S., J. Kral, and S. LaBay. 2008. 2007 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 167 pp.
Stukel, S., J. Kral, and S. LaBay. 2009. 2008 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 148 pp.
Stukel, S., J. Kral, and S. LaBay. 2010. 2009 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 126 pp.
Stukel, S., J. Kral, N. Loecker, and S. LaBay. 2011. 2010 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 125 pp.
Stukel, S., J. Kral, and N. Loecker. 2012. 2011 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 114 pp.
Stukel, S., J. Kral, and N. Loecker. 2013. 2012 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 126 pp.
Stukel, S., N. Loecher, and J. Kral. 2014. 2013 Annual Report. Pallid Sturgeon population assessment and associated fish community monitoring for the Missouri River: Segment 7. Prepared for the U.S. Army Corps of Engineers-Missouri River Recovery Program. South Dakota Game, Fish, and Parks. 125 pp.
U.S. Fish and Wildlife Service (USFWS). 1993. Pallid Sturgeon (*Scaphirhynchus albus*) Recovery Plan. USFWS, Bismarck, North Dakota. 55 pp.
U.S. Fish and Wildlife Service (USFWS). 2014. Revised Recovery Plan for the Pallid Sturgeon (*Scaphirhynchus albus*). USFWS, Billings, Montana. 115 pp.
Welker, T. L. (editor), 2012. Missouri River Standard Operating Procedures for Fish Sampling and Data Collection, Volume 1.4. U.S. Army Corps of Engineers, Omaha District, Yankton, SD.

SUMMARY OF UPDATES IN 2020:

As of September 30, 2017, a contract with the Corps to conduct fish community monitoring on the lower Missouri River in South Dakota was not renewed which ended the GFP's 13th year of sampling in Segment 7 of the lower Missouri River (59-mile reach of unchannelized Missouri River between Gavins Point Dam and Ponca, Nebraska). GFP continues its participation as a signatory on the Missouri River Endangered Species Memorandum of Agreement and remains an active participant in Pallid Sturgeon recovery.

In coordination with the Missouri River Fisheries Management Area Strategic Plan and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for the Missouri River Fisheries Management Area have identified areas throughout the Missouri River reservoirs and its unchannelized reaches to sample for nongame species through the 2023 sampling season which will include Pallid Sturgeon habitats.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. The USFWS completed a 5 year review for Pallid Sturgeon August 23, 2021.

STATE T&E SPECIES STATUS REVIEW

Species Name: Sicklefin Chub, *Macrhybopsis meeki*

South Dakota Status, including legal status and special listings:

- State endangered, (SD Administrative Rule 41:10:02:05. List of endangered fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S1, (critically imperiled)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- NatureServe global rank G3 (vulnerable, range in the Mississippi and Missouri rivers and their major tributaries has decreased substantially, due to human-caused habitat alteration/fragmentation); last reviewed 30 April 2012 (NatureServe 2014).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Sicklefin Chub are vulnerable and rare throughout their range, and listed as critically imperiled in South Dakota. Previously listed as state threatened (16 March 1978), the Sicklefin Chub was listed state endangered on 29 January 2007. Prior to impoundment of the Missouri River in South Dakota, records indicated Sicklefin Chub were present from Sioux City, IA upstream to the Grand River confluence. At the time of the last status change (2007) only two individuals were documented in South Dakota. One individual was collected in 1996 near Burbank, South Dakota during a four year benthic fish study designed to document the benthic fish assemblage of the entire Missouri River (Young 2001). The other individual fish was collected in 2005 by South Dakota Game, Fish and Parks staff during the Pallid Sturgeon Assessment project (Schlafke et al. 2024). Since the last state status change, Sicklefin Chub have been limited to the Missouri River below Gavins Point Dam, Yankton County. Due to reservoir impoundment Sicklefin Chub are currently isolated and restricted to the Missouri River below Gavins Point Dam, leaving Sicklefin Chub vulnerable to extirpation with limited ability for recolonization. Continued listing as state endangered is recommended.

Description, biology and life history:

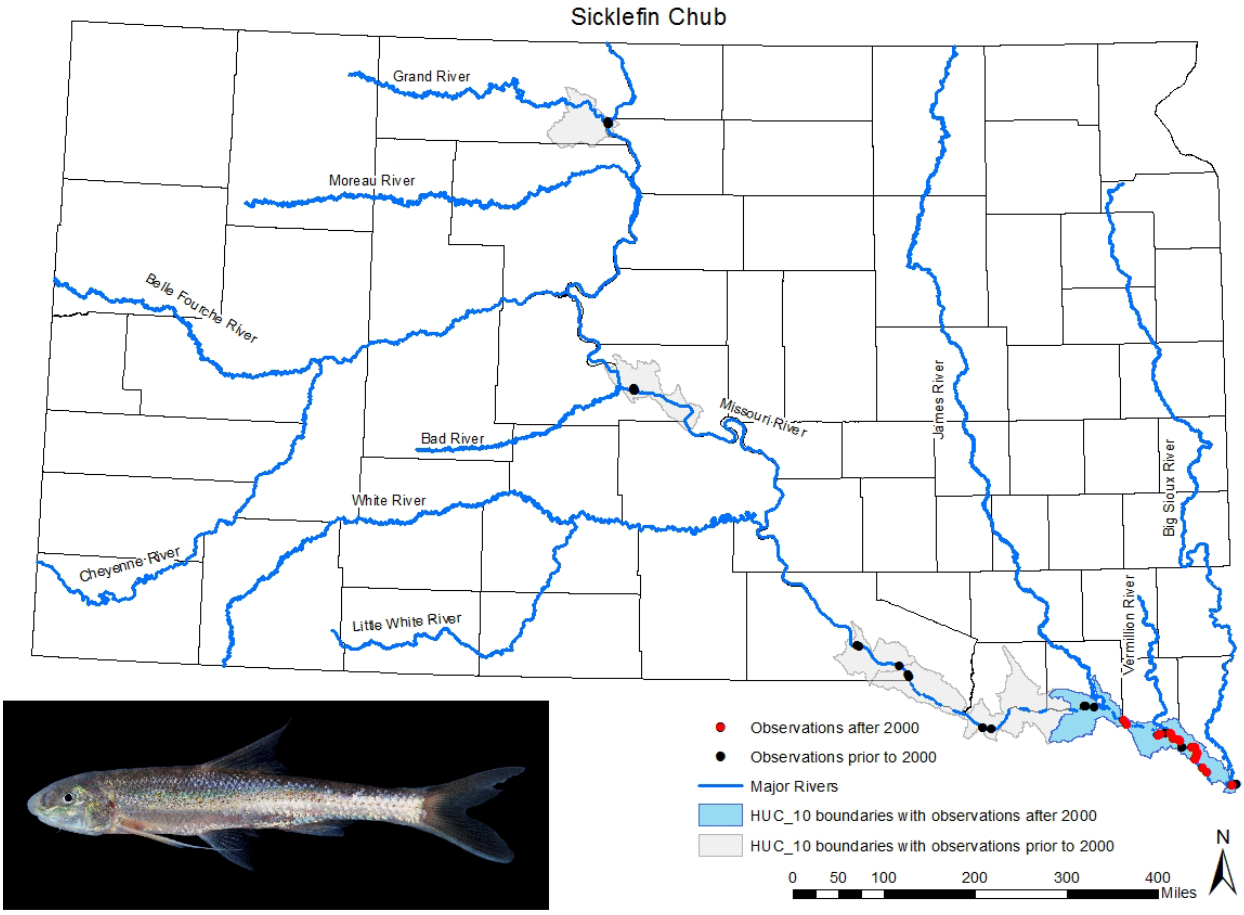
The Sicklefin Chub is a small, slender bodied minnow with small eyes and long sickle shaped pectoral fins. The Sicklefin Chub's body is yellowish-brown with a silvery-white belly and conspicuous barbels at the corners of the mouth (NGPC 2010). The dorsal fin's origin is over or slightly behind the pelvic fin origin (Schlafke et al. 2024). Little is known of the reproductive biology of Sicklefin Chub; however, it is presumed that they spawn during spring to early summer. Individuals are sexually mature at 2-3 years of age and live up to 4 years (SDGFP 2006; Dieterman et al. 2006; USFWS 2008). Little is known about the diet of Sicklefin Chub, but it's believed to be a bottom feeder (NGPC 2010).

Habitat:

Habitat for the Sicklefin Chub is lotic, as they prefer the main channels of large, turbid rivers with strong currents and sand or fine gravel substrates (Pflieger 1975).

Distribution within the state:

Sicklefin Chub are reported within the Missouri River (Grand River Bay-Lake Oahe HUC_1013010215; Peoria Flats-Lake Oahe HUC_1014010103; Whetstone Creek-Missouri River HUC_1014010118; Randall Creek-Missouri River HUC_1017010104; Lewis & Clark Lake-Missouri River HUC_1017010109; Beaver Creek-Missouri River HUC_1017010112; Lime Creek-Missouri River HUC_1017010115) in South Dakota, which is on the northern periphery of the geographic range for Sicklefin Chub (Bailey and Allum 1962; Werdon 1992; Young 2001). Since 2000, reported Sicklefin Chub have been of individual fish and limited to the lower Missouri River below Gavins Point Dam (Schlafke et al. 2024).



Conservation / Management Considerations:

Sicklefin Chub have been impacted by ecosystem alteration/habitat degradation and ecosystem/habitat conversion/loss associated with the development and operation of reservoirs on large rivers. These disrupt water regimes due to the combination of modified flow/temperature regimes and sediment transport, channelization, water diversion, fragmentation of once continuous rivers, and reductions in turbidity. It is suggested that Sicklefin Chub are moderately vulnerable to climate change (USFWS 1993, 2001; SDGFP 2014a).

Monitoring and research needs will focus on determining baseline data and status through monitoring efforts and identifying conservation opportunity areas and limiting factors.

Conservation Efforts in South Dakota:

Conservation efforts will focus on increasing partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce water diversion, and maintaining/restoring natural hydrology and stream connectivity when possible (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the Missouri River Fisheries Management Plan to standardize survey and sampling protocols to monitor non-game fishes (SDGFP 2014b).

State Wildlife Grant Accomplishments:

- Evaluation of the James River Conservation Reserve Enhancement Program (CREP) of South Dakota– T-59 (2017). The CREP seeks to enhance natural resource conservation programs in selected watersheds nationwide to address specific regional conservation priorities by attempting to alleviate agriculturally related environmental concerns. This project assesses the effects of CREP on water quality, aquatic habitats, fish assemblages, and avifauna response to the James River CREP.
- Population structure and habitat use of benthic fishes of the Missouri River and its major tributaries with an emphasis on Sicklefin and Sturgeon Chub in South Dakota- T-89 (2022). Sicklefin and Sturgeon Chub, state listed endangered and threatened respectively, have been petitioned for federal listing and currently are undergoing a 12-month finding. This study will update the distribution and status of this fish assemblage with an emphasis on Sicklefin and Sturgeon Chub, two rare species in South Dakota.

Recovery Criteria/Goals

Given that Sicklefin Chub have limited natural dispersal abilities the primary recovery goal for the management of Sicklefin Chub is to maintain existing populations, and protect the habitat within watersheds where Sicklefin Chub is found, especially tributary populations. There are three aspects to Sicklefin Chub management in South Dakota. Goals will work to increase sampling regime standardization among fisheries biologists in coordination with reservoir surveys. Improved coordination with private land and habitat biologist should be utilized in the development of site-specific best management practices to ensure habitat protection. The protection of conservation opportunity areas should be promoted by maintaining natural flow regimes in tributary areas where the species is present. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and evidence of natural reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

Sam Stukel, Fish and Wildlife Biologist, USFWS, Gavins Point National Fish Hatchery, Yankton
Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre
Nathan Loecker, Fisheries Biologist, GFP, Yankton

Date Review Completed: June 27, 2024
Date Adopted by GFP Commission: April 6, 2018
Dates of Other Reviews, if appropriate: December 14, 2017, June 12, 2020, June 10, 2022

References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Bertrand, K. et al. In preparation. *Fishes of the Dakotas*.

Dieterman, D. J., E. Roberts, P. J. Braaten, and D. L. Galat. 2006. Reproductive development in the Sicklefin Chub in the Missouri and Lower Yellowstone Rivers. The Prairie Naturalist 38(2): 113-130.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.naturserve.org. (Accessed: October 3, 2014).

Nebraska Game and Parks Commission. 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln.

Pflieger, W. L. 1975. Fishes of Missouri. Missouri Department of Conservation. 343 pp.

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

South Dakota Department of Game, Fish and Parks. 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: Missouri River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.

U.S. Fish and Wildlife Service. 1993. Status report on Sicklefin Chub (*Macrhybopsis meeki*), a candidate endangered species. United States Department of the Interior, Region 6, Denver, Colorado.

U.S. Fish and Wildlife Service. 2001. Updated status review of Sicklefin and Sturgeon Chub. United States Department of the Interior, Region 6, Denver, Colorado.

U.S. Fish and Wildlife Service. 2008. Three year summary age and growth report for Sicklefin Chub (*Macrhybopsis meeki*): Pallid Sturgeon population assessment project and associated fish community monitoring for the Missouri River. Prepared for the U.S. Army Corps of Engineers Northwest Division. U.S. Fish and Wildlife Service. Region 6, Columbia, Missouri.

U.S. Fish and Wildlife Service (USFWS). 2023. Species Status Assessment for the Sturgeon and Sicklefin Chub. USFWS, Pierre, South Dakota. 30 pp.

Werdon, S. J. 1992. Population status and characteristics of *Macrhybopsis gelida*, *Platygobio gracilis*, and *Rhinichthys cataractae* in the Missouri River basin. M.S. Thesis. South Dakota State University, Brookings, South Dakota.

Young, B. A. 2001. Intraspecific variation among emerald shiners (*Notropis atherinoides*) of the Missouri River. Ph.D. Dissertation. South Dakota State University, Brookings, South Dakota.

SUMMARY OF UPDATES IN 2020:

As of September 30, 2017, a contract with the Corps to conduct fish community monitoring on the lower Missouri River in South Dakota was not renewed which ended the GFP's 13th year of sampling in Segment 7 of the lower Missouri River (59-mile reach of unchannelized Missouri River between Gavins Point Dam and Ponca, Nebraska). GFP continues its participation as a signatory on the Missouri River Endangered Species Memorandum of Agreement.

In coordination with the Missouri River Fisheries Management Area Strategic Plan and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for the Missouri River Fisheries Management Area have identified areas throughout the Missouri River reservoirs and its unchannelized reaches to sample for nongame species through the 2023 sampling season which will include Sicklefin Chub habitats.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. In 2020, a State Wildlife Grant project began to describe the population structure and habitat use of benthic fishes of the Missouri River and its major tributaries with an emphasis on Sicklefin and Sturgeon Chub in South Dakota.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. The project looking to describe the population structure and habitat use of benthic fishes of the Missouri River and its major tributaries was completed December 2022, no Sicklefin Chub were sampled in this study.

The U.S. Fish and Wildlife Service (the Service) published a not-warranted 12-month finding for the Sturgeon Chub and Sicklefin Chub in the *Federal Register*, September 20, 2023. The Service completed a species status assessment (SSA) report which communicates the results of the comprehensive biological status review. The USFWS determined that the Sturgeon Chub and Sicklefin Chub are not at risk of extinction now or in the foreseeable future. Therefore, the listing is not warranted (USFWS 2023).

The Sicklefin Chub is a small minnow that inhabits large, turbid rivers, including the mainstem Missouri and Mississippi Rivers that have evolved specific adaptations to turbid, riverine habitats. This species also has a widespread distribution and currently occupies 75 percent of its historical range across 13 States (Montana, North Dakota, South Dakota, Nebraska, Kansas, Iowa, Missouri, Illinois, Arkansas, Tennessee, Kentucky, Mississippi and Louisiana).

STATE T&E SPECIES STATUS REVIEW

Species Name: Sturgeon Chub, *Macrhybopsis gelida*

South Dakota Status, including legal status and special listings:

- State threatened, (SD Administrative Rule 41:10:02:05. List of threatened fish)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3, (vulnerable)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan

Federal Status:

- USDA Forest Service, Region 2, Rocky Mountain Region sensitive species
- NatureServe global rank G3 (vulnerable, historically occurred in the Mississippi, Missouri, and Yellowstone rivers and 30 tributaries of the Missouri and Yellowstone rivers; has declined in range and abundance due to human-caused habitat changes (e.g., dams)); last reviewed 30 April 2012 (NatureServe 2014).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Sturgeon Chub are vulnerable and rare throughout its range, and listed as imperiled in South Dakota. The justification for including Sturgeon Chub on the first list of state threatened (16 March 1978) fish is unknown but was presumably due to the construction of the Missouri River impoundments. Surveys in 1989-1990, specifically designed to study Sturgeon Chub believed the species was extirpated as the last recorded Sturgeon Chub was from the Little Missouri River in 1976 (Bich and Scalet 1977; Werdon 1992). Surveys in the mid-late 1990s found Sturgeon Chub at a limited number of sites in the White, Little White, and Cheyenne rivers (Cunningham and Olson 1994; Cunningham et al. 1995; Cunningham and Hickey 1997; Hampton 1998; Cunningham 1999). Based on the presumed limited area of occupancy, separation from other populations, and limited potential for range expansions, Sturgeon Chub are extremely vulnerable to extirpation with limited ability for recolonization and continued listing as state threatened species is recommended.

Description, biology and life history:

The Sturgeon Chub is a slender minnow with small eyes, a brownish-blue back with dark specks and a light underside. The Sturgeon Chub's mouth is inferior with conspicuous barbels at each corner of the mouth and a longitudinal ridge or keel is present on dorsal scales (Schlafke et al. 2024). Sturgeon Chub spawn in June and July with females producing between 2,000 and 5,000 eggs (SDGFP 2006; NGPC 2010). Most individuals live 3 to 4 years (Rahel and Thel 2004). Little is known about the diet of Sturgeon Chub, but it's believed to be a bottom feeder with external taste buds, feeding mainly on invertebrates and sediment material (NGPC 2010).

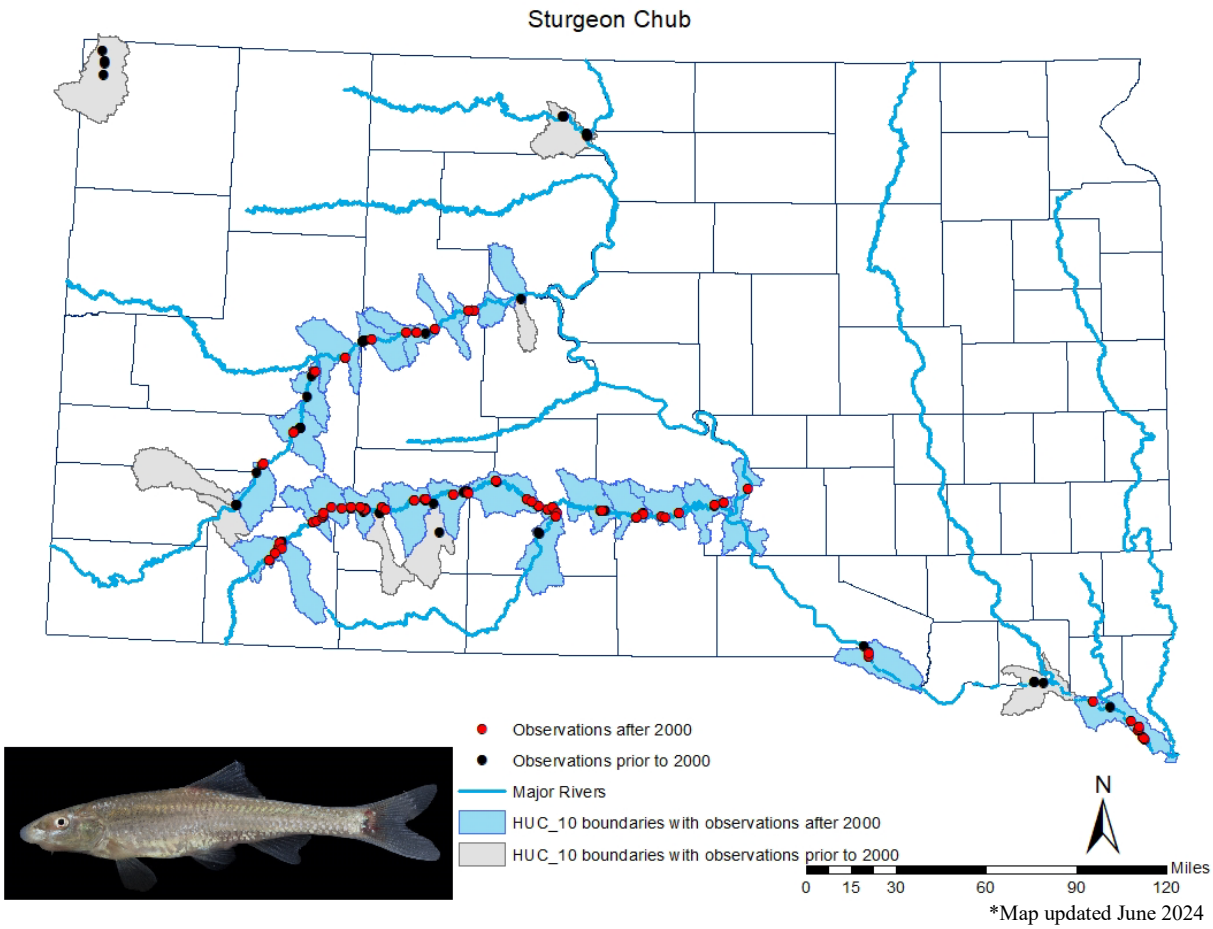
Habitat:

Habitat for the Sturgeon Chub is lotic, as they prefer areas with moderate to strong current on large turbid rivers with rocks, gravel or coarse sand substrates. Also, Sturgeon Chub will

occupy moderate to small tributaries directly connected to larger turbid rivers with extant populations (Pflieger 1975; USFWS 2001; Rahel and Thel 2004).

Distribution within the state:

Sturgeon Chub have been reported at a limited number of sites within the Little Missouri, Grand, Cheyenne, White, and Missouri rivers in South Dakota, which is within the central part of the range (Bailey and Allum 1962; Bich and Scalet 1977; Werdon 1992, 1993; Cunningham and Olson 1994; Cunningham et al. 1995; Cunningham and Hickey 1997; Hampton 1998; Cunningham 1999). Since 2000, Sturgeon Chub have been reported in low relative numbers from the White and Lower Missouri rivers below Fort Randall and Gavins Point dams and a single site from within the Cheyenne River (Heakin, et al. 2002; Cunningham 2014; Schlafke et al. 2024).



*Map updated June 2024

Conservation / Management Considerations:

Sturgeon Chub has been impacted by ecosystem alteration/habitat degradation and ecosystem/habitat conversion loss associated with the development and operation of reservoirs on large rivers. These disrupt water regimes due to a combination of modified flood regimes and sediment transport, channelization, water diversion, fragmentation of once

continuous rivers, and reductions in turbidity. It is suggested that Sturgeon Chub are highly vulnerable to climate change (Rahel and Thel 2004; SDGFP 2014a).

Research and monitoring needs will focus on determining baseline data and status through monitoring efforts, and identifying critical habitats and limiting factors.

Conservation Efforts in South Dakota:

Conservation efforts will focus on increasing partnerships and cooperative arrangements, increasing educational efforts, promoting best management practices that reduce water diversion, maintaining/restoring habitat and stream connectivity, and developing programs to reduce or eliminate the threat of non-native fish competing with Sturgeon Chub (SDGFP 2014a). Additionally, objectives and strategies will follow those outlined within the West River and Missouri River Fisheries Management Plans to standardize survey and sampling protocols to monitor non-game fishes (SDGFP 2014b, 2014c).

State Wildlife Grant Accomplishments:

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9 (2006). Aquatic GAP is a tool for predicting where aquatic species might find suitable habitat. This study's goal was to test the accuracy of aquatic GAP by surveying streams and watersheds with historic occurrences of rare fish species and wetlands with potential habitat for them.
- Classification and mapping of riparian forest along the White River in South Dakota– T-50 (2014). This study classified and mapped the forest and other floodplain vegetation along the White River. Using historical and modern aerial imagery, they were able to describe the changes in river channel dynamics and subsequent vegetation changes over the past 80 years from 1930s to 2010.
- Population structure and habitat use of benthic fishes of the Missouri River and its major tributaries with an emphasis on Sicklefin and Sturgeon Chub in South Dakota- T-89 (2022). Sicklefin and Sturgeon Chub, state listed endangered and threatened respectively, have been petitioned for federal listing and currently are undergoing a 12-month finding. This study will update the distribution and status of this fish assemblage with an emphasis on Sicklefin and Sturgeon Chub, two rare species in South Dakota.

Recovery Criteria/Goals

Given that Sturgeon Chub have limited natural dispersal abilities due to Missouri River mainstem dams, the primary recovery goal for the management of Sturgeon Chub is to maintain existing populations, and protect the habitat within watersheds where Sturgeon Chub are found, especially tributary populations. The specific management goals for Sturgeon Chub are to work with fisheries biologists to standardize seining/otter trawl efforts in coordination with reservoir, Cheyenne River and White River surveys. Additionally, management strategies will involve working with private land and habitat biologists to develop site specific best management practices to ensure habitat protection, while working to maintain existing ecological flow regimes in remaining locations to ensure protection of conservation opportunity areas. Additionally, goals for delisting would include 50% of HUC_10 boundaries previously occupied to maintain current status (Post-2000) and have self-reproducing populations.

Primary Reviewer: Chelsey Pasbrig, Aquatic Biologist

Other Staff or Experts Involved in the Review:

Sam Stukel, Fish and Wildlife Biologist, USFWS, Gavins Point National Fish Hatchery, Yankton

George Cunningham, Fisheries Biologist and Environmental Consultant, Eco~centrics, Omaha, NE

Nathan Loecker, Fisheries Biologist, GFP, Yankton

Eileen Dowd Stukel, Senior Wildlife Biologist, GFP, Pierre

Date Review Completed: June 27, 2024
Date Adopted by GFP Commission: April 6, 2018
Dates of Other Reviews, if appropriate: December 14, 2017, June 12, 2020, June 10, 2022

References:

Bailey, R. M. and M. O. Allum. 1962. Fishes of South Dakota. Misc. Publ., Mus. Of Zoology, Univ. of Michigan, No. 119. 131 pp.

Bertrand, K. et al. In preparation. Fishes of the Dakotas

Bich, J. P. and C. G. Scalet. 1977. Fishes of the Little Missouri River, South Dakota. Proc. SD. Acad. Sci. 56:163-177.

Cunningham, G. 1999. Fish survey of the White River on the U.S. Air Force Badlands Bombing Range, Shannon County, South Dakota.

Cunningham, G. 2014. South Dakota Scientific Collector's Permit. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota

Cunningham, G. and R. Olson. 1994. Fish species collected in streams in West River South Dakota-1994.

Cunningham, G. R., R. D. Olson, and S. M. Hickey. 1995. Fish surveys of the streams and rivers of South Central South Dakota west of the Missouri River. Proc. S.D. Acad. Sci. 74:55-64.

Cunningham, G. and S. Hickey. 1997. Distribution of the Sturgeon Chub in South Dakota. Wildlife Diversity Small Grants Program Project Report. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.

Hampton, D. R. 1998. A survey of the fishes and habitat of the Cheyenne River in South Dakota. M.S. Thesis. South Dakota State University, Brookings, South Dakota.

Heakin, A., N. Morey, and C. Berry Jr. 2002. Environmental monitoring and assessment program activities in South Dakota. Annual Progress Report Submitted to the South Dakota Department of Game, Fish and Parks by the U.S. Geological Survey.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.naturserve.org. (Accessed: October 3, 2014).

Nebraska Game and Parks Commission. 2010. Nebraska's At-Risk Wildlife. Wildlife Division Publication. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Pflieger, W. L. 1975. Fishes of Missouri. Mo. Department. Of Conservation. 343 pp.

Rahel, F.J. and L.A. Thel. 2004. Sturgeon Chub (*Macrhybopsis gelida*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/ projects/scp/assessments/sturgeonchub.pdf [June 5, 2015].

Schlafke, K., M. Wagner, and C. Pasbrig. 2024. Fishes of the Dakotas. Edited by Barnes. M.E. Springer, New York, New York.

South Dakota Department of Game, Fish and Parks. 2006. Fragile Legacy: Rare Animals of South Dakota. Wildlife Division Publication. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014a. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014b. Fisheries and aquatic resources adaptive management system 2014-2018: West River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014c. Fisheries and aquatic resources adaptive management system 2014-2018: Missouri River Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
South Dakota Department of Game, Fish and Parks. 2019. Fisheries and aquatic resources adaptive management system 2019-2023: Northeast Fisheries Management Area Strategic Plan. South Dakota Department of Game, Fish and Parks, Pierre.
U.S. Fish and Wildlife Service. 2001. Updated status review of Sicklefin and Sturgeon Chub. United States Department of the Interior, Region 6, Denver, Colorado.
U.S. Fish and Wildlife Service (USFWS). 2023. Species Status Assessment for the Sturgeon and Sicklefin Chub. USFWS, Pierre, South Dakota. 30 pp.
Werdon, S. J. 1992. Population status and characteristics of *Macrhybopsis gelida*, *Platygobio gracilis*, and *Rhinichthys cataractae* in the Missouri River basin. M.S. Thesis. South Dakota State University, Brookings, South Dakota.
Werdon, S. J. 1993. Status report on sturgeon chub (*Macrhybopsis gelida*), a candidate endangered species. U.S. Fish and Wildlife Service, Ecological Services. North Dakota State Office. Bismarck, ND. 58 pp.

SUMMARY OF UPDATES IN 2020:

As of September 30, 2017, a contract with the Corps to conduct fish community monitoring on the lower Missouri River in South Dakota was not renewed which ended the GFP's 13th year of sampling in Segment 7 of the lower Missouri River (59-mile reach of unchannelized Missouri River between Gavins Point Dam and Ponca, Nebraska). GFP continues its participation as a signatory on the Missouri River Endangered Species Memorandum of Agreement.

In coordination with the West and Missouri River Fisheries Management Area Strategic Plans and fisheries biologists, an effort has been made to standardize nongame sampling across the state to better sample nongame fishes. Currently, workplans for the West and Missouri River Fisheries Management Areas have identified areas throughout the Missouri River reservoirs and its unchannelized reaches to sample for nongame species through the 2023 sampling season which will include Sturgeon Chub habitats.

SUMMARY OF UPDATES IN 2022:

Aquatic strategic planning efforts continue. In 2020, a State Wildlife Grant project began to describe the population structure and habitat use of benthic fishes of the Missouri River and its major tributaries with an emphasis on Sicklefin and Sturgeon Chub in South Dakota. Species ranking using NatureServe in 2022 to assess extinction risk using standard methods updated the species rank for Sturgeon Chub from S2 (imperiled) to S3 (vulnerable). Major categories assessed during species ranking are rarity, threats, and trends.

SUMMARY OF UPDATES IN 2024:

Aquatic strategic planning efforts continue. The project looking to describe the population structure and habitat use of benthic fishes of the Missouri River and its major tributaries was completed December 2022. Sturgeon Chub were captured in the Cheyenne (n = 81), White (n = 331), and Little White (n = 71) rivers but were absent from the Little Missouri and Grand rivers. Relative abundances of Sturgeon Chub of all life stages were highest in the White River. Distributions of all Sturgeon Chubs were limited to lower areas of all rivers where stream width, turbidity, discharge, and observed habitat complexity were highest. Sturgeon Chub were often found in association with high abundances (≥ 10% of catch) of Flathead Chub *Platygobio gracilis* and *Hybognathus* spp. (Plains Minnow *H. placitus* and Western Silvery Minnow *H. argyritis*).

The U.S. Fish and Wildlife Service (the Service) published a not-warranted 12-month finding for the Sturgeon Chub and Sicklefin Chub in the *Federal Register*, September 20, 2023. The Service completed a species status assessment (SSA) report which communicates the results of the comprehensive biological status review. The USFWS determined that the Sturgeon Chub and Sicklefin Chub are not at risk of extinction now or in the foreseeable future. Therefore, the listing is not warranted (USFWS 2023).

The Sturgeon Chub is a small minnow adapted to benthic riverine habitats with a slender streamlined body that inhabits turbid mainstem sections of the Missouri and Mississippi Rivers and some of their tributaries. The species has a widespread distribution and currently occupies 53 percent of its historical range across 12 States (Wyoming, Montana, North Dakota, South Dakota, Nebraska, Kansas, Iowa, Missouri, Illinois, Arkansas, Tennessee, Kentucky).

STATE T&E SPECIES STATUS REVIEW

Species Name: Eastern Hog-nosed Snake, *Heterodon platirhinos*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:08. List of threatened reptiles)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank S1 (critically imperiled; state species rank last updated on 8 June 2020)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- No federal protection
- NatureServe global rank G5 (Demonstrably secure, although it may be rare in some portions of the range); global rank last reviewed 02 Feb 2016

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The Eastern Hog-nosed Snake was listed as state threatened due to its small population size, restricted range and dependence on limited suitable habitat. Continued listing as a state threatened species is recommended.

Description, biology and life history:

Heavy-bodied, medium sized snake (20-33 inches in length) with a slightly upturned snout and paired dark spots on the back of the head. Body color may be yellow, orange, reddish-brown, olive or dark gray. Center and sides of back and tail have irregular dark spots. Scales are keeled and the underside of the tail is lighter colored then the rest of the belly. When threatened, the Eastern Hog-nosed Snake raises its head, hisses, and flattens its neck like a cobra. If this behavior does not deter a predator it will flip over on its back and play dead.

Eastern Hog-nosed Snakes are primarily active during the day. Their diet includes invertebrates, small mammals, frogs, and salamanders; but they often exclusively feed on toads. The upturned snout is thought to be used to burrow after food. They have adaptations to handle the toxins produced by toads and have large rear fangs in the mouths used to puncture inflated toads making them easier to swallow. Potential predators include any medium to large carnivore.

Individuals become sexually mature around two years of age and mate in April or May, shortly after emergence from the hibernacula. Egg laying is often restricted to the warmest months during late June through August. The female lays 15-25 eggs in depressions in sandy soils under rocks or logs. Eggs incubate for approximately 2 months. Females typically only have one clutch per breeding season. During the fall they will return to hibernacula in burrows under rocks.

Habitat:

The Eastern Hog-nosed Snake's general habitat consists of a diverse mosaic of sandy, well-drained soils and open vegetative cover such as open woodlands and prairies in close proximity to water. Individuals avoid completely open areas to decrease risk of predation and will rely on driftwood and other artificial or natural ground cover.

Distribution within the state:

Due to the likely confusion of the Eastern Hog-nosed Snake with the closely resembling Western, or Plains, Hog-nosed Snake (*Heterodon nasicus*), the historical distribution in South Dakota is unclear. Wright and Wright (1957) showed the range extending from the southeastern to the northwestern corners of the state but indicated that they were not sure of this distribution.

Currently, the Eastern Hog-nosed Snake occurs along the Missouri River only in the extreme southeastern corner of South Dakota in Clay, Union and Yankton counties. In 2017, a photo was confirmed of an Eastern Hog-nosed Snake in Todd County from the Rosebud Indian Reservation. This observation likely reflects nearby populations from Cherry County, Nebraska (Davis, personal communication).

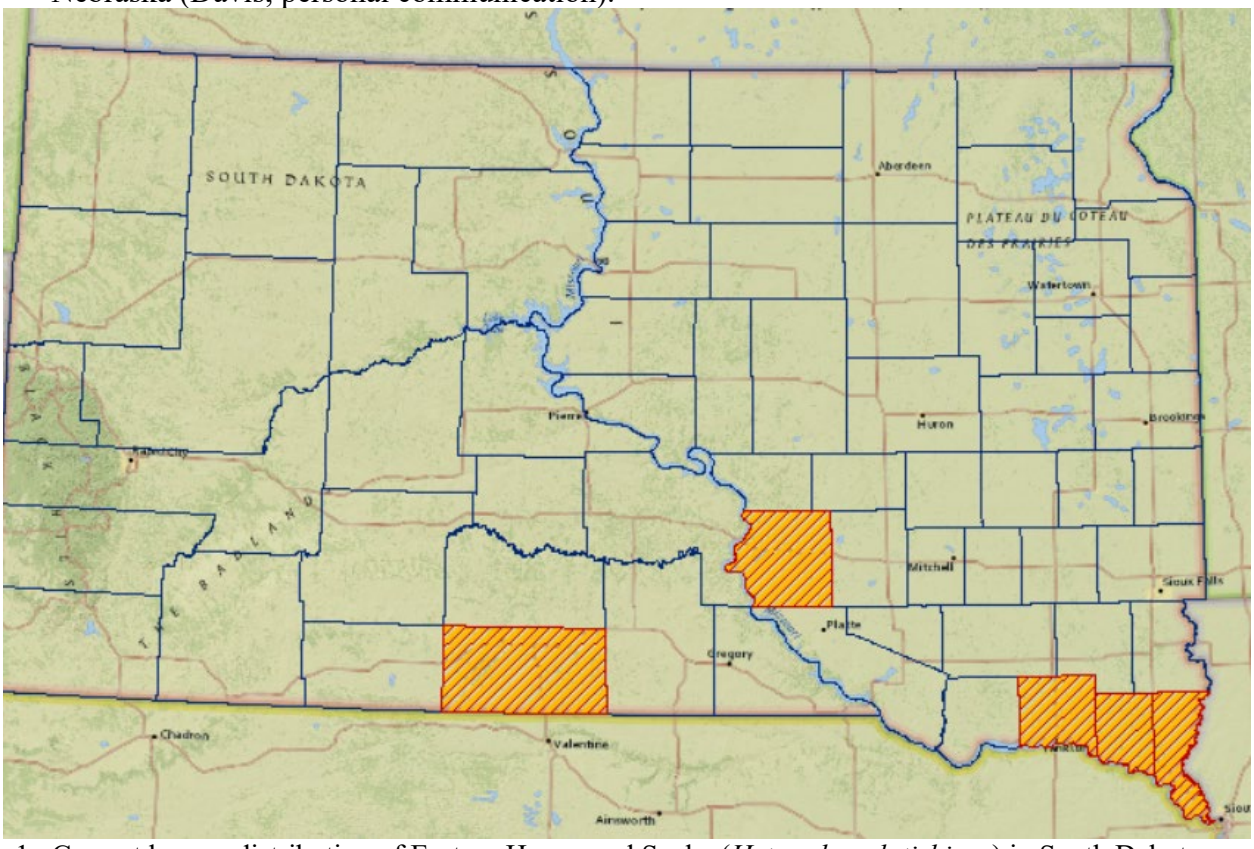


Figure 1. Current known distribution of Eastern Hog-nosed Snake (*Heterodon platirhinos*) in South Dakota.

Conservation / Management Considerations:

Prior to the damming of the Missouri River, frequent flooding events produced sandbars with sparse vegetative growth that is ideal habitat for the Eastern Hog-nosed Snake. These sandbar habitats have rapidly declined due to succession of plants taking place in the absence of floods from the current Missouri Reservoir system. These sandy flood plain habitats are also

popular areas for human use and need to be protected from disturbance. Eastern Hog-nosed Snake habitat has also been altered for agricultural development and recreational uses. The increase in pesticide use in the species range could also be negatively impacting the species, either through direct exposure by runoff, consuming contaminated prey or by reducing prey availability.

Eastern Hog-nosed Snakes are relatively slow moving, making road mortalities a potential threat. Off-road vehicles and mountain bikes also pose a threat to snakes and their nests. The species is also susceptible to human persecution due to its threatening, although harmless, defensive display.

Sand dune habitats near known snake occurrences need to be protected from human disturbance by purchase or easements. Off-road vehicle use should be restricted by fencing and posting. Protecting these habitats will also benefit softshell turtles, False Map Turtles and other species.

Any management plan developed for the Eastern Hog-nosed Snake should address the problem of vegetative encroachment. Public agencies and private landowners should be encouraged to utilize land management practices that promote early plant succession stages where populations of Eastern Hog-nosed Snakes are known to exist. Landowners should also be encouraged to limit or restrict the use of pesticides on their crops. Public awareness and education should be improved to reduce human persecution.

Conservation Efforts in South Dakota:

- State Wildlife Grant Project T-8-R (2004) ten priority habitats were surveyed to collect baseline information on poorly studied reptile and amphibian species.
- State Wildlife Grant Project T-57-R-1 (2012) evaluated a variety of threats to herpetofauna in South Dakota as a component of the South Dakota Wildlife Action Plan revision
- SDGFP published "Field Guide to Amphibians and Reptiles of South Dakota – Second Edition" (Kiesow and Davis 2020). Content was updated by contractor Drew Davis, PhD. Book can be purchased through SDGFP website: https://gfp.sd.gov/pages/gifts/
- Wildlife Diversity Small Grant Project in 2021 conducted targeted surveys for Eastern Hog-nosed Snakes in south-central South Dakota to determine the extent of the species' range. Highlights from this project:
  - Previously, the Eastern Hog-nosed snake was thought to be restricted to extreme southeastern South Dakota along the Missouri River in Clay and Union Counties. However, a recently accessioned museum collection from Chamberlain in 1943 and a verified photograph from Todd county in 2017 indicate that the species range may be greater than expected.
  - Targeted surveys were conducted in south-central South Dakota to better understand the species' abundance and distribution in the state
  - Visual encounter and road surveys were conducted at 14 sites in suitable habitat in Gregory, Lyman and Tripp counties from 13-19 June and 1-7 September.

- No Eastern Hog-nosed Snakes were detected during surveys. However, several localities were identified where the species could be documented in the future based on suitable habitat conditions.

Recovery Criteria/Goals:

Recovery criteria are not proposed at this time because of the need for additional information. Refer to the Recovery Criteria Considerations section for more detail.

Recovery Criteria Considerations:

Surveys and research are needed to gain more information to develop recovery criteria including:

- The complete range of the species in South Dakota and the status and connectivity of the remaining populations within their range. Surveys should also be conducted in potential habitats in Todd, Tripp, Bennett and Gregory counties.
- Current population density and genetic makeup.
- Average home range size and reproductive rates.
- Identify core areas that support habitats for all parts of the species life cycle including; foraging areas, hibernacula, breeding sites and nesting sites in addition to the corridors that link these habitat requirements.
- Determine minimum viable population necessary to maintain the species.
- Identify the timing and locations of peak seasonal movements to help prevent road mortalities.

Primary Reviewer:

Casey Heimerl, Wildlife Biologist, GFP, Pierre

Other Staff or Experts Involved in the Review:

Hugh Quinn, Herpetologist, Rapid City, SD
Drew Davis, PhD, University of South Dakota, Vermillion, SD

Date Review Finalized: 2020; reviewed June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018; approved by GFP Commission on April 5-6, 2018; 2020; and 2022.

References or Information Sources:

Backlund, D. 2004. South Dakota statewide herpetology survey. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, SD.

Ballinger, R.E., J.W. Meeker and M. Theis. 2000. A checklist and distribution maps of the amphibians and reptiles of South Dakota. Transactions of the Nebraska Academy of Sciences 26:29-46.

Buchanan, S.W. 2012. Ecology of the Eastern Hognose Snake (*Heterodon platirhinos*) at Cape Cod National Seashore, Barnstable County, Massachusetts. Thesis. Montclair State University, Montclair, NJ.

Davis, Drew R. 2017. Personal communication – comments to Eastern Hognose Snake status review, PhD Candidate, University of South Dakota, Vermillion, SD.

Davis, Drew R. 2021. Surveys for the state-threatened Eastern Hob-nosed Snake (*Heterodon platirhinos*) in south-central South Dakota. Wildlife Diversity Small Grant final report to South Dakota Game, Fish and Parks, Pierre, SD.

Fogell, D.D. 2003. Amphibian and reptile surveys of southeastern South Dakota with an emphasis on the state-endangered lined snake (*Tropidoclonion lineatum*) May 2002 – June 2003. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, SD.

Jessen, T. 2005. Herpetological survey of eastern South Dakota 2005. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Kiesow, A.M. 2006. Field guide to the reptiles and amphibians of South Dakota. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Kiesow, A.M. and D.R. Davis. 2020. Field guide to amphibians and reptiles of South Dakota – Second Edition. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Kirsch, S.M. 1983. Ecology of the eastern hognose snake (*Heterodon platyrhinos*) in southeastern South Dakota. MA Thesis, University of South Dakota, Vermillion, SD.

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, VA. Available http://explorer.natureserve.org

Over, W. 1923. Amphibians and reptiles of South Dakota. South Dakota Geological and Natural History Survey Series XXIII Bulletin 12:1-34.

Seburn, D. 2009. Recovery strategy for the Eastern Hog-nosed snake (*Heterodon platirhinos*) in Canada. *Species at Risk Act* Recovery Strategy Series. Parks Canada Agency, Ottawa. Vi +24.pp.

Smith, B. and H. Quinn. 2012. Threats to South Dakota amphibians and reptiles. Final report to South Dakota Department of Game, Fish and Parks. Department of Biology, Black Hills State University, Spearfish, South Dakota.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

Wright, A.H. and A.A. Wright 1957. Handbook of snakes of the United States and Canada. Comstock Publishing Associates, a division of Cornell University Press, Ithaca, New York.

SUMMARY OF UPDATES IN 2024:

- None

STATE T&E SPECIES STATUS REVIEW

Species Name: False Map Turtle, *Graptemys pseudogeographica*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:08. List of threatened reptiles)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank of S3 (vulnerable; state species rank last updated on 14 October 2020)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- No federal protection
- NatureServe global rank of G5 (secure, although it may be rare in some portions of the range); global rank last reviewed 2 May 2005

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

The False Map Turtle was listed as state threatened due its limited and localized populations when it once was reported as the most common turtle in the Missouri River. Continued listing as a state threatened species is recommended at this time.

Description, biology and life history:

The False Map Turtle has an olive to brown carapace with knobs running down the center of the back and a saw-tooth edge along the rear border. The female's carapace is 9-10 inches long and the male's is 4-6 inches long. Underside is yellow with dark lines around the edges. The neck has yellow stripes with a yellow "L" shaped spot behind each eye.

False Map Turtles breed in the spring and females will lay up to 16 eggs in early June to July. Eggs hatch after two to three months of incubation. Dixon (2009) found the length of the nesting season was 36 days along the lower stretch of the Missouri National Recreational River (MNRR). Sex of the offspring is dependent on temperature, and vegetation near nest sites can cause lower temperatures that alter sex ratios (Ewert and Nelson 1991). False Map Turtles in the northern portion of their range are capable of producing two clutches per nesting season (Ernst et al. 1994). Sexual maturity for males is reached between 4-6 years of age and around 8 years for females. Turtles are generally long-lived and have high fecundity rates, however survivorship from hatching through the first year of life is low (Ernst et al. 1994). Gregor (2012) found that juvenile females had the longest average linear home ranges of 9.2 miles. Linear home ranges of adult females averaged 4.3 miles and all males averaged 5.8 miles.

False Map Turtles consume aquatic invertebrates, fish, and aquatic vegetation. Predators include mink (*Neovison vison*), coyotes (*Canis latrans*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), opossums (*Didelphis virginiana*) and raccoons (*Procyon lotor*). Dixon (2009) did not find depredation to be a major factor of nest mortality in most areas,

but when it occurred it was concentrated at isolated patches of preferred nesting habitat where turtles were nesting in high densities due to a lark of alternate sites. Higher predation rates also occurred on natural versus human-made sandbars.

Habitat:

Rivers, reservoirs, lakes and ponds with a muddy substrate, basking sites, and some aquatic vegetation. Primarily associated with the Missouri River in South Dakota. Uses sparsely vegetated sand bars and beaches for nesting. Gregor (2012) found the highest capture rates of False Map Turtles using hoop traps that were placed in areas where tributaries entered the Missouri River and in fyke nets located in backwater habitats.

Overwinter in mud or in muskrat dens in areas with flowing water that provides suitable dissolved oxygen levels. Declines in water levels during the winter can be a source of morality by causing ice shelves to collapse and trap animals along the shoreline (Gregor 2012).

Distribution within the state:

The False Map Turtle was once reported to be the most common turtle of the Missouri River in South Dakota (Timken 1968). Currently, it occurs in the Missouri River and backwaters as well as a few mouths of tributaries in southeastern South Dakota where it is considered rare to locally common. It has also been found on the James River upstream from the confluence with the Missouri River (Gregor 2012). It is most common below Gavins Point Dam and Fort Randal Dam. False Map Turtles have been reported as being regularly seen in the Niobrara Delta area (Chris Longhenry, GFP biologist, personal communication). Gregor (2012) reported the False Map Turtle to be the dominant species in all habitats sampled within the 59-mile segment of the Missouri National Recreational River. False Map Turtles have been observed below Big Bend Dam and in the Pierre area around Farm Island and Laframboise Island, however their current distribution and status above Fort Randal Dam is more uncertain.

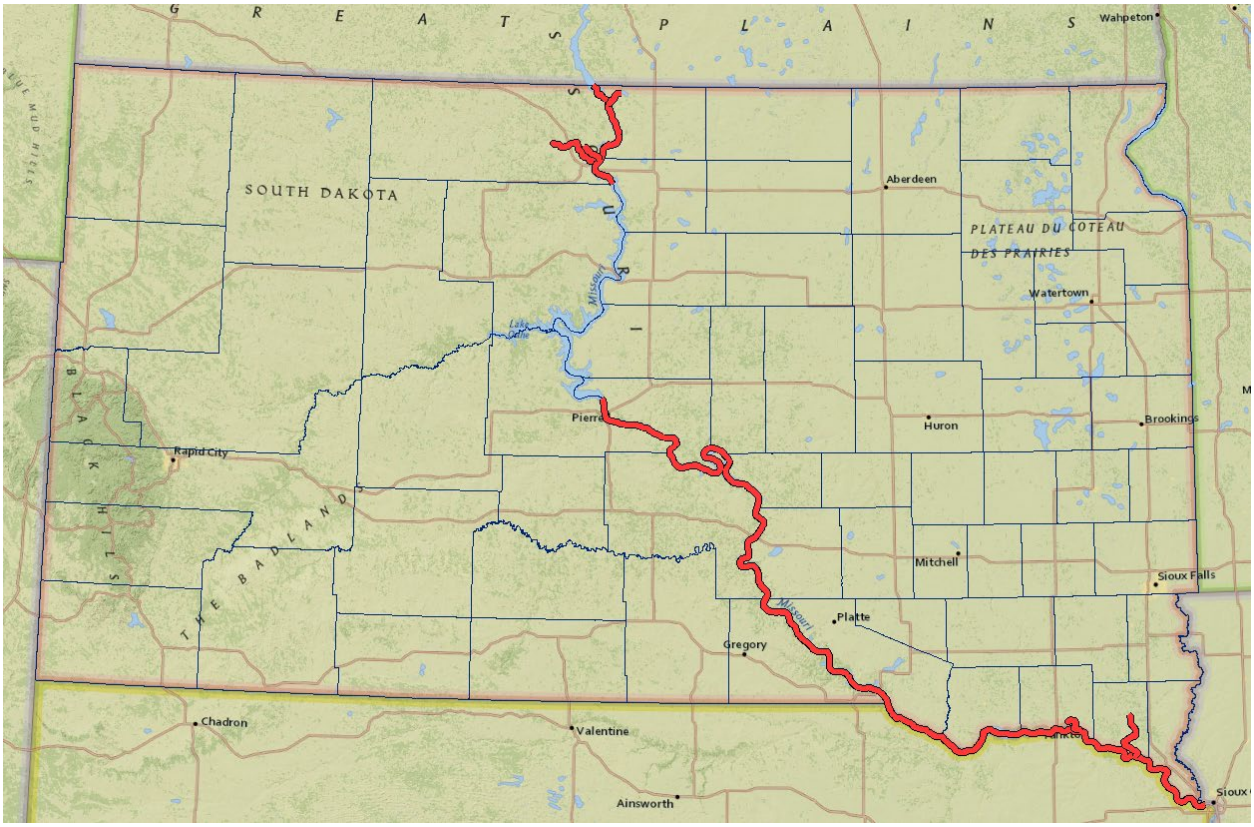


Figure 1. Current known distribution of False Map Turtle (*Graptemys pseudogeographica*) in South Dakota.

Conservation / Management Considerations:

Populations of False Map Turtles have been declining due to water pollution, river channelization and loss of nesting habitat. Sandbars and beaches which are important nesting habitats have been disappearing since the construction of dams on the Missouri River and the near elimination of downstream flooding events. Without the disturbance associated with flooding events the remaining sandbars and beaches are progressing from being sparely vegetated, which is ideal for nesting turtles, to mature forests with an invasive understory of plants (Smith and Quinn 2012).

Bank stabilizations such as rip-rap placement also limit nest site availability and the input of large woody debris that False Map Turtles use for basking, cover and foraging. The decline of nesting habitat has resulted in False Map Turtles concentrating nesting on the few remaining beaches which can result in increased nest depredation rates. Boat collisions are also a hazard for False Map Turtle populations in areas that receive heavy boat traffic. This problem can be exacerbated in early spring and late fall when the turtles are active but slower moving due to low water temperatures (Gregor 2012).

Public agencies and private landowners should be encouraged to utilize land management practices that promote early plant succession stages where populations of False Map Turtles are known to exist. Allowing controlled flooding events to occur would also promote the natural formation of sandbars and beaches. Alternatively, human-made sandbars have also

been found to be used by False Map Turtles for nesting habitat. Bank stabilization projects that utilize riprap should be discouraged in areas of known False Map Turtle populations. Areas of high nesting concentrations should be protected from predators and human disturbances. There is also a need to investigate if False Map Turtle bycatch in fish traps is a considerable threat to the species and if trap modifications need to be made to reduce loss. Requiring those who use fish traps to report bycatch would be one approach to the issue.

The False Map Turtle is also a popular species in the pet trade. South Dakota's turtles are now legally protected from commercial trade; however the species needs to still be monitored to make sure it is not being illegally taken.

Recovery efforts should focus on maintaining and expanding the range of False Map Turtle populations. To implement these goals there is a need to:

- Continue surveying and monitoring the species distribution and population.
- Identify and protect important nesting beaches and sandbars and overwintering sites from predators and human caused mortalities and disturbances.
- Ensure regulations will protect from take if removed from state threatened list.

Conservation Efforts in South Dakota:

- State Wildlife Grant Project T-8-R (2004) surveyed ten priority habitats to collect baseline information on poorly studied reptile and amphibian species.
- State Wildlife Grant Project T-20-R (2009) surveyed waterways in southeastern South Dakota to address a lack of information on annual populations changes, nest locations, and breeding success for the False Map, Smooth and Spiny Softshell turtles.
- State Wildlife Grant Project T-30-R (not competed) determined habitat associates and requirements determined turtle abundance and age structure, and documented turtle movement patterns.
- State Wildlife Grant Project T-57-R-1 (2012) evaluated a variety of threats to herpetofauna in South Dakota as a component of the South Dakota Wildlife Action Plan revision
- State Wildlife Grant Project T-77-R-1 conducted surveys for False Map Turtles and identifying key nesting sites in the Lake Oahe reservoir, an area where there is limited information on the species.
- SDGFP published "Field Guide to Amphibians and Reptiles of South Dakota – Second Edition" (Kiesow and Davis 2020). Content was updated by contractor Drew Davis, PhD. Book can be purchased through SDGFP website: https://gfp.sd.gov/pages/gifts/

Researchers who conducted SWG Project T-77 did not detect any False Map Turtles along Lake Oahe during 3 years of study (2017 – 2019). SDGFP Wildlife Diversity Biologist and Herpetologist Jen Buchanan reported the following results from her visual surveys during the summer of 2023:

- Surveyed from Ft. Thompson up to Okobojo Point State Recreation Area
  - Both sides of river, public access areas
  - 58 locations, ~85 miles
- New occurrence and new county record for Lyman County

- 8 total locations of False Maps
  - 83 total
  - 40 females
  - 43 males
  - Majority of them at Oahe Downstream Rec Area (n=67)

Jen is no longer with SDGFP, but these results indicate that continued surveys may yield additional positive results in this portion of the species' range.

Recovery Criteria/Goals

- Criteria for Lake Sharpe, Lake Francis Case, and Lewis and Clark Lake and associated tributaries
  - Evidence of at least 250 adult females in a breeding season
  - Evidence of successful reproduction resulting in a stable or increasing population over a 10 year period
- Results from survey conducted on Lake Oahe in 2017 and 2018 (SWG Project T-77-R-1) suggest that False Map turtles are not as common as in other Missouri River reservoirs. Further research is needed to develop delisting criteria for this reservoir.
- Have an established, continued plan of periodic monitoring of population trends and habitat after delisting.
- Ensure that collection and bycatch are no longer threats to survival.

Primary Reviewer:
Casey Heimerl, Wildlife Biologist, SD Department of Game, Fish and Parks, Pierre, SD.

Other Staff or Experts Involved in the Review:
Aaron Gregor –PhD Candidate, University of South Dakota, Vermillion, SD
Hugh Quinn, Herpetologist, Rapid City, SD
Drew Davis – PhD, University of South Dakota, Vermillion, SD

Date Updated Review Finalized: June 2024 (Jen Buchanan and Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018; approved by GFP Commission on April 5-6, 2018; 2020; and 2022.

References or Information Sources:

Backlund, D. 2004. South Dakota Statewide Herpetology Survey. South Dakota Department of Game, Fish and Parks, Pierre, SD.

Bury, T.B. 2011. Modifications of traps to reduce bycatch of freshwater turtles. Journal of Wildlife Management 75:3-5.

Dixon, L.A. 2009. False map, spiny softshell and smooth softshell turtle nest and nest-site habitat characteristics along the lower stretch of the Missouri National Recreation River in South Dakota. M.S. Thesis, South Dakota State University, Brookings.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Candida. Smithsonian Institution Press, Washington, D.C., 682 pp.

Ewert, M.A. and C.E. Nelson. 1991. Sex determination in turtles: Diverse patterns and possible adaptive values. Copeia 1991:50-69.
Gregor, A. 2012. Abundance, habitat relationships, and movement patterns of turtles in southeastern South Dakota. Final Report to GFP, Pierre, SD.
Johnston, W.C., M.D. Dixon, M.L Scott, L. Rabbe, G. Larson, M. Volke, and G. Werner. 2012. Forty years of vegetation change on the Missouri River floodplain. BioScience 62(2):123-135.
Kase, A. 2019. Surveys for false map turtles and identification of key nesting sites in the upper Missouri River of South Dakota. Final Report to GFP, Pierre, SD.
Kiesow, A.M. 2006. Field guide to amphibians and reptiles of South Dakota. South Dakota Dept. of Game Fish and Parks, Pierre, SD.
Kiesow, A.M. and D.R. Davis. 2020. Field guide to amphibians and reptiles of South Dakota – Second Edition. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.
Larocque, S.M., S.J. Cooke, and G. Blouin-Demers. 2012. Mitigating bycatch of freshwater turtles in passively fished fyke nests through the use of exclusion and escape modifications. Fisheries Research 125-126:149-155.
Merchand, M.N. and J.A. Litvaitis. 2004. Effects of landscape composition, habitat features and nest disturbance on predation rates of simulated turtle nests. Biological Conservation 117:243-251.
NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, VA. Available http://explorer.natureserve.org
Smith, B. and H. Quinn. 2012. Threats to South Dakota amphibians and reptiles. Final report to South Dakota Department of Game, Fish and Parks. Department of Biology, Black Hills State University, Spearfish, South Dakota.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
Timken, R.L. 1968. The distribution and ecology of turtles in South Dakota. Ph.D. dissertation. Department of Zoology, University of South Dakota, Vermillion, South Dakota.

SUMMARY OF UPDATES IN 2024:

- Survey results from Jen Buchanan, SDGFP Regional Wildlife Diversity Biologist, added to the text reflecting results of visual surveys conducted at certain sites along Lake Sharpe and Lake Oahe during the summer of 2023.

STATE T&E SPECIES STATUS REVIEW

Species Name: Lined Snake, *Tropidoclonion lineatum*

South Dakota Status, including legal status and special listings:

- State Endangered (SD Administrative Rule 41:10:02:07. List of endangered reptiles)
- Monitored by the South Dakota Natural Heritage Program
- State Heritage rank S2 (imperiled; state species rank last reviewed on 19 April 2020)
- Included as a Species of Greatest Conservation Need in South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- No federal protection
- NatureServe global rank of G5 (Demonstrably secure, although it may be rare in some portions of the range); global rank last reviewed 07 Sep 2006

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Status change in 1996 from state threatened to state endangered and the current recommendations is to continue listing with this status. The species currently has a secure global rank but is considered critically imperiled in South Dakota due to continued habitat loss and alteration to urban and agricultural development.

Description, biology and life history:

Small snake (9-15 inches), gray/brown in color with 3 light-colored stripes running the length of its body with the central stripe being the most distinctive. The stripes are bordered by black dots that are more noticeable on juveniles. The Lined Snake can be distinguished from similar looking garter snake species (*Thamnophis* spp.*)* by double row of black half-moon shaped dots along the belly.

The Lined Snake is most active from April to October, and activity appears to increase after periods of rain. Individuals are solitary, but can be found in groups in overwintering dens and when males are seeking females during the breeding season. Individuals mate in the fall with egg fertilization delayed until the following spring. Female gives birth to 6-7 live young during mid-August.

The Lined Snake's diet consists of invertebrates, primarily earthworms. They forage at night and during rainstorms when earthworms are active or near the soil surface. Predators of the Lined Snake include a variety of carnivorous mammals and birds.

Habitat:

Found in open grasslands and sparsely wooded areas preferring moist habitat near springs, ponds, marshes, streams and rivers. Also found in urban areas such as city lots, parks, cemeteries and gardens. Active at night and typically shelters beneath rocks and logs during the day. Overwinters in underground burrows.

Distribution within the state

Over (1923) and Wright and Wright (1957) reported the distribution was restricted to the southeast corner of South Dakota along the Big Sioux River corridor where it still occurs today but in populations diminished in size and number.

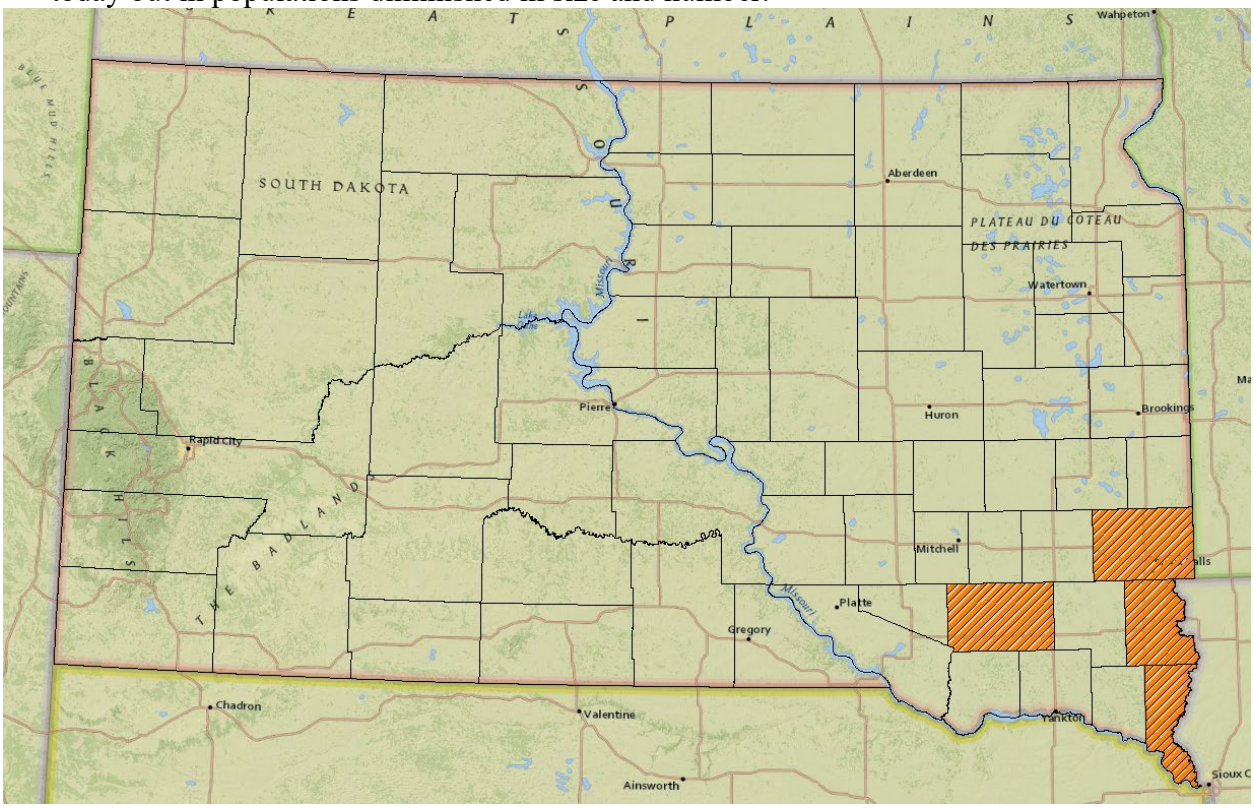


Figure 1. Current known distribution of Lined Snake (*Tropidoclonion lineatum*) in South Dakota.

Conservation / Management Considerations:

In addition to natural habitats, Lined Snakes are also found in urban settings making wetland drainage, agricultural development, pesticide use, and road mortalities some of the main threats to the species. Continued survey work is needed to identify population locations and to locate potential areas of high road mortalities.

There is a need to continue to conduct survey and monitoring work o document populations and potential road crossing hazards. In areas where hazards are identified, drift fences and road crossing culverts should be established to mitigate loss. Current documented populations should be protected by working with landowners to establish buffer zones around agricultural fields where Lined Snakes are known to occur, particularly in roadside ditches.

Conservation Efforts in South Dakota:

- In 2002-2003, Daniel Fogell conducted surveys on state owned lands to document herpetofauna, with a focus on the Lined Snake.
- State Wildlife Grant Project T-8-R (2004) ten priority habitats were surveyed to collect baseline information on poorly studied reptile and amphibian species.

- A Wildlife Diversity Small Grant was awarded to Drew Davis, PhD, in 2022 for the following project: "Characterizing the genetic makeup of Lined Snakes (*Tropidoclonion lineatum*) in South Dakota" with the following objectives:
  Objective 1—To characterize genetic differences between the Big Sioux River and James River populations of Lined Snakes.
  Objective 2—To characterize genetic differences of Lined Snakes in South Dakota with those from nearby states in the Great Plains.

  SDGFP received an interim report on this project, which has had to be extended due to lab constraints. The interim report described tissue acquisition from samples in South Dakota, Oklahoma, Texas, Nebraska, Kansas, Iowa, Colorado, New Mexico, and Minnesota and preparations for lab analyses.

- State Wildlife Grant Project T-57-R-1 (2012) evaluated a variety of threats to herpetofauna in South Dakota as a component of the South Dakota Wildlife Action Plan revision.
- 2018 Wildlife Diversity Small Grant Project – "Surveys for the state-endangered lined snake (*Tropidoclonion lineatum*) along the lower James River Valley
  - A series of targeted surveys for Lined Snakes were conducted along the lower James River valley from 25 April – 4 May and 28 September – 5 October 2018 to better understand the distribution and occurrence of Lined Snakes in southeastern South Dakota.
  - A total of 16 Lined Snakes were detected from 14 individual locations in Hutchinson County, which only had one documented record prior to this survey effort.
  - Initial data suggest that this is a reproducing population and that road mortality may be a significant threat to individuals.
  - Attempts to locate individuals in other regions along the James River were unsuccessful.
- SDGFP published "Field Guide to Amphibians and Reptiles of South Dakota – Second Edition" (Kiesow and Davis 2020). Content was updated by contractor Drew Davis, PhD. Book can be purchased through SDGFP website: https://gfp.sd.gov/pages/gifts/

Recovery Criteria/Goals:

Recovery criteria are not proposed at this time because of the need for additional information. Refer to the Recovery Criteria Considerations section for more detail.

Recovery Criteria Considerations:

Surveys and research are needed to gain more information to develop recovery criteria including:

- The complete range of the species in South Dakota and the status and connectivity of the remaining populations within their range. Efforts should be targeted to understand the occurrence of the species within the James River corridor and between the James River and Big Sioux River corridors.
- Current population density and genetic makeup.
- Average home range size and reproductive rates.

- Identification of core areas that support habitats for all parts of the species life cycle including foraging areas, hibernacula, breeding sites and nesting sites in addition to the corridors that link these habitat requirements.
- Determine minimum viable population necessary to maintain the species.
- Identifying the timing and locations of peak seasonal movements to help prevent road mortalities.

Primary Reviewer:
Casey Heimerl, Wildlife Biologist, GFP, Pierre

Other Staff or Experts Involved in the Review:
Hugh Quinn, Herpetologist, Rapid City, SD
Drew Davis, PhD, University of South Dakota

Date Review Finalized: 2020; updated in June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate: 2018; approved by GFP Commission on April 5-6, 2018; 2020; and 2022.

References or Information Sources:

Backlund, D. 2004. South Dakota statewide herpetology survey 2004. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Ballinger, R.E., J.W. Meeker, and M. Thies. 2000. A checklist and distribution maps of the amphibians and reptiles of South Dakota. Transactions of the Nebraska Academy of Sciences 26:29-46.

Collins, J.T. 1993. Amphibians and reptiles in Kansas. Third edition. The University of Kansas, Museum of Natural History, Lawrence, Kansas.

Davis, D.R. 2018. Surveys for the state-endangered lined snake (*Tropidoclonion lineatum*) along the lower James River Valley. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, SD.

Fogell, D.D. 2003. Amphibian and reptile surveys of southeastern South Dakota with an emphasis on the state-endangered lined snake (*Tropidoclonion lineatum*) May 2002 – June 2003. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, SD.

Jessen, T. 2003. A survey of the herpetofauna of the Big Sioux River Valley. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Jessen, T. 2005. Herpetological survey of eastern South Dakota 2005. Final report to the South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Kiesow, A.M. 2006. Field guide to amphibians and reptiles of South Dakota. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

Kiesow, A.M. and D.R. Davis. 2020. Field guide to amphibians and reptiles of South Dakota – Second Edition. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, VA. Available http://explorer.natureserve.org

Oldfield, B., and J.J. Moriarty. 1994. Amphibians and reptiles native to Minnesota. University of Minnesota Press, Minneapolis, MN.

Over, W. 1923. Amphibians and reptiles of South Dakota. South Dakota Geological and Natural History Survey Series XXIII Bulletin 12:1-34.
Smith, B. and H. Quinn. 2012. Threats to South Dakota amphibians and reptiles. Final report to South Dakota Department of Game, Fish and Parks. Department of Biology, Black Hills State University, Spearfish, South Dakota.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
Wright, A.H. and A.A. Wright 1957. Handbook of snakes of the United States and Canada. Comstock Publishing Associates, a division of Cornell University Press, Ithaca, New York.

SUMMARY OF UPDATES IN 2024:

- Included highlights from Wildlife Diversity Small Grant project regarding genetic makeup of this species. Highlights are from an interim report, with final report expected in the future. The contract was extended due to lab processing issues.

STATE T&E SPECIES STATUS REVIEW

Species Name: Black-footed Ferret, *Mustela nigripes*

South Dakota Status, including legal status and special listings:

- State endangered (SD Administrative Rule 41:10:02:03, List of endangered mammals)
- Monitored by South Dakota Natural Heritage Program
- State Heritage Rank S1 (critically imperiled species)
- Included as a Species of Greatest Conservation Need in the South Dakota Wildlife Action Plan (SDGFP 2014)

Federal Status:

- NatureServe global rank G1 (critically imperiled species); last reviewed 4 April 2016
- Federal endangered. This species was listed as endangered in 1967 pursuant to precursor legislation to the Endangered Species Act (ESA) of 1973. Second revision of the recovery plan was published in 2013 (U.S. Fish and Wildlife Service 2013).

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Specific justification for including the black-footed ferret on the list of state endangered mammals is unknown but was presumably intended to mirror its federal status. In the event that this species is down listed or delisted by the U.S. Fish and Wildlife Service (USFWS), we will reevaluate whether continued listing as a state endangered species is warranted.

Description, biology and life history:

The black-footed ferret is a mink-like mammal that is 20-24 inches long and weighs from 1.5 to 2.5 lbs. As indicated by its common name, feet and legs are black. It also has a black face mask and black-tipped tail. Upper body parts are yellowish buff.

Black-footed ferrets are solitary except during breeding. Breeding begins at approximately one year of age in March through early April. Gestation is approximately 42 days with an average litter of 3.5 kits born in an underground burrow and cared for exclusively by the female. Kits appear above ground in July and are ready to disperse in September or October. Young of the year may stay in the mother's home range; males disperse farther than females.

This nocturnal predator is extremely specialized relying almost exclusively on prairie dogs for both food and shelter. Hunting occurs underground. Prey is cached and one prairie dog is consumed every three to four days. Little information exists on life expectancy, but individuals have been known to live up to five years in the wild.

Habitat:

Black-footed ferrets need prairie dogs for food and their burrows for shelter.

Distribution within the state:

Historical black-footed ferret distribution in South Dakota corresponds with black-tailed prairie dog (*Cynomys ludovicianus*) distribution which includes most of western South Dakota and those areas in eastern South Dakota that had burrowing rodents, especially black-tailed prairie dogs. Current distribution reflects original reintroduction areas (Figure 1).

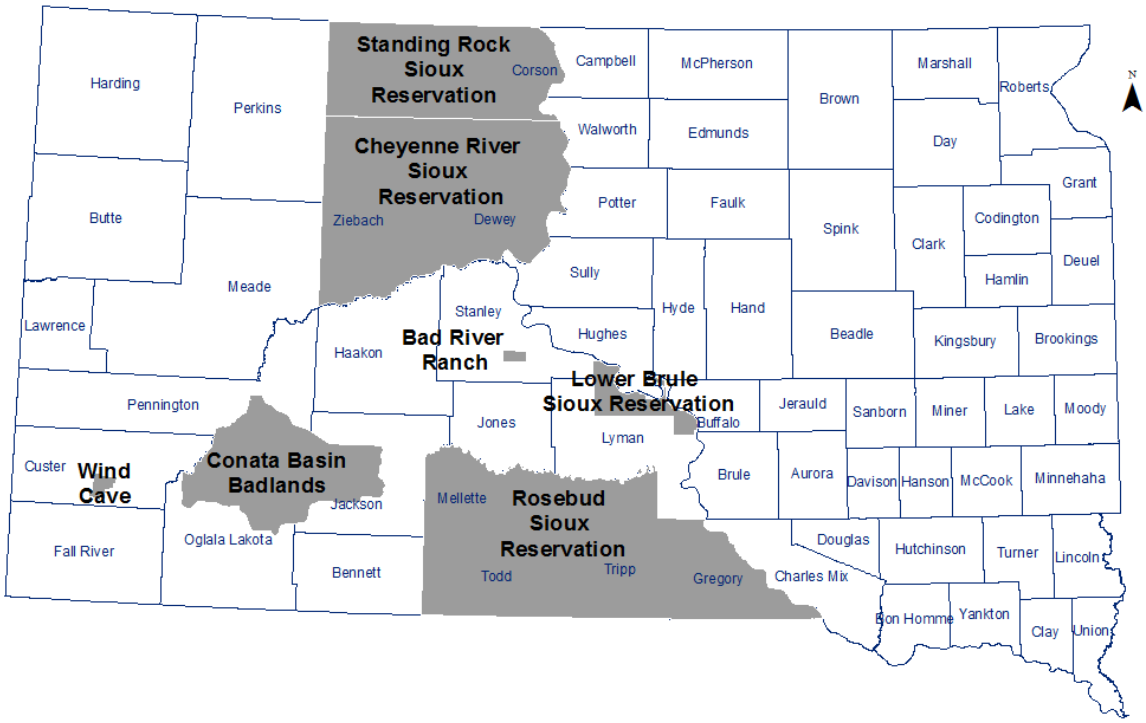


Figure 1. Black-footed ferret reintroduction areas in South Dakota.

Conservation / Management Considerations:

Historically, the close association of black-footed ferrets with prairie dogs has also been the primary reason for its decline. Up until the 1960's, the number of prairie dog colony acres and prairie dogs was in steep decline. This decrease was due to the conversion of black-footed ferret habitat to cropland, prairie dog poisoning campaigns and disease in both prairie dogs and ferrets. Some of those same conservation challenges remain today. Current threats to black-footed ferret recovery include prairie dog (maintaining colony acres of sufficient size and juxtaposition) and disease management (e.g. sylvatic plague). A minimum of approximately 1,500 acres of occupied black-tailed prairie dog habitat is required to support a population of 30 adult black-footed ferrets. Natural predation (coyote, fox, badger, great horned owl and golden eagle) also poses challenges for black-footed ferret recovery. Future research should focus on understanding sylvatic plague ecology, improving sylvatic plague mitigation methods (e.g. vaccination and insecticide application), improving reintroduction methods (e.g. captive rearing, captive release, and translocation of wild animals) as well as determining the influence of predators and prey on black-footed ferret populations. The

distribution and prevalence of sylvatic plague should be monitored. Incentive programs for landowners who manage for habitat should be developed. Site specific management actions may include the development of predator control programs, where appropriate.

Conservation Efforts in South Dakota:

Past

The last known stronghold of ferrets in South Dakota occurred in Mellette County. After the discovery of this population in 1964, extensive research was conducted before the last individual in this population was observed in 1974. The species was thought extinct in South Dakota and throughout its range until another population was discovered in Wyoming in 1981.

The first recovery plan was drafted in 1978 and a second plan was finalized in 1988. The most recent recovery plan was published in 2013 (U.S. Fish and Wildlife Service 2013). The USFWS conducts Species Status Assessments (SSA) to determine the current and future status of listed species and assess their viability into the future. The SSA completed for the black-footed ferret in 2019 predicted that sylvatic plague and limited habitat will continue to effect species viability and unless management actions are intensified, viability will likely decline under all scenarios and timeframes analyzed. This SSA was used to inform the most recent 5-year review of the black-footed ferret completed in 2020. Five-year reviews are conducted by the USFWS to determine if the status of listed species should be changed or removed from the federal list. No change in species status was recommended.

Since 1996, South Dakota Department of Game, Fish and Parks (SDGFP) has been a part of the Black-footed Ferret Recovery Implementation Team (BFFRIT). The team was created under the authority of the ESA to help implement recovery plans and work towards recovery by integrating the expertise and resources of various partners. Similar, the South Dakota Recovery Implementation Team shares relevant information and resources for the recovery and conservation of the black-footed ferret in the state. GFP is also a member of this team.

According to blackfootedferret.org (https://www.blackfootedferret.org/reintroduction-efforts.html), there have been 34 reintroduction sites in North America, including 8 reintroduction projects in South Dakota:

1. Badlands National Park, Pennington County (1994).
2. Buffalo Gap National Grassland, Pennington County (1996). This and the Badlands National Park site are collectively referred to as Conata Basin/Badlands. At least 140 individuals were detected as of November 2021.
3. Cheyenne River Sioux Tribe (CRST), Dewey County (2000). It is currently unknown how many individuals are at this site.
4. Rosebud Sioux Tribe, Todd County (2003). It is unknown how many individuals remain at this site. However, two vehicle-killed individuals were reported in 2021.

5. Lower Brule Sioux Tribe, Lyman County (2006). Twenty-one individuals were observed in early 2022.
6. Wind Cave National Park, Custer County (2007). At least 28 individuals were known to be at this site in the fall of 2021.
7. Bad River Ranch, Stanley County (2017). Site impacted by plague one year after reintroduction. No individuals know to be at this site.
8. Standing Rock Sioux Tribe, Corson County (2021). Twenty-eight captive reared individuals were released in October.

The reintroductions on Badlands National Park and Buffalo Gap National Grassland have since merged into one population (Conata Basin/Badlands). Before the outbreak of plague in the Conata Basin in 2008, this population was considered to be the most successful reintroduction site in the United States. Wild-born ferrets from this site were translocated to other reintroduction sites to augment other populations. Black-footed ferret reintroduction on the Cheyenne River Sioux Reservation was also considered successful, producing approximately 600 kits since the first release of ferrets there in 2000. By 2006, the CRST translocated ferrets for reintroduction of the Lower Brule Sioux Tribe and Rosebud Sioux Tribe reservations. However by 2016, prairie dog colonies only occupied an estimated 10% of the 2000 acreage and ferrets were no longer found. Black-footed ferrets have intermittently been documented in Corson County. The most recent report was that of a roadkill in November 2012. Genetic testing strongly suggested this individual originated from the reintroduced population on Cheyenne River Sioux Reservation. In October 2021, 28 captive-reared ferrets were reintroduced onto tribal lands of the Standing Rock Sioux Tribe in Corson County, SD. This is the eighth reintroduction in South Dakota.

Soon after the reintroduction of black-footed ferrets in Wind Cave National Park, black-footed ferrets were sighted annually in Custer State Park. The USFS, National Park Service, USFWS, Cheyenne River, Rosebud and Lower Brule Sioux tribes monitor the success of reintroductions in South Dakota. Results are shared annually with GFP through the BFFRIT. Black-footed ferrets are highly susceptible to plague, and mortality rates are high for black-tailed prairie dogs. The first documented active outbreak (epizootic) in black-tailed prairie dogs in South Dakota occurred in 2005 in Oglala Lakota County. Based on available information (plague positive animals, flea samples or confirmed reports of prairie dog die-offs), plague has a likely distribution across much of western South Dakota (Figure 2). This does not mean that an epizootic is or has occurred in these areas, but that the bacterium *Yersinia pestis* that causes plague is known to be present. GFP collects and tests samples for plague if a landowner reports a possible colony die-off or if reports of colony die-offs come from areas that are not currently known to have plague.

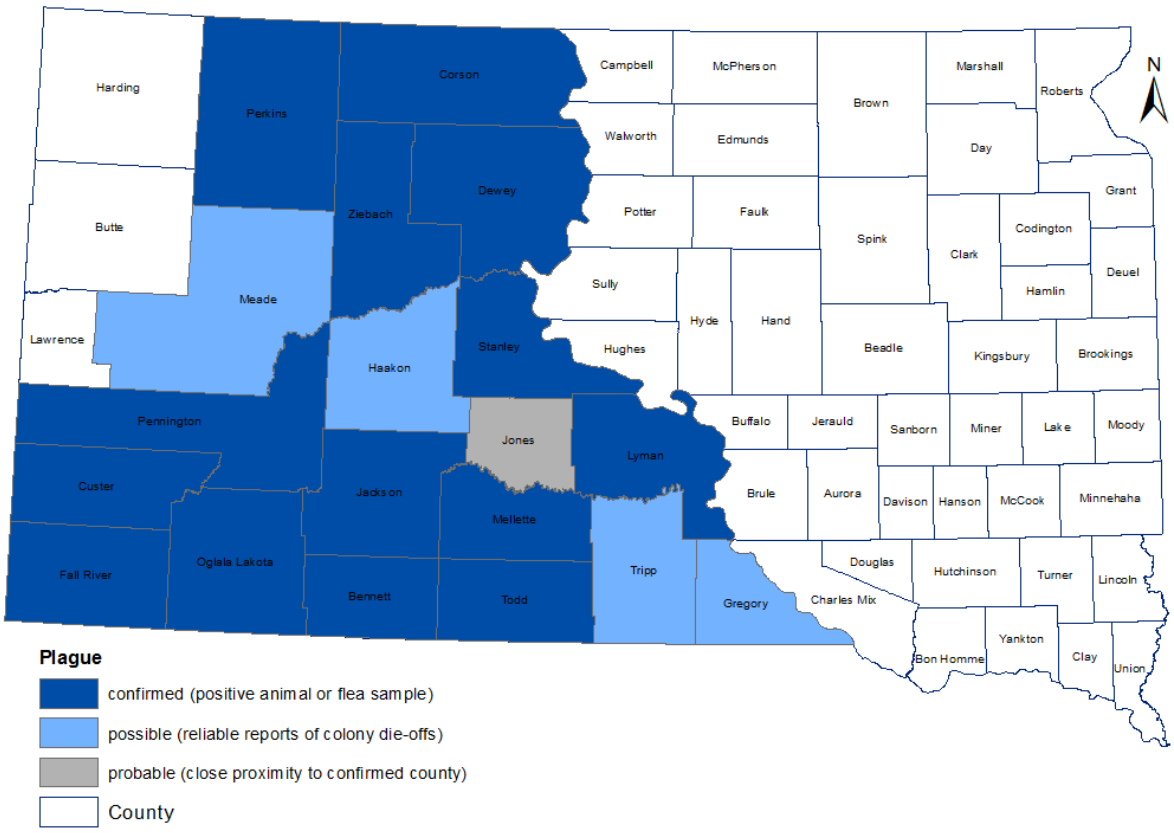


Figure 2. Known and predicted distribution of plague (*Yersinia pestis*) in South Dakota as of 2020.

A landowner incentive program was developed in May of 2006 using a Cooperative Endangered Species Grant from the USFWS. Money from this match-grant (25% state funds: 75% federal funds) was used to provide monetary incentives to private landowners to maintain black-tailed prairie dog colonies in areas occupied by black-footed ferrets. This incentive program was targeted towards private landowners within the Conata Basin/Badlands black-footed ferret reintroduction area (Figure 1). A total of $317, 787 was allocated for use during a five-year period. Willing landowners agreed to a minimum $12.20 per acre annual payment in exchange for their cooperation in carrying out actions to improve, enhance, or maintain black-footed ferret habitat (at a minimum no shooting or poisoning prairie dogs). This minimum payment reflected the 3-year average pastureland rental rates of the counties involved. Over time, the payment per acre changed to reflect changes in average pastureland rental rates and the conservation value of properties enrolled. Over $35,000 in payments were made to two landowners.

Given the changing environmental conditions, the presence of plague in the reintroduction area, limited interest in the program and the amount of remaining funds, we extended the scope of the grant to cover other black-footed ferret conservation activities. After a request for proposals was advertised in late 2011, we selected and worked with the World Wildlife Fund to purchase over 15,000 lbs. of delatamethrin insecticide and other dusting supplies to

help manage plague in the Conata Basin. The last of these supplies was used during dusting efforts in the Basin in 2015 (Griebel 2015).

The U. S. Geological Survey (USGS) National Wildlife Heath Center and other cooperators have developed a sylvatic plague vaccine (SPV) for prairie dogs that is delivered through an oral bait. The efficacy of this vaccine was tested in field trials at 29 sites in seven states from 2013 to 2015 (Rocke et al. 2017). This oral vaccine was applied at Conata Basin/Badlands, Wind Cave National Park and Bad River Ranch reintroduction sites in 2017-2019. Studies to determine the efficacy, resistance and effect on non-target arthropods of deltamethrin and two additional pulicides (fipronil and cyfluthrin) are being conducted at the Conata Basin/Badlands site under the direction of David Eads, Fort Collins Science Center, USGS. Plague management using deltamethrin or fipronil occurs at Bad River Ranches, Conata Basin/Badlands, Cheyenne River Sioux Reservation, Lower Brule Sioux Reservation Standing Rock Sioux Reservation, and Wind Cave National Park reintroduction sites.

GFP has funded research projects through South Dakota State Wildlife Grants (SWG). "Understanding the relationship between prairie dog ecology and black-footed ferret resource selection" (SWG T-35-R-1) has resulted in the following publications:

Eads, D. A. 2009. Evaluation and development of black-footed ferret resource selection models. M.S. Thesis, University of Missouri, Columbia.

Eads, D.A., D.E. Biggins, D.S. Jachowski, T.M. Livieri, J.J. Millspaugh, and M. Forsberg. 2010. Morning ambush attacks by black-footed ferrets on emerging prairie dogs. Ethology, Ecology & Evolution 22:345-352.

Eads, D. A., J. J. Millspaugh, D. E. Biggins, D. S. Jachowski, and T. M. Livieri. 2011. Evaluation of a black-footed ferret resource selection model. Journal of Wildlife Management 75:1155-1163.

Eads, D. A., J. J. Millspaugh, D. E. Biggins, T. M. Livieri, and D. S. Jachowski. 2011. Post-breeding resource selection by adult black-footed ferrets in the Conata Basin, South Dakota. Journal of Mammalogy 92:760-770.

Eads, D. A., D. E. Biggins, D. Marsh, J. J. Millspaugh, and T. M. Livieri. 2012. Black-footed ferret digging activity in summer. Western North American Naturalist 72:140-147.

Eads, D. A., D. S. Jachowski, D. E. Biggins, T. M. Livieri, M. R. Matchett, and J. J. Millspaugh. 2012. Resource selection models are useful in predicting distributions of black-footed ferrets in prairie dog colonies. Western North American Naturalist 72:206-215.

Eads, D. A., D. S. Jachowski, J. J. Millspaugh, and D. E. Biggins. 2012. Importance of lunar and temporal conditions for spotlight surveys of adult black-footed ferrets. Western North American Naturalist 72:179-190.

Jachowski, D. S., J. J Millspaugh, D. E. Biggins, T. M. Livieri, M. R. Matchett. 2008. Implications of black-tailed prairie dog spatial dynamics to black-footed ferrets. Natural Areas Journal 28:14-25.

Jachowski, D. S., J. J. Millspaugh, D. E. Biggins, T. M. Livieri and M. R. Matchett. 2010. Home-range size and spatial organization of black-footed ferrets Mustela nigripes in South Dakota, USA. Wildlife Biology. 16:66-76.

Jachowski, D.S., J.J. Millspaugh, D.E. Biggins, T.M. Livieri, M.R. Matchett, and C.D. Rittenhouse. 2011. Resource selection by black-footed ferrets in South Dakota and Montana. Natural Areas Journal 31:218-225.

A research project investigating the factors that affect territoriality and productivity of black-footed ferrets (SWG T-38-R-1) resulted in the following publications:

Grassel, S. M. 2015. Ecological relationships of black-footed ferrets, American badgers, and black-tailed prairie dogs in South Dakota. Ph.D. Dissertation, University of Idaho, Moscow.

Grassel, S. M., J. L. Rachlow, and C. J. Williams. 2016. Reproduction by black-tailed prairie dogs and black-footed ferrets: Effects of weather and food availability. Western North American Naturalist 76:405-416.

A preliminary investigation into the role of small mammals in the maintenance of plague (SWG T-60-R-1) resulted in the following publications.

Maestas, L. P. and H. B. Britten 2017. Flea and Small Mammal Species Composition in Mixed-Grass Prairies: Implications for the Maintenance of *Yersinia pestis*. Vector-Borne and Zoonotic Diseases 17: 467-474.

Maestas, L. P. 2018. The vector chronicles: The implications of plague management on ectoparasite and host ecology, and the search for *Ixodes scapularis* and *Borrella burgdorferin* in South Dakota. Ph.D. Dissertation, University of South Dakota, Vermillion.

Maestas, L. P. and H. B. Britten. 2019. Effects of deltamethrin treatment on small mammal and ectoparasite population dynamics and plague prevalence in a North American mixed-grass prairie system. Journal of Vector-Borne and Zoonotic Diseases 19:274-283.

GFP also funds projects through the Wildlife Diversity's Small Grants Program, resulting in the following reports or publications:

Livieri, T. L. 2013. Assessing the risk of plague to black-footed ferrets in Conata Basin, South Dakota. Final Report to South Dakota Department of Game, Fish and Parks 28 April 2013. Prairie Wildlife Research, Wellington, Colorado. 12 pages.

Mize, E. L. and H. B. Britten. 2013. Yersinia pestis prevalence in fleas collected from South Dakota swift fox and black-footed ferrets. Final Report to South Dakota Department of Game, Fish and Parks 20 March 2013. University of South Dakota, Vermillion. 11 pages.

Mize, E. L., S. M. Grassel and H. B. Britten. 2017. Fleas of black-footed ferrets (*Mustela nigripes*) and their potential role in the movement of plague. Journal of Wildlife Diseases 53: 521-531.

To encourage private and tribal landowners to become willing participants in black-footed ferret reintroductions on their property, the USFWS established a Programmatic Black-footed Ferret Safe Harbor Agreement (SHA) in 2013. This agreement provides participating

landowners assurances that they will not be subject to additional future regulatory restrictions or commitments. This SHA is applicable across the 12-state historical range of the black-footed ferret, including South Dakota. As part of the SHA, the Natural Resources Conservation Service (NRCS) has made technical and financial assistance available to landowners to help recover the black-footed ferret. The development of the SHA and the NRCS landowner incentive program is supported by a Memorandum of Understanding (MOU) among the USFWS, NRCS, USGS, U.S. Animal and Plant Inspection Service and WAFWA, of which GFP is a member. The reintroduction site on Bad River Ranch in Stanley County is the first reintroduction site in the state located on privately-owned land. This reintroduction was made possible by landowner enrollment in the SHA. The Bad River Ranch is owned by Turner Enterprises, Inc.

Ongoing

Given the dependence of black-footed ferrets on prairie dogs, conservation of this species facilitates black-footed ferret recovery. Since 2002, GFP has been monitoring colony acreage and distribution of black-tailed prairie dogs in the state. This information is collected as part of the state conservation and management plan for the black-tailed prairie dog (Cooper and Gabriel 2005). These data are used not only for determining changes in state management actions related to black-tailed prairie dogs but have proven beneficial for the conservation and management of other wildlife species.

The most recent prairie dog acreage and distribution project in South Dakota was described in Kempema and Weidler (2022). The Executive Summary from this report is as follows:

> We documented 422,548 acres (170, 999 ha) of black-tailed prairie dog (*Cynomys ludovicianus*) colonies in 31 counties in South Dakota by visually interpreting aerial images within a GIS. Total colony acreage in 2020 was divided by landownership as follows: 119,333 acres (48,292 ha) on tribal lands and 303,215 acres (122,706 ha) on non-tribal land. The statewide (199,472 acres; 80,723.5 ha) and non-tribal (166,958 acres; 67,565.5 ha) colony acreage goals set forth in the state prairie dog conservation and management plan (Cooper and Gabriel 2005) were achieved in 2020, thus no changes in current management action are required.
> https://gfp.sd.gov/userdocs/docs/prairiedogmappingreport.pdf

The Conata Basin/Badlands reintroduction site remains of critical importance to the recovery of this species. Travis Livieri of Prairie Wildlife Research found at least 142 unique individual black-footed ferrets in Conata Basin and Badlands National Park during 2023 surveys. The ratio of kits:adults was 1.58:1, slightly higher than the ratio observed during 2022. The population decreased by 28% from 2022 to 2023 (Livieri 2023).

Recovery Criteria/Goals

GFP will cooperate with the USFWS in meeting downlisting and delisting goals detailed in the recovery plan (U.S. Fish and Wildlife Service 2013). State-specific delisting guidelines are suggested in the USFWS recovery plan for the species. The recommended contribution from South Dakota is 204 adult ferrets that would require 30,000 colony acres.

Primary Reviewer: Silka Kempema, wildlife biologist

Other Staff or Experts Involved in the Review: Eileen Dowd Stukel, Senior Wildlife Biologist

Date Review Updated: June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate:
2018; approved by GFP Commission in April
2020; approved by GFP Commission in September
2022; approved by GFP Commission in September

References or Information Sources:

Cooper, J., and L. Gabriel. 2005. South Dakota black-tailed prairie dog conservation and management plan.

Griebel, R. L. 2015. Conata Basin/Badlands Area 2015 Plague Management Report. Buffalo Gap National Grassland, Wall Ranger District.

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.

Jackson, T. 2020. Strategies for Black-footed Ferret (BFF) Field Activities, Special Precautions due to COVID-19, June 2, 2020. Black-footed Ferret Conservation Subcommittee, Black-footed Ferret Recovery Implementation Team, U.S. Fish and Wildlife Service, Denver, CO.

Kempema, S. L. F., R. Scott, and J. M. Weidler. 2022. Colony acreage and distribution of the black-tailed prairie dog in South Dakota, 2020. South Dakota Department of Game, Fish and Parks Wildlife Division Report Number 2022-04, Pierre, South Dakota USA. https://gfp.sd.gov/userdocs/docs/prairiedogmappingreport.pdf accessed 13 June 2024.

Livieri, T. 2023. Conata Basin/Badlands National Park Black-footed Ferret Monitoring Report Summer/Fall 2023. Prairie Wildlife Research, Stevens Point, WI, USA.

Rocke, T. E., D. W. Tripp, R. E. Russell, R. C. Abbott, K. L. D. Richgels, M. R. Matchett, D. E. Biggins, R. Griebel, G. Schroeder, S. M. Grassel, D. R. Pipkin, J. Cordova, A. Kavalunas, B. Maxfield, J. Boulerice, M. W. Miller. 2017. Sylvatic Plague Vaccine Partially Protects Prairie Dogs (Cynomys spp.) in Field Trials. EcoHealth. DOI: 10.1007/s10393-017-1253-x.

South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.

U.S. Fish and Wildlife Service. 2013. Recovery plan for the black-footed ferret (*Mustela nigripes*).

SUMMARY OF UPDATES IN 2024:

- Provided Executive Summary of most recent prairie dog acreage evaluation conducted by SDGFP.
- Provided summary of 2023 population surveys for the Conata Basin/Badlands site from Travis Livieri of Prairie Wildlife Research.

STATE T&E SPECIES STATUS REVIEW

Species Name: Swift Fox, *Vulpes velox*

South Dakota Status, including legal status and special listings:

- State threatened (SD Administrative Rule 41:10:02:04, List of threatened mammals)
- Monitored by South Dakota Natural Heritage Program
- State Heritage rank S3 (vulnerable; state species rank last reviewed 2020)
- Included as a Species of Greatest Conservation Need in the South Dakota Wildlife Action Plan (SDGFP 2014)
- Classified in South Dakota statute as a fur-bearing animal (SD Codified Law 41-1-1). Due to its state threatened designation by South Dakota Game, Fish and Parks (GFP) Commission, no harvest by trapping or shooting is allowed. Take is allowed only through a permitting process for certain authorized purposes.

Federal Status:

- NatureServe global rank G3 (vulnerable); last reviewed 5 April 2016
- Considered a sensitive species in Region 2 of the U.S. Forest Service
- Considered a sensitive species by the Bureau of Land Management in South Dakota
- A candidate species under the Endangered Species Act from 1995 through 2001

Basis for new listing, status change (T to E, or E to T), or continued listing with same status:

Specific justifications for original state listing are unknown. This is likely the result of inadequate documentation. By the early 1900's swift fox populations were considered severely depleted due to habitat conversion, unregulated trapping, and poisoning programs. Secondary poisoning from strychnine-laced carcasses used for controlling wolves was considered the primary cause of decline. The species is easily trapped, and early unregulated harvest may have also contributed to early declines. Continued listing as a state threatened species is recommended.

Description, biology and life history:

A small, tan, long-legged fox that stands about 12" at the shoulder and is 2-3' long. Fur is yellowish to buff-gray above, white below. Legs are tan to orange. Tail is bushy and black tipped. Black markings on either side of the snout will differentiate this species from young coyotes. Unlike red fox, swift fox do not have black on their legs.

Breeding begins in February or March. After a 7.5 week gestation period, an average litter of four young is born in April or May. Pups will appear above ground at 4 to 5 weeks old and disperse from their natal den in early fall.

Swift fox are opportunistic foragers traveling long distances during the night in search of prey (jackrabbits, cottontails, prairie dogs, ground squirrels, mice, insects, birds and carrion). Diet contains species that humans often consider pests.

Natural sources of mortality include predation by coyotes, badgers, bobcats, red fox and golden eagles. Swift fox are susceptible to vehicle collisions, shooting, and poisoning. Conversion of grasslands to croplands has affected swift fox populations in some areas. Also, a shift from wolf- to coyote-dominated canine communities may be preventing swift fox recovery due to interspecific competition.

Habitat:

Open, level or gently rolling landscapes with short-stature land cover (< 12") providing good mobility and visibility are preferred. Swift fox use the modified burrows of other animals or dig their own burrows for use as year-round dens. Dens may be in a variety of places including hilltops, slopes, ridges, level pastures, ditches, cultivated fields, rangeland or prairie dog colonies.

Distribution within the state:

Historically, the range of this species is thought to have coincided with the shortgrass and mixed-grass prairies of North America. South Dakota, excluding the extreme eastern portion, is often depicted in reference documents as occurring within the historical range of this species. However, the easternmost historical record of swift fox in South Dakota is from Hughes County (Sovada et al. 2009). A small population in southern Fall River County continues to persist. See Figure 1 for confirmed reports and reintroduction sites through 2020.

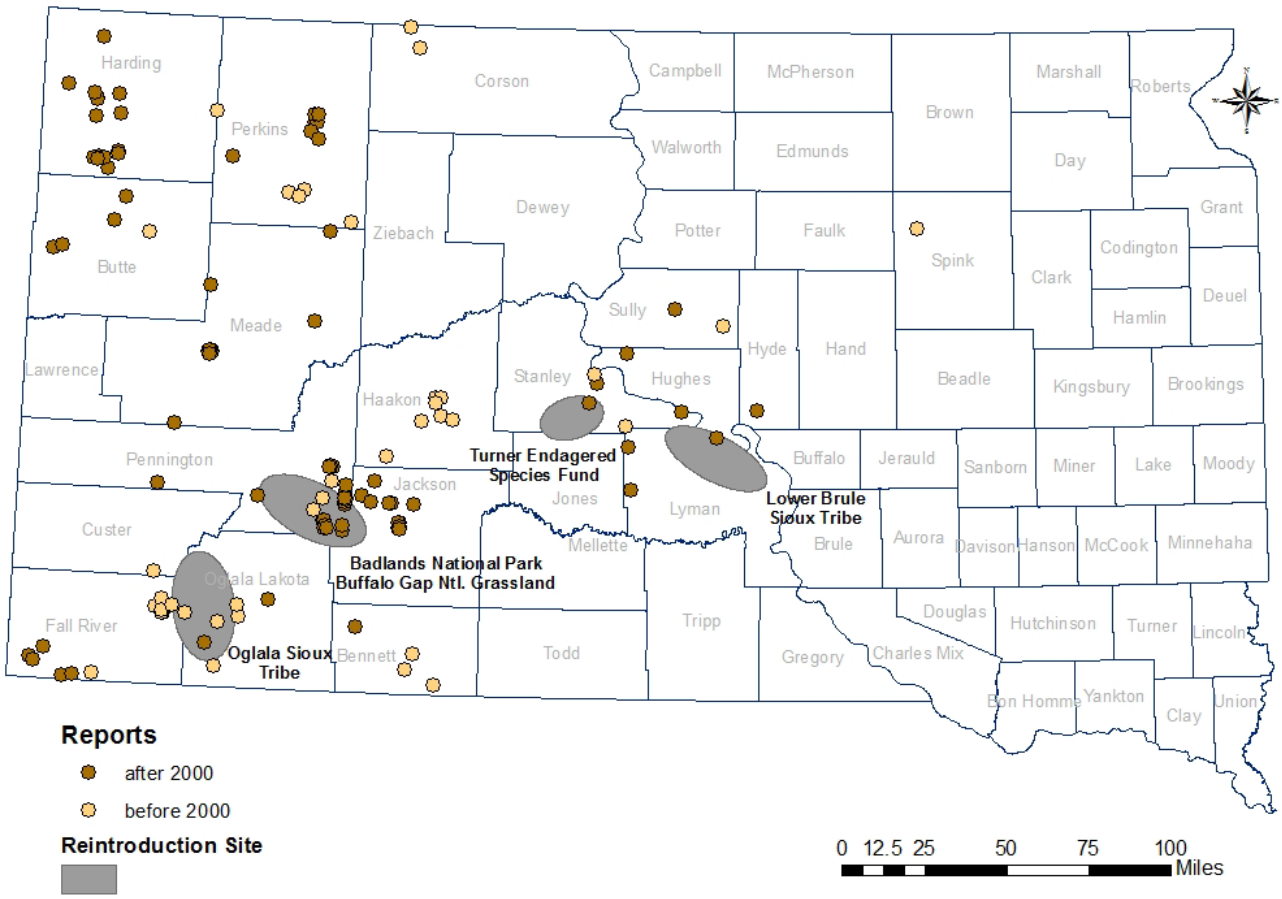


Figure 1. Location of confirmed swift fox reports (1963 through 2020) and general location of reintroduction sites in South Dakota. Reports are comprised of sightings, incidental take, road kill, den sites and one location of a radio collar.

Conservation / Management Considerations:

Predation and interspecific competition with coyote and red fox are known to be limiting factors to swift fox population growth (Stukel 2011). Grassland conversion is also a threat to species recovery. Human activities continue to pose a threat to swift fox recovery in South Dakota. This species is vulnerable to vehicle collisions, shooting, trapping and poisoning. Secondary poisonings can occur from anticoagulant rodenticides used to control prairie dogs. The presence of plague in western South Dakota and the impact on black-tailed prairie dogs, rabbits and other small mammals may also affect swift fox by reducing prey availability and increasing vegetation structure on prairie dog colonies. Years of above average precipitation and the resulting growth of vegetation (absent grazing) may limit this species at the eastern edge of its range, including South Dakota.

Conservation Efforts in South Dakota:

Past

Since 1994, GFP has been an active participant in the Swift Fox Conservation Team (SFCT). The SFCT is comprised of 10 state wildlife management agencies and other interested cooperators within the species' range. The SFCT developed and updated *A Conservation Assessment and Conservation Strategy for Swift Fox in the United States* (Kahn et al. 1997, Stukel 2011). The goal of this conservation assessment and strategy (CACS) is to maintain or restore swift fox populations in each state to provide spatial, genetic and demographic structure of the U.S. swift fox population to ensure long-term viability, provide species management flexibility and encourage population connectivity.

Four reintroductions have occurred in South Dakota:

1. Turner Endangered Species Fund released 180 wild-caught foxes and 46 captive-born pups onto their Bad River Ranches in Stanley County from 1999 through 2007. Observations of swift fox occur in this area (Stratman 2015). However, swift fox have not become established at this site.

2. Badlands National Park and Buffalo Gap National Grassland released 114 wild-caught foxes from 2003-2006 in Pennington County. Swift fox are present in this area. Levels of genetic diversity in this population indicate a successful reintroduction (Sasmal et al. 2012). However, Nevison (2017) expressed concern regarding the status of this population and recommended that no additional reintroductions be conducted until factors limiting success are addressed.

3. The Lower Brule Sioux Tribe released 119 wild-caught swift fox from 2006 through 2008 on the Lower Brule Sioux Reservation in Lyman and Stanley counties. Swift fox have not become established at this site.

4. Oglala Sioux Parks and Recreation Authority released 79 wild-caught swift fox onto Pine Ridge Reservation from 2009 through 2010 in Oglala Lakota County. Swift fox are present on the reservation. Camera and live-trapping efforts in 2013 and 2014 documented 4 dens and at least six individuals (Stratman 2015).

One of the intents of multiple reintroductions is to provide connectivity among those sites and with a small naturally occurring population near Ardmore, SD. There has been evidence that this has occurred.

A State Wildlife Grant-funded project (SWG T-78-R1) associating species presence with the distribution of coyotes and red fox in western South Dakota resulted in the following report and thesis:

Mitchell, E.L. 2018a. Associating swift fox presence with the distribution of other carnivores in western South Dakota. Final Report to SD Game, Fish and Parks. May 2018. South Dakota State University, Brookings. 59 pages and,

Mitchell, E.L. 2018b. Distribution, ecology, disease risk, and genetic diversity of swift fox (Vulpes velox) in the Dakotas. M.S. Thesis, South Dakota State University, Brookings.

The Bad River Ranch introduction was funded, in part, by State Wildlife Grant funds (SWG T-25). The following publications were produced:

Jenks, J. 2010. Assessing Swift Fox (*Vulpes velox*) habitat use and resource selection in the pup-rearing period in the mixed grass prairie of west-central South Dakota. Final Report to South Dakota Department of Game, Fish and Parks. South Dakota State University, Brookings.

Sasmal. I. 2011. Population viability analysis of swift fox (*Vulpes velox*) at the Badlands National Park. Ph.D. Dissertation, South Dakota State University, Brookings.

Sasmal, I., J. A. Jenks, T. W. Grovenburg, S. Datta, G. M. Schroeder, R. W. Klaver, and K. M. Honness. 2011. Habitat selection by female swift foxes (*Vulpes velox*) during the pup-rearing season. Prairie Naturalist 43(1/2):29-37.

Sasmal, I., J. A. Jenks, L. P. Waits, M. G. Gonda, G. M. Schroeder, and S. Datta. 2012. Genetic diversity in a reintroduced swift fox population. Conservation Genetics 14:93-102.

GFP also funds projects through the Wildlife Diversity's Small Grants Program including the following:

Mize, E. L. and H. B. Britten. 2013. *Yersinia pestis* prevalence in fleas collected from South Dakota swift fox and black-footed ferrets. Final Report to South Dakota Department of Game, Fish and Parks 20 March 2013. University of South Dakota, Vermillion. 11 pages.

GFP provided monetary support to assess the status of the reintroduced population in and around Badlands National Park. The following thesis was produced:

Nevison, Sarah A. 2017. Swift foxes in southwestern South Dakota: Assessing the current status of a reintroduced population. M.S. Thesis, South Dakota State University, Brookings.

Additional research on swift fox conducted in South Dakota:

Russell, T. A. 2006. Habitat selection by swift foxes in Badlands National Park and the surrounding area in South Dakota. M.S. Thesis. South Dakota State University, Brookings.

Schroeder, G. M. 2007. Effect of coyotes and release site selection on survival and movement of translocated swift foxes in the Badlands ecosystem of South Dakota. M.S. Thesis. South Dakota State University, Brookings.

GFP has funded a number of swift fox monitoring efforts that are summarized in reports of the SFCT and available for viewing at the team's website: http://cpw.state.co.us/learn/Pages/SwiftFoxConservationTeam.aspx.

A Memorandum of Agreement was developed among GFP and the U.S. Fish and Wildlife Service with the Lower Brule Sioux Tribe and with the Oglala Sioux Tribe to designate roles and responsibilities, promote and facilitate coordination and communication with regards to swift fox conservation on and near respective tribal properties.

Present

The SFCT continues to meet periodically. The most recent meeting during the fall of 2023 focused primarily on encouraging individual partner agencies, tribes, researchers, and NGOs to provide input for a new CACS. This document summarizes progress made since the previous CACS (Stukel 2011) and chart a course for the next decade. Matt Peek, Kansas Parks and Wildlife, is leading this effort. A draft CACS document is currently in review.

Three members of the SFCT coauthored the swift fox chapter in an updated reference about wild furbearers in North America (Peek et al. 2024).

Future

If funding were available, a high priority for this species is a comprehensive evaluation of past studies and monitoring efforts in the state and identification of a monitoring method to more fully understand distribution, status, and possible translocation needs. More consistent monitoring data would facilitate a better understanding of the long-term future of this species.

Recovery Criteria/Goals

Recovery criteria are not proposed at this time because of the need for additional information.

Recovery Criteria Considerations

Nevison (2017) and Mitchel (2018b) have provided insights into the status of the swift fox populations in southwestern and northwestern South Dakota, respectively. Reduced distribution, decreasing population numbers as well as low survival rates around Badlands National Park suggest that factors are limiting success at this reintroduction site (Nevison 2017) and those factors should be addressed before additional reintroductions are conducted.

The small swift fox population in northwestern South Dakota is unique from other populations with high estimated annual survival rates and selection of dens sites far from roads (~600 m) (Mitchell 2018b). Coyote predation was the primary cause of mortality. Swift fox presence in this part of the state was negatively correlated with both red fox and coyote. One of 31 swift fox tested positive for antibodies for plague, but with no obvious direct effects on the species. Indirect effects of plague may include reduced prey availability (prairie dogs, rabbits, etc.). This population is small and viable, but genetic diversity is low, and the population is at risk of inbreeding and loss of diversity over time.

There are areas in the state where the species may be present, although surveys have not yet been conducted and incidental reports are lacking. We recommend continuing to monitor species distribution through surveys and incidental reports as well as mapping, monitoring and assessing the quality of remaining native prairie to help identify areas suitable for expansion, reintroduction and conservation. Follow-up to Nevison (2017) and Mitchell (2018b) to address limiting factors and ensure long-term viability of existing populations should be conducted.

Information on the requirements of intact habitat blocks for swift fox within the state is needed. Current modeling efforts to identify and qualify swift fox habitat in portions of Montana, the Dakotas and Wyoming (Moehrenschlager et al. 2006, Olimb et al. 2010) may be useful if coupled with results from recent and thorough survey efforts.

The role of interspecific interactions with other canines and apparent preference for areas along roads may have stronger influence than availability or quality of habitat. Research studies obtaining information on interspecific interactions may be needed. A range-wide population estimate, and a minimum viable population estimate for South Dakota would enhance our knowledge of species status. However, obtaining an accurate wildlife population estimates for species that are rare or hard to survey requires a significant investment. Use of a population index, measured over time to inform species status is recommended. Population monitoring through surveys and incidental reports should continue if species is delisted.

Primary Reviewer: Silka Kempema, wildlife biologist

Other Staff or Experts Involved in the Review: Eileen Dowd Stukel, GFP; Kristy Bly, World Wildlife Fund; Shaun Grassel, Lower Brule Sioux Tribe

Date Review Updated: June 2024 (Eileen Dowd Stukel)

Dates of Other Reviews, if appropriate:
2018; approved by GFP Commission in April; 2020; approved by GFP Commission in September; and 2022; approved by GFP Commission in September

References or Information Sources:

Harris, H. F., editor. 2020 Swift fox conservation team: Report for 2017–2018. Montana Fish, Wildlife & Parks, Glasgow, MT.

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.

Kahn, R., L. Fox, P. Horner, B. Giddings, and C. Roy, editors. 1997. Conservation assessment and conservation strategy for swift fox in the United States.

Mitchell, E.L. 2018a. Associating swift fox presence with the distribution of other carnivores in western South Dakota. Final Report to SD Game, Fish and Parks. May 2018. South Dakota State University, Brookings. 59 pages.

Mitchell, E.L. 2018b. Distribution, ecology, disease risk, and genetic diversity of swift fox (*Vulpes velox*) in the Dakotas. M.S. Thesis, South Dakota State University, Brookings.

Moehrenschlager, A., S. Alexander, and T. Brichieri-Colombi. 2006. Habitat suitability and population viability analysis for reintroduced swift foxes in Canada and northern Montana. Centre for Conservation Research Report No. 2, Calgary, Alberta, Canada.

NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: March 16, 2015).

Nevison, Sara A. 2017. Swift foxes in southwestern South Dakota: Assessing the current status of a reintroduced population. M.S. thesis. South Dakota State University, Brookings.
Olimb, S., K. Bly, and C. Huang. 2010. Swift fox habitat suitability index for eastern Montana. Northern Great Plains Program, World Wildlife Fund. Bozeman, MT.
Peek, M. S., E. Dowd Stukel, and D. L. Schwalm. 2024. Swift fox. Pages 34.1-34.30 *in* T. L. Hiller, R. D. Applegate., R. D. Bluett, S. N. Frey,. E. M. Gese, and J. F. Organ, editors. Wild furbearer management and conservation in North America. Wildlife Ecology Institute, Helena, Montana, USA. http://doi.org/10.59438/SRWF4476.
Russell, T. A. 2006. Habitat selection by swift foxes in Badlands National Park and the surrounding area in South Dakota. M.S Thesis. South Dakota State University, Brookings.
Sasmal, I. 2011. Population viability analysis of swift fox (*Vulpes velox*) at the Badlands National Park. PhD Dissertation. South Dakota State University, Brookings.
Sasmal, I., J. A. Jenks, L. P. Waits, M. G. Gonda, G. M. Schroeder, and S. Datta. 2012. Genetic diversity in a reintroduced swift fox population. Conservation Genetics 14:93-102.
Schroeder, G. M. 2007. Effect of coyotes and release site selection on survival and movement of translocated swift foxes in the Badlands ecosystem of South Dakota. M.S. Thesis. South Dakota State University, Brookings.
South Dakota Department of Game, Fish and Parks (SDGFP). 2014. South Dakota Wildlife Action Plan. Wildlife Division Report 2014-03. South Dakota Department of Game, Fish and Parks, Pierre.
Sovada, M. A., R. O. Woodward, and L. D. Igl. 2009. Historical range, current distribution, and conservation status of the swift fox, *Vulpes velox*, in North America. The Canadian Field-Naturalist 123:346-367.
Stratman, M. R., editor. 2013. Swift fox conservation team: report for 2011-2012. Colorado Division of Parks and Wildlife.
_____. 2015. Swift fox conservation team: report for 2013-2014. Colorado Division of Parks and Wildlife.
Stukel, E. D., editor. 2011. Conservation assessment and conservation strategy for swift fox in the United States-2011 update. South Dakota Department of Game, Fish and Parks, Pierre, SD.
Stukel, E. D., editor. 2017 Swift fox conservation team: Report for 2015–2016. Wildlife Division Report No. 2017-04, SD Department of Game, Fish and Parks, Pierre, SD.

SUMMARY OF UPDATES IN 2024:

- Recent activities of the SFCT were described, including a recent book chapter coauthored by 3 SFCT members for the revised reference “Wild Furbearer Management and Conservation in North America” and an update Conservation Assessment and Conservation Strategy document for this species.

Appendix A. South Dakota Endangered Species Law

CHAPTER 34A-8
ENDANGERED AND THREATENED SPECIES

34A-8-1 Definition of terms.
34A-8-2 Investigation of wildlife by secretary--Information developed.
34A-8-3 Lists of endangered and threatened species promulgated--Basis for determination.
34A-8-4 Biennial review of lists of endangered and threatened species--Amendments.
34A-8-5 Lists of endangered or threatened species--Add or remove species.
34A-8-6 Departments to manage, protect, and restore endangered and threatened species.
34A-8-7 Programs and agreements for management of endangered species--Prairie dog control on private lands.
34A-8-8 Permitting capture of endangered and threatened species--Authorized purposes.
34A-8-9 Possession, transportation and sale of endangered and threatened species prohibited--Violation as misdemeanor.
34A-8-10 Importation, possession, sale, or purchase of endangered or threatened species under permit, license, or other documentation--Violation as misdemeanor.
34A-8-11 Permits for capture or destruction of, wildlife to protect life or property--Violation of permit--Emergency protection of human life.
34A-8-12 Repealed by SL 1992, ch 158, § 50.
34A-8-13 Legislative approval required for reintroduction of species.

34A-8-1. Definition of terms.

Terms as used in this chapter, unless the context otherwise requires, mean:

(1) "Endangered species," any species of wildlife or plants which is in danger of extinction throughout all or a significant part of its range other than a species of insects determined by the Game, Fish and Parks Commission or the secretary of the United States Department of Interior to constitute a pest whose protection under this chapter would present an overwhelming and overriding risk to man;

(2) "Nongame species," any wildlife species not legally classified a game species, fur-bearer, threatened species, or as endangered by statute or regulations of this state;

(3) "Threatened species," any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range;

(4) "Wildlife," any nondomesticated animal, whether reared in captivity or not, and includes any part, product, egg, or offspring thereof, or the dead body or parts thereof.

Source: SL 1977, ch 335, § 1.

34A-8-2. Investigation of wildlife by secretary--Information developed.

The game, fish and parks secretary shall conduct investigation on nongame, endangered, or threatened wildlife to develop information relating to population, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary to ensure their perpetuation as viable components of their ecosystem and for human enjoyment.

Source: SL 1977, ch 335, § 3.

34A-8-3. Lists of endangered and threatened species promulgated--Basis for determination.

On the basis of determinations pursuant to § 34A-8-2 the Game, Fish and Parks Commission shall promulgate a list of those species of wildlife which are determined to be endangered or threatened within the state. The Game, Fish and Parks Commission shall make these determinations on the basis of the best scientific, commercial, and other data available to them and after consultation, as appropriate, with federal agencies, other interested state agencies, other states having a common interest in the species and interested persons and organizations.

Source: SL 1977, ch 335, § 3.

34A-8-4. Biennial review of lists of endangered and threatened species--Amendments.

The Game, Fish and Parks Commission shall conduct a review of the state list of endangered and threatened species within the period ending July 3, 1979, and every two years thereafter and may amend the list by appropriate additions or deletions.

Source: SL 1977, ch 335, § 3.

34A-8-5. Lists of endangered or threatened species--Add or remove species.

The Game, Fish and Parks Commission may not add a species to nor remove a species from any list pursuant to § 34A-8-3 or 34A-8-4, until it has:

(1) Promulgated a rule, pursuant to chapter 1-26, for the addition or removal of the subject species; and

(2) Notified the Governor of any state sharing a common border with this state and in which the subject species is known to exist that such action is being proposed.

Source: SL 1977, ch 335, § 3; SL 2021, ch 164, § 1.

34A-8-6. Departments to manage, protect, and restore endangered and threatened species.

The Department of Game, Fish and Parks and the Department of Agriculture and Natural Resources shall perform those acts necessary for the conservation, management, protection, restoration, and propagation of endangered, threatened, and nongame species of wildlife.

Source: SL 1977, ch 335, § 2; SL 2021, ch 1 (Ex. Ord. 21-3), § 51, eff. Apr. 19, 2021.

34A-8-7. Programs and agreements for management of endangered species--Prairie dog control on private lands.

The secretary of agriculture and natural resources and the secretary of game, fish and parks shall establish programs, with legislative approval and may enter into cooperative agreements with federal and state agencies or with private persons as deemed necessary for the management of nongame, endangered, or threatened species. The secretaries shall establish and conduct control programs at state expense on private lands that are encroached upon by prairie dogs from contiguous public lands.

Source: SL 1977, ch 335, § 4; SL 2021, ch 1 (Ex. Ord. 21-3), § 51, eff. Apr. 19, 2021.

34A-8-8. Permitting capture of endangered and threatened species--Authorized purposes.

The secretary of agriculture and natural resources and the secretary of game, fish and parks may permit the taking, possession, purchase, sale, transportation, exportation, or shipment of species of plants or wildlife which appear on the state list of endangered or threatened species for scientific, zoological, or educational purposes, for propagation in captivity of such fish or wildlife to insure their survival.

Source: SL 1977, ch 335, § 4; SL 2021, ch 1 (Ex. Ord. 21-3), § 51, eff. Apr. 19, 2021.

34A-8-9. Possession, transportation and sale of endangered and threatened species prohibited--Violation as misdemeanor.

Except as otherwise provided in this chapter, no person may take, possess, transport, import, export, process, sell, or offer for sale, buy or offer to buy, nor may a common or contract

carrier transport or receive for shipment, any species of wildlife or plants appearing on the following lists:

(1) The list of wildlife and plants indigenous to the state determined to be endangered or threatened within the state pursuant to §§ 34A-8-3 and 34A-8-4.

(2) The United States list of endangered or threatened native wildlife effective on January 1, 1977.

(3) The United States list of endangered or threatened foreign wildlife effective on January 1, 1977.

(4) The United States list of endangered or threatened plants effective on January 1, 1977.

A violation of this section is a Class 2 misdemeanor.

Source: SL 1977, ch 335, § 5; SL 1992, ch 158, § 48.

34A-8-10. Importation, possession, sale, or purchase of endangered or threatened species under permit, license, or other documentation--Violation as misdemeanor.

A species of wildlife appearing on any of the lists enumerated in § 34A-8-9 may enter South Dakota from another state or from a point outside the territorial limits of the United States and may be transported, possessed, sold, and purchased in accordance with the terms of a permit issued pursuant to rules promulgated by the Game, Fish and Parks Commission pursuant to chapter 1-26. However, a person may transport into South Dakota or otherwise possess, sell, or purchase within the state any animal or parts thereof appearing on any of the lists enumerated in § 34A-8-9 that were lawfully taken or acquired in another state or lawfully taken or acquired from a point outside the territorial limits of the United States if the items are accompanied by the appropriate license, documentation, Convention on International Trade in Endangered Species (CITES) permit, or CITES tag. It is a Class 2 misdemeanor to transport, possess, sell or purchase a species of wildlife appearing on any of the lists enumerated in § 34A-8-9 in violation of the conditions of a permit, or to transport, possess, sell, or purchase any part thereof, in violation of the provisions of this section. The provisions of this section do not apply to any captive nondomestic animal of the mammalia class and the products thereof regulated by the Animal Industry Board under Title 40.

Source: SL 1977, ch 335, § 6; SL 1993, ch 256, § 34; SL 2007, ch 236, § 4.

34A-8-11. Permits for capture or destruction of, wildlife to protect life or property--Violation of permit--Emergency protection of human life.

Upon good cause shown and where necessary to alleviate damage to property or to protect human health, endangered or threatened species found on the state list may be removed, captured, or destroyed pursuant to a permit issued by the secretary of game, fish and parks. A violation of the terms of the permit is a Class 2 misdemeanor.

Carnivorous animals found on the state list may be removed, captured, or destroyed by any person in emergency situations involving an immediate threat to human life, provided that the removal, capture, or destruction shall be reported to the secretary or his representative within twenty-four hours of the act.

Source: SL 1977, ch 335, § 7; SL 1992, ch 158, § 49.

34A-8-12. Repealed by SL 1992, ch 158, § 50.

34A-8-13. Legislative approval required for reintroduction of species.

No species that is currently extinct in this state and that has been placed on the threatened or endangered species list pursuant to the federal "Endangered Species Act of 1973," as amended to January 1, 1995, may be reintroduced into this state through action by any federal, state, or local governmental entity, unless the Legislature has specifically enacted legislation naming the species and specifying the manner of reintroduction.

Source: SL 1995, ch 206.

Appendix B. South Dakota Law Related to Black-footed Ferret Reintroduction

41-11-15. Reintroduction of black-footed ferret.

The Department of Game, Fish and Parks and the Department of Agriculture and Natural Resources may participate in programs to reintroduce the black-footed ferret if the following conditions are being met:

(1) Areas containing prairie dogs but not having the potential to support black-footed ferrets shall be identified, evaluated and declared ferret-free;

(2) The existing United States Forest Service Prairie Dog Management Plan for the Conata Basin, Buffalo Gap National Grasslands shall be strictly adhered to, and if future increases in prairie dog acres are needed, a funding mechanism shall be established to provide financial compensation to landowners suffering lost income;

(3) No additional land may be acquired for ferrets through condemnation, and the multiple use concept of the United States Forest Service shall be continued;

(4) The initial ferret reintroduction efforts shall be concentrated within the boundaries of Badlands National Park, and once release techniques are refined, the prairie dog management plan on the Buffalo Gap National Grasslands is functioning and local citizens have had the opportunity to view the progress, then reintroduction efforts may be expanded to the grasslands; and

(5) The United States Fish and Wildlife Service shall attempt to provide for the continued meeting on a regular basis during and after the ferret reintroduction of the local level committee consisting of representatives of the United States Forest Service, Pine Ridge Indian Reservation, United States National Parks Service, United States Fish and Wildlife Service, affected state agencies, private organizations, and local landowners.

Source: SL 1992, ch 301; SL 2021, ch 1 (Ex. Ord. 21-3), § 14, eff. Apr. 19, 2021.

MINE CONTACT REPORT FORM

Date of Call:		**Date of E-mail:**	07/14/2025
Telephone call to:		**DENR Employee Contacted:**	Roberta Hudson
Operator Contacted:	Mandy Pearson		
Company:	Game, Fish, and Parks		
Telephone:			
Staff Signature:	\s/		

On July 14, 2025, Mandy Pearson with GFP submitted the restrictions for the Clean Nuclear Uranium Exploration Permit 453. All communications with GFP, including providing the application to Stan Michals in 2024 and Mandy Pearson on May 13, 2025, are included below.

From: Hudson, Roberta
Sent: Tuesday, July 15, 2025 8:19 AM
To: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Cc: Speiser, Jessica <Jessica.Speiser@state.sd.us>
Subject: RE: Clean Nuclear Energy Comments

Thank you! I will only need to change "mining" out to "exploration". Otherwise, these will work!

Roberta Hudson, PE
Engineer Manager I
Minerals, Mining, and Superfund Program

From: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Sent: Monday, July 14, 2025 6:15 PM
To: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Cc: Speiser, Jessica <Jessica.Speiser@state.sd.us>
Subject: RE: Clean Nuclear Energy Comments

Hi Roberta,

We are requesting round nesting bird, raptor nest, and bat roost surveys. I've detailed it below but feel free to not use the full verbiage.

Ground-Nesting Bird Surveys
If mining is scheduled during the nesting season (April–July), conduct surveys immediately prior to ground disturbance to avoid impacting active nests. Early surveys may not accurately reflect current nest activity. Submit nest locations and species observed to SDGFP to determine appropriate buffer distances.

Raptor Nest Surveys
Survey the project area and surrounding vicinity for active and inactive raptor nests. Document species, nest status, and distance to proposed mining operations. Submit active nest data to SDGFP to determine appropriate buffer distances.

Bat Roost Surveys
Survey all live/dead trees and geological structures within the project area, especially within 300 feet of drill pads or disturbance zones. Potential roosts must not be removed during the active bat season (May–September). Emergence surveys may be needed to confirm use. If bats or active roosts are found, maintain a 300-foot buffer. Submit potential/confirmed roost locations, observations, and survey results to SDGFP.

Thanks,

Mandy Pearson | *Senior Wildlife Biologist*
Wildlife Diveristy and Environmental Review
South Dakota Game, Fish, and Parks
4130 Adventure Trail | Rapid City, SD 57702
916.390.9031 | mandy.pearson@state.sd.us

From: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Sent: Monday, July 14, 2025 11:04 AM
To: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Subject: RE: Clean Nuclear Energy Comments

Mandy,

Do you have any restrictions for this application?

Thank you!

Roberta Hudson, PE
Engineer Manager I
Minerals, Mining, and Superfund Program

From: Hudson, Roberta
Sent: Wednesday, June 4, 2025 8:16 AM
To: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Subject: RE: Clean Nuclear Energy Comments

No, you are not too late. I have until the end of July to develop conditions so they can be presented before the Board.

From: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Sent: Tuesday, June 3, 2025 6:54 PM
To: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Subject: Clean Nuclear Energy Comments

Hi Roberta,

Am I too late to submit comments for the Clear Nuclear Energy project that we visited on the 14th? Sorry about the delay. I can get that together asap, if I still have time.

Thanks,

Mandy Pearson | *Senior Wildlife Biologist*
South Dakota Game, Fish, and Parks
4130 Adventure Trail | Rapid City, SD 57702
916.390.9031 | mandy.pearson@state.sd.us

From: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Sent: Tuesday, May 13, 2025 4:11 PM
To: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Subject: RE: [EXT] Clean Nuclear Energy Exploration Application

I know the archaeology surveys were completed. I am not sure about any vegetation or wildlife surveys.

From: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Sent: Tuesday, May 13, 2025 5:09 PM
To: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Subject: RE: [EXT] Clean Nuclear Energy Exploration Application

Thanks Roberta! So is this project much further along than Lion Rock? It looks like a lot of surveys have been done already.

Mandy Pearson | *Senior Wildlife Biologist*
South Dakota Game, Fish, and Parks
4130 Adventure Trail | Rapid City, SD 57702
916.390.9031 | mandy.pearson@state.sd.us

From: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Sent: Tuesday, May 13, 2025 4:01 PM
To: Pearson, Mandy <Mandy.Pearson@state.sd.us>
Subject: FW: [EXT] Clean Nuclear Energy Exploration Application

Mandy,

Here is the Clean Nuclear application supplied to Stan Michals last year. I am not aware if Stan required any surveys for this area or if he followed up with Crystal Hocking as requested below.

As noted below, please keep test hole locations confidential as per SDCL 45-6D-15.

Please let me know if you have any restrictions.

See you tomorrow for the site inspection!

Roberta Hudson, PE
Engineer Manager I
Minerals, Mining, and Superfund Program

From: Hudson, Roberta
Sent: Wednesday, March 20, 2024 8:57 AM
To: Michals, Stan <Stan.Michals@state.sd.us>
Subject: FW: [EXT] Clean Nuclear Energy Exploration Application

Stan,

I have attached the application she is referring to. Due to the proximity of the site to Craven Canyon we have not started a timeclock on this yet. Please let Crystal know if there is anything you would like to see completed from this area. Also, maps showing proposed hole locations are considered confidential as per SDCL 45-6D-15 so please do not share them outside of the agency.

Thanks!

Roberta Hudson, PE
Engineer Manager I
Minerals, Mining, and Superfund Program

From: Crystal Hocking <crystal.hocking@respec.com>
Sent: Tuesday, March 19, 2024 12:42 PM
To: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Cc: John Glasscock <cowboyexpjwg@msn.com>; Holm, Eric <Eric.Holm@state.sd.us>; Mike Blady <mikeblady@gmail.com>
Subject: RE: [EXT] Clean Nuclear Energy Exploration Application

Comments received.

We had assumed that a cultural survey would be a permit condition, but we will be reaching out to SHPO regarding what they want to see for next steps.

In the meantime, I also assume that GFP may have some biological survey requirements that may become a permit condition. Because the survey window for nesting raptors (and sometimes plant species) is a short window, and we don't want to miss an opportunity for a field survey this spring, would it be possible for us, or your office, to provide GFP a copy of the application so that they can review and provide recommendations for any field biology surveys?

Crystal M. Hocking, PG PE
RESPEC
605.394.6451

From: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Sent: Tuesday, March 19, 2024 7:38 AM
To: Crystal Hocking <crystal.hocking@respec.com>; Mike Blady <mikeblady@gmail.com>
Cc: John Glasscock <cowboyexpjwg@msn.com>; Holm, Eric <Eric.Holm@state.sd.us>
Subject: RE: Clean Nuclear Energy Exploration Application

Mr. Blady,

I have attached our procedural completeness letter for the Clean Nuclear Energy Corp uranium exploration application. Please address the items within the letter so we can proceed with processing this application.

If you have any questions, please feel free to contact me at (605) 773-4201.

Thank you!

Roberta Hudson, PE
Engineer Manager I
Minerals, Mining, and Superfund Program

From: Crystal Hocking <crystal.hocking@respec.com>
Sent: Friday, March 15, 2024 3:13 PM
To: Hudson, Roberta <Roberta.Hudson@state.sd.us>
Cc: Mike Blady <mikeblady@gmail.com>; John Glasscock <cowboyexpjwg@msn.com>; Holm, Eric <Eric.Holm@state.sd.us>
Subject: RE: [EXT] Clean Nuclear Energy Exploration Application

The copy of the application has been submitted to the Fall River Register of Deeds (see attached).

Crystal M. Hocking, PG PE
RESPEC
605.394.6451

From: Crystal Hocking
Sent: Monday, March 11, 2024 9:53 PM
To: Hudson, Roberta <roberta.hudson@state.sd.us>
Cc: Mike Blady <mikeblady@gmail.com>; John Glasscock <cowboyexpjwg@msn.com>; Holm, Eric <eric.holm@state.sd.us>
Subject: Clean Nuclear Energy Exploration Application

Ms. Hudson,

On behalf of Clean Nuclear Energy Corp, please find the attached cover letter and application package for a proposed exploration program.

We will get a hard copy of the application (including the application fee) in the mail to the DANR as well as provide a copy to the Fall River County Register of Deeds later this week.

Crystal M. Hocking, PE, PG
Project Geologist

RESPEC
3824 Jet Drive
Rapid City, SD 57703
605.394.6451 office
respec.com