

South Dakota Wildlife Action Plan

Appendix A. South Dakota Game, Fish and Parks letter of intent to revise South Dakota Wildlife Action Plan and U.S. Fish and Wildlife Service response letter.



DEPARTMENT OF GAME, FISH, AND PARKS

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

August 11, 2010

David MacGillivray
U.S. Fish and Wildlife Service
Chief, Wildlife and Sport Fish Restoration Program
Denver Federal Center
PO Box 25486
Denver, CO 80225-0486

Dear Mr. MacGillivray,

I am writing to inform you that our agency intends to begin the process of revising the South Dakota Wildlife Action Plan during the fall of 2010. We are currently finalizing the proposal to be submitted as a planning grant for State Wildlife Grants matching funds at a 75% federal cost share.

Since we intend to review and potentially revise our list of species of greatest conservation need, we consider this to be a major revision. We are familiar with and following the "Guidance for Wildlife Action Plan Review and Revisions" prepared by the Service and the Association of Fish and Wildlife Agencies.

We look forward to working with the Service on this important conservation planning instrument.

Sincerely,

Jeffrey R. Vonk,
Department Secretary
SD Department of Game, Fish, and Parks

cc: Scott Larson, USFWS, Pierre, SD; Nora Kohlenberg, SDGFP, Pierre, SD; Tony Leif, SDGFP, Pierre, SD

Office of Secretary: 605.773.3718 Wildlife Division: 605.223.7660 Parks/Recreation Division: 605.773.3391 FAX: 605.773.6245
TTY: 605.223.7884

South Dakota Wildlife Action Plan

Appendix A (continued). South Dakota Game, Fish and Parks letter of intent to revise South Dakota Wildlife Action Plan and U.S. Fish and Wildlife Service response letter.



United States Department of the Interior



FISH AND WILDLIFE SERVICE Mountain-Prairie Region

IN REPLY REFER TO:
WSFR/FWS/R6

MAILING ADDRESS:
Post Office Box 25486
Denver Federal Center
Denver, Colorado 80225-0486

STREET LOCATION:
134 Union Blvd.
Lakewood, Colorado 80228-1807

Jeffrey R. Vonk, Department Secretary
South Dakota Department of Game, Fish, and Parks
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182



Dear Mr. Vonk:

Thank you for your letter of August 11, 2010, alerting us to your intention to complete a major revision to your State Wildlife Action Plan (SWAP). Evaluation and update of the lists of Species of Greatest Conservation Need should strengthen the SWAP and define the focus of cooperative efforts to conserve and manage all of South Dakota's wildlife.

As a reminder, the July 12, 2007, "Guidance for Wildlife Action Plan Review and Revision" (Guidance), copy enclosed, requires that a state implementing a major revision prior to the planned review/revision date must submit a modified SWAP which includes:

- Summary of all significant revisions;
- Documentation describing how the revision meets the required Eight Elements, including an up-to-date public review process specified in Elements 7 and 8; and
- A "road map" to locate revisions in the SWAP.

The Guidance also encourages posting an electronic version of the SWAP on the Web with the summary of significant changes and a "road map."

South Dakota Wildlife Action Plan

Appendix A (continued). South Dakota Game, Fish and Parks letter of intent to revise South Dakota Wildlife Action Plan and U.S. Fish and Wildlife Service response letter.

Jeffrey R. Vonk, Department Secretary

Please periodically keep us apprised of your progress and all meeting and workshops. We look forward to receiving the revised draft SWAP in the fall of 2010. At that time the U. S. Fish and Wildlife Service (Service) Regional Review Team (RRT) will review the SWAP with input from our office. The RRT will determine whether the revision is approvable and provide a letter to the State Director with documentation of the decision. If it is determined that the revision is not approvable, the letter will include a description of any required actions. State Directors can appeal to the Service Regional Director

We appreciate your continuing attention to South Dakota's natural resources and look forward to working with you on the revision to your SWAP. If you have any questions, please feel free to contact me at (303) 236-4411 or Connie Young-Dubovsky at (303) 236-8179.

Sincerely,



David McGillivray
Chief, Division of Wildlife and Sport Fish Restoration

Enclosure

South Dakota Wildlife Action Plan

Appendix B. Summary of suggestions from Association of Fish and Wildlife Agencies (AFWA 2012) incorporated into the South Dakota Wildlife Action Plan Revision.

Chapter 1 – Prioritization

- recommendation to use NatureServe methodology to assess extinction risk
- include geographically-isolated subspecies
- update species of greatest conservation need list early in the revision process
- establish clear conservation goals
- group species by habitat
- emphasize coarse-scale biodiversity
- consider the proportion of the species' range that occurs within the state

Chapter 2 – Species and Habitats

- identify conservation opportunity areas
- incorporate information other conservation planning efforts with compatible goals
- clearly describe the purpose and intended uses of maps
- use ecological boundaries
- use models to describe future changes, rather than only describing the current situation
- use point data in addition to species distribution prediction tools, such as GAP models
- use classification systems that facilitate regional and national integration
- maintain flexibility in modeling methodology
- use accepted vegetation classification standards for terrestrial and aquatic habitats
- use accepted or official taxonomic standards for species

Chapter 3 – Threats and Conservation Actions

- conduct a climate change vulnerability assessment
- link climate change to priority actions
- work with regional partners to use climate assessment information

These suggestions should be considered for future plan revisions:

- include climate change impacts as criteria for selecting and prioritizing species of greatest conservation need
- use a classification system to describe conservation projects and to prioritize and categorize conservation actions
- define metrics to measure the effectiveness of conservation actions

South Dakota Wildlife Action Plan

Appendix B (continued). Summary of suggestion in AFWA 2012 incorporated into South Dakota Wildlife Action Plan revision

Chapter 4 – Monitoring

- use scientifically sound monitoring protocols
- assess population, habitats and effectiveness at multiple scales; collaborate in established, long-term monitoring efforts
- participate in alliances such as LCCs and regional wildlife agency associations
- use TRACS auxiliary tools, once they are available

These suggestions should be considered for future plan revisions:

- develop new citizen science programs to augment monitoring
- specify assessable objectives for each conservation action

Chapter 5 – Review and Revision

- use internet as a tool to allow review of drafts and viewing completed WAP
- scale level of partner participation to the type of revision
- use partner newsletters to feature revision updates
- include “how to use this document” section, organized by user type
- use web links for entire document plus segmented version with documents and tools that are easily updated
- provide GIS portal for accessing and downloading data (in development)
- provide hard copies to state libraries (in development)
- create short, condensed version (in development)

Chapter 6 – Partnerships and Public Participation

- identify overlapping priorities
- cultivate partnerships with NRCS and LCCs
- work with neighboring states with common species of greatest conservation need
- coordinate across jurisdictional boundaries; work with international conservation organizations
- interact with state Teaming with Wildlife Coalition
- develop a communications plan
- use a team approach to develop models and maps
- define objectives for public involvement process and relate them to the plan’s methodology
- follow the state’s public notification and comment process
- notify the public of the intent to revise the WAP early in the process
- provide 30-60 days to comment on the WAP
- develop public involvement strategies, such as events, electronic media and public opinion data collection
- document processes used and consideration of comments received
- file and archive all comments received
- emphasize the voluntary nature of the WAP

This suggestion should be considered for future plan revisions:

- follow Collaborative Conservation Model

South Dakota Wildlife Action Plan

Appendix C. Species profiles for species of greatest conservation need.

Terrestrial Species of Greatest Conservation Need

Information on each species can be found in the order listed.

Birds

[American Dipper](#)
[American Three-toed Woodpecker](#)
[American White Pelican](#)
[Baird's Sparrow](#)
[Bald Eagle](#)
[Black Tern](#)
[Black-backed Woodpecker](#)
[Burrowing Owl](#)
[Chestnut-collared Longspur](#)
[Ferruginous Hawk](#)
[Greater Prairie-Chicken](#)
[Greater Sage-Grouse](#)
[Interior Least Tern](#)
[Lark Bunting](#)
[Le Conte's Sparrow](#)
[Lewis's Woodpecker](#)
[Long-billed Curlew](#)
[Marbled Godwit](#)
[Northern Goshawk](#)
[Osprey](#)
[Peregrine Falcon](#)
[Piping Plover](#)
[Ruffed Grouse](#)
[Sprague's Pipit](#)
[Trumpeter Swan](#)
[White-winged Junco](#)
[Whooping Crane](#)
[Willet](#)
[Wilson's Phalarope](#)

Mammals

[Black-footed Ferret](#)
[Black Hills Red Squirrel](#)
[Franklin's Ground Squirrel](#)
[Fringe-tailed Myotis](#)
[Northern Flying Squirrel](#)
[Northern Myotis](#)

Mammals continued

[Northern River Otter](#)
[Richardson's Ground Squirrel](#)
[Silver-haired Bat](#)
[Swift Fox](#)

[Townsend's Big-eared Bat](#)

Reptiles and Amphibians

[Black Hills Redbelly Snake](#)
[Blanchard's Cricket Frog](#)
[Cope's Gray Treefrog](#)
[Eastern Hognose Snake](#)
[False Map Turtle](#)
[Lesser Earless Lizard](#)
[Lined Snake](#)
[Many-lined Skink](#)
[Sagebrush Lizard](#)
[Short-horned Lizard](#)
[Smooth Softshell](#)
[Western \(Ornate\) Box Turtle](#)

Terrestrial Insects

[American Burying Beetle](#)
[Dakota Skipper](#)
[Great Plains Tiger Beetle](#)
[Indian Creek Tiger Beetle](#)
[Iowa Skipper](#)
[Little White Tiger Beetle](#)
[Northern Sandy Tiger Beetle](#)
[Ottoe Skipper](#)
[Pahasapa Fritillary](#)
[Poweshiek Skipperling](#)
[Regal Fritillary](#)

Gastropods

[Dakota Vertigo](#)
[Frigid Ambersnail](#)
[Mystery Vertigo](#)

South Dakota Wildlife Action Plan

Aquatic Species of Greatest Conservation Need

Information on each species can be found in the order listed.

Fishes

- [Banded Killifish](#)
- [Blacknose Shiner](#)
- [Blackside Darter](#)
- [Blue Sucker](#)
- [Carmine Shiner](#)
- [Central Mudminnow](#)
- [Finescale Dace](#)
- [Hornyhead Chub](#)
- [Lake Chub](#)
- [Logperch](#)
- [Longnose Sucker](#)
- [Mountain Sucker](#)
- [Northern Pearl Dace](#)
- [Northern Redbelly Dace](#)
- [Pallid Sturgeon](#)
- [Shovelnose Sturgeon](#)
- [Sicklefin Chub](#)
- [Southern Redbelly Dace](#)
- [Sturgeon Chub](#)
- [Topeka Shiner](#)
- [Trout-Perch](#)

Freshwater Mussels

- [Creek Heelsplitter](#)
- [Elktoe](#)
- [Hickorynut](#)

- [Higgins Eye](#)
- [Mapleleaf](#)
- [Pimpleback](#)
- [Rock Pocketbook](#)
- [Scaleshell](#)
- [Yellow Sandshell](#)

Aquatic Insects

- [Analettris eximia \(A Mayfly\)](#)
- [Dakota Stonefly](#)
- [Dot-winged Baskettail](#)
- [Elusive Clubtail](#)

Map legend (for more information, see [Figure 2-1](#))

- Summer** 
- Migration** 
- Winter** 
- Year Round** 
- Aquatic SGCN**
- Confirmed** 
- Probable** 
- Historic** 
- Current** 

South Dakota Wildlife Action Plan

American Dipper

AMDI

Cinclus mexicanus

Description:

Small, stocky, dark grey bird and exhibits a characteristic bobbing motion when it moves.

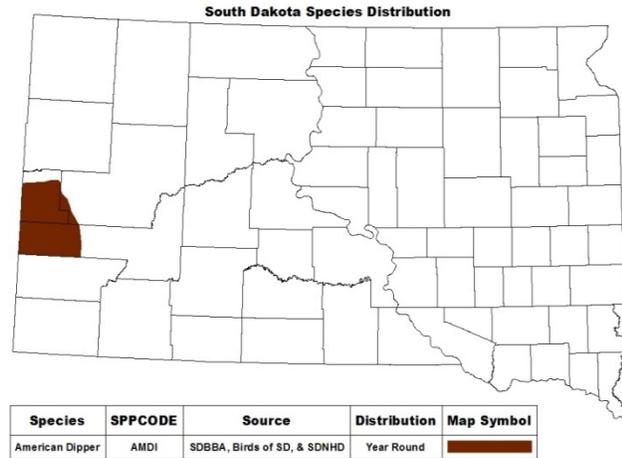
Protection Status:

Federal: None

State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout MLRA 62 but today its distribution is limited to the northern portion of its former range - see distribution map on right.



Key Habitat:

Prefers clean, cold, fast flowing mountain streams with abundant aquatic insects.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: Water quality impacts from road building, logging steep slopes adjacent to streams, and pollution from mining, septic tanks, and other sources; reduced release of water from large dams can cause stream to freeze over in winter, resulting in no open water for foraging; reduced stream flows from diversion for irrigation, community water, groundwater wells, or other human-uses; nest-site disturbance due to trail development and other recreational activities adjacent to streams

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: Work with agencies and landowners to protect riparian areas from erratic water levels, erosion, and chemical pollution; develop programs and materials to protect nest sites from disturbance; and investigate genetic diversity of the population

Current Monitoring & Inventory ([Appendix E](#)):

Periodic population monitoring

South Dakota Wildlife Action Plan

SWG Accomplishments ([Appendix F](#)):

Monitoring American dippers in the Black Hills (T-17C)

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Continue to document sightings of color-marked birds

Identify critical wintering areas

Monitor breeding success

Existing Recovery Plans/Conservation Strategies:

Backlund, D. 2005. The American Dipper, *Cinclus mexicanus*, in the Black Hills of South Dakota: Past and Present. South Dakota Dept. of Game, Fish, and Parks.

South Dakota Wildlife Action Plan

American Three-toed Woodpecker

ATTW

Picoides tridactylus

Description:

Medium-sized woodpecker with a mostly black back and white throat, breast and belly.

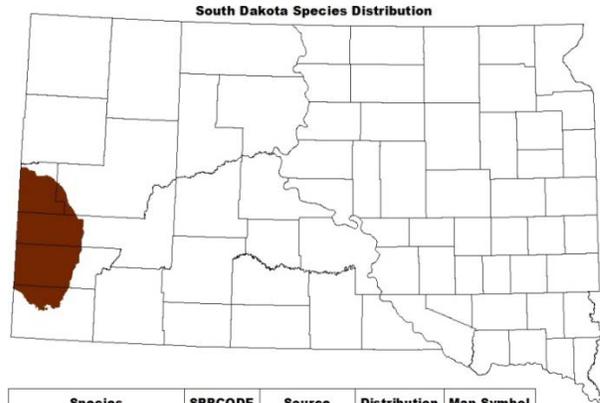
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout MLRAs 61 and 62. See map on right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
American Three-toed Woodpecker	ATTW	SDBBA & SDNHD	Year Round	

Key Habitat:

Prefers spruce forests particularly where dead timber remains after fires; nests in cavities of large dead trees.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: none identified

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-Habitat: Develop programs and educational materials about the role of natural disturbance regimes in maintaining habitat for this species

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

Integrated Monitoring in Bird Conservation Regions

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Biology of American three-toed woodpeckers in the Black Hills (T-18)

Priority Research & Monitoring (Appendices G-K):

Habitat surveys of Black Hills meadows, aspen and conifers

Develop and implement appropriate monitoring techniques

Response to mountain pine beetle infestations

Genetic research on population isolation potential

Existing Recovery Plans/Conservation Strategies:

Wiggins, D. (2004, July 1). American Three-toed Woodpecker (*Picoides dorsalis*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available online: <http://www.fs.fed.us/r2/projects/scp/assessments/americanthreetoedwoodpecker.pdf>

South Dakota Wildlife Action Plan

American White Pelican

AWPE

Pelecanus erythrorhynchos

Description:

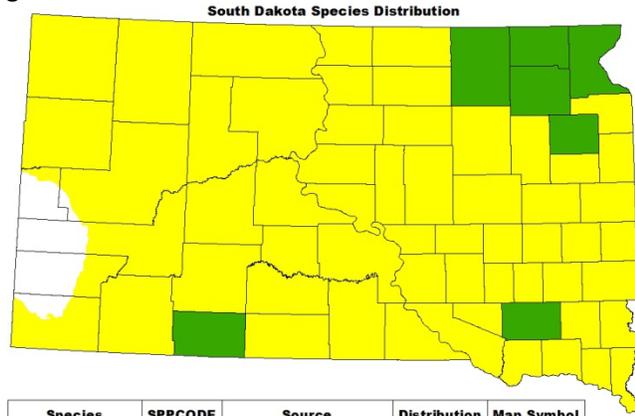
Large, white bird with long flat bill and large throat sac.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat associated with the Missouri River system before impoundment as well as a few other large, shallow water bodies in the state. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
American White Pelican	AWPE	SDBBA, Birds of SD, & SDNHD	Summer	
			Migration	

Key Habitat:

Preferred foraging habitat includes open, shallow lakes with abundant fish and amphibian populations and adjacent loafing sites; nesting and loafing sites are flat, barren, earthen islands in lakes, occasionally in rivers, protected from mammalian predators.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: Diseases; low number of colonies in state; dams/impoundments on rivers and lakes have changed natural water levels eliminating water barriers to predation and flooding nest sites; nest site disturbance from recreational use; pesticides; and illegal shooting

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: Work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide levels near habitat; develop programs and materials to educate the public on appropriate activities near nesting sites or in some instances, protect nesting sites using fencing, postings, etc.; develop programs and materials to reduce illegal shooting; monitor the incidence of disease in nesting colonies; monitor water quality near nesting colonies; conduct research on foraging habitats and impacts on local fisheries; investigate seasonal abandonment of nesting colonies in the northern Great Plains; and investigate the impacts of West Nile Virus

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

- Exploration of factors that influence productivity of American white pelicans at Bitter Lake in northeastern South Dakota (T-27)
- Statewide colonial and semi-colonial waterbird inventory (T-16)
- Colonial and semi-colonial waterbird monitoring (T-52)
- South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Determine factors that may contribute to poor survival; analyze chick mortalities for contaminants
- Establish monitoring program for large colonies, in association with fish contaminant monitoring and pelican disease monitoring

South Dakota Wildlife Action Plan

Baird's Sparrow

BAIS

Ammodramus bairdii

Description:

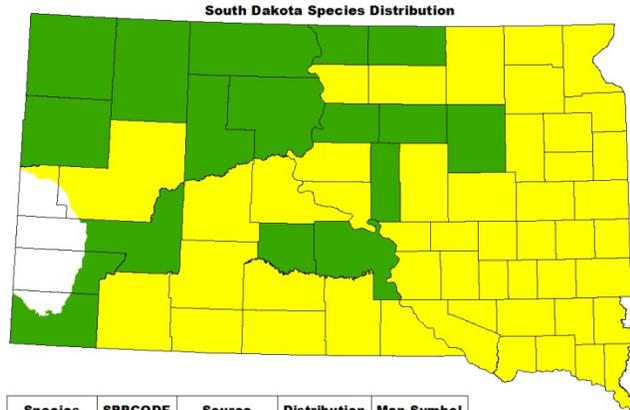
Small, brown bird with a tan face and prominent dark spot on the upper rear of the ear coverts.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See the map at right for current distribution.



Key Habitat:

Prefers lightly grazed native grass ecosystems and wetland meadows with low shrub cover and little woody vegetation.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: draining of wet meadows; nest parasitism by Brown-headed Cowbirds

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-Habitat: Develop programs and educational materials about the role of natural disturbance regimes in maintaining habitat for this species

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Map and assess quality of native prairie on a recurring basis
- Map Grassland Bird Conservation Areas in western South Dakota
- Assess grassland habitat during migration and breeding season

Existing Recovery Plans/Conservation Strategies:

Wiggins, D.A. (2006, June 9). Baird's Sparrow (*Ammodramus bairdii*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/bairdssparrow.pdf>

South Dakota Wildlife Action Plan

Bald Eagle

BAEA

Haliaeetus leucocephalus

Description:

Very large bird of prey with a dark back and undersides. Adults also have a characteristic white head and tail.

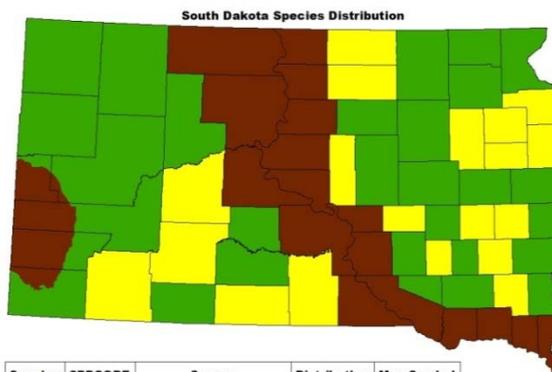
Protection Status:

Federal: None
 State: Threatened

Distribution:

Key Habitat:

Usually found near (within 4 km) water – rivers, lakes, reservoirs; large cottonwood trees used for nesting and roosting; requires large area of clear surface water for feeding.



Species	SPPCODE	Source	Distribution	Map Symbol
Bald Eagle	BAEA	SDGFP, SDNHD, Expert Opinion	Summer	Green
			Migration	Yellow
			Year Round	Brown

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: Removal of nesting and roosting trees near water bodies; decreasing food supply due to over-harvesting of fish and waterfowl by humans; water quality impacts, and/or food chain disruption by exotic species; chronic disturbance by humans or pets, particularly near nest-sites and communal roosts; biocide contamination of food supply; and illegal shooting

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: Work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide levels near habitat; develop programs and materials to educate the public on appropriate activities near nesting sites; and develop programs and materials to reduce illegal shooting

Current Monitoring & Inventory Programs (Appendix E):

- Bald eagle midwinter survey
- Bald eagle nest surveys

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Document causes of mortality
- Map and monitor riparian corridor habitats

Existing Recovery Plans/Conservation Strategies:

- 1) South Dakota Game, Fish and Parks. 2005. South Dakota Bald Eagle (*Haliaeetus leucocephalus*) Management Plan. Available online: <http://gfp.sd.gov/wildlife/docs/bald-eagle-plan.pdf>; 2) U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. 23 pp.

South Dakota Wildlife Action Plan

Black Tern

BLTE

Chlidonias niger

Description:

Small tern with a dark, sooty gray body.

Protection Status:

Federal: None

State: None

Distribution:

Key Habitat:

Prefers marshes, sloughs, rivers, lakeshores, wet meadows with a mixture of emergent vegetation and open water; nests on floating plant matter.



Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: water level manipulations that flood nests or make them vulnerable to predation; nest depredation; pesticides/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to maintain water quality by reducing soil erosion and reducing chemical use near habitat; maintain stable water levels in nesting colonies during nesting season; develop educational programs and post signs to protect nesting sites from disturbance.

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Statewide colonial and semi-colonial waterbird inventory (T-16)

Colonial and semi-colonial waterbird monitoring (T-52)

Priority Research & Monitoring Needs (Appendices G-K):

Periodically monitor colonial waterbird populations

Monitor impacts of tile drainage

Investigate impact of narrowleaf cattail and hybrid species

Existing Recovery Plans/Conservation Strategies:

1) Shuford, W.D. 1999. Status assessment and conservation plan for the black tern (*Chlidonias niger surinamensis*) in North America. US Dept. of Interior, Fish and Wildlife Service, Denver, Co.;

2) Naugle, D.E. 2004. Black Tern (*Chlidonias niger surinamensis*): a technical conservation assessment.

[Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/blacktern.pdf>.

South Dakota Wildlife Action Plan

Black-backed Woodpecker

BBWO

Picoides arcticus

Description:

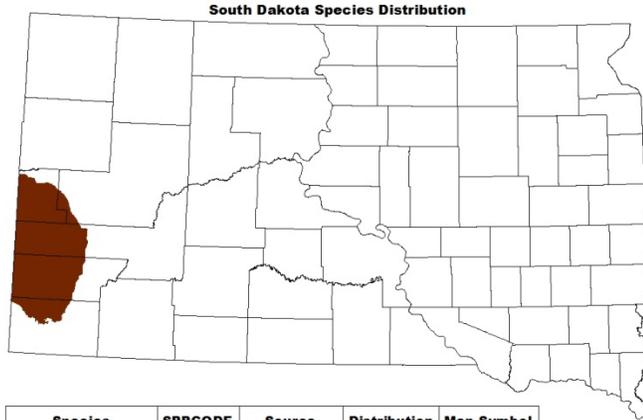
Medium-sized woodpecker with a solid black back and barred sides. Males also have yellow cap.

Protection Status:

Federal: None
State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See the map at right for current distribution.



Key Habitat:

Prefers post-burn forests with high densities of small trees for feeding; nests in excavated cavity of dead, medium to large-sized tree, or live tree with dead heartwood.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
Non-habitat: none

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
Non-Habitat: Develop programs and educational materials about the role of natural disturbance, including historical fire regimes, in maintaining habitat for this species

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey
Integrated Monitoring in Bird Conservation Regions

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)
Black-backed and Lewis's woodpeckers responses to fire; can post-burn use be predicted using pre-burn forest structure variables? (T-3)
Importance of mountain pine beetle infestations and fire as black-backed woodpecker habitat in the Black Hills, South Dakota (T-39)

Priority Research & Monitoring Needs (Appendices G-K):

Continue investigation of mountain pine beetle infestations to black-backed woodpecker home range configurations, foraging patterns and mortality
Habitat surveys of Black Hills meadows, aspen and conifers
Determine relationship between summer prescribed fire, timing of wildfires and black-backed woodpecker habitat

South Dakota Wildlife Action Plan

Burrowing Owl

BUOW

Athene cunicularia

Description:

Small, ground dwelling owl with long legs, white chin stripe, round head, and stubby tail.

Protection Status:

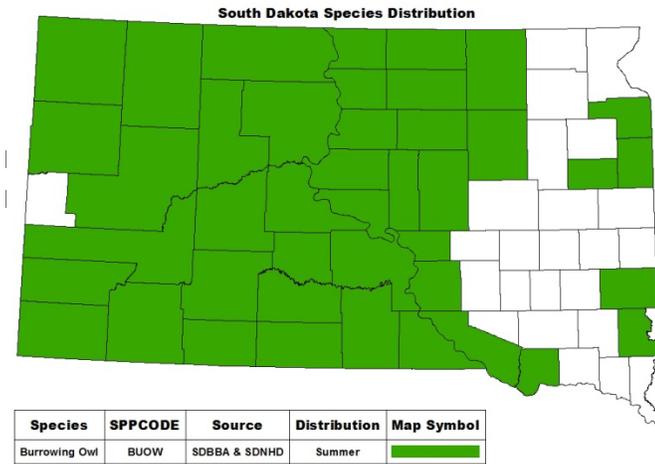
Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota where prairie dogs and ground squirrels occurred.

See map at right for current distribution.



Key Habitat:

Live in colonies using burrows excavated by black-tailed prairie dogs or ground squirrels for cover; prefer burrows in heavily grazed grass ecosystems that provide good horizontal visibility; forage in grass ecosystems with low to moderate grass cover to aid in prey detection.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: elevated structures such as fence posts and utility poles may provide a hunting advantage to avian predators; nest depredation; vehicle collisions

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce the use of pesticides and poisons to control burrowing mammals in Burrowing Owl habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

Black-tailed prairie dog surveys

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Does prairie dog colony size matter? Implications for conservation of grassland biota in SD (T-23)

Burrowing owl distribution in western South Dakota (T-2-5)

Priority Research & Monitoring Needs (Appendices G-K):

Continue to determine habitat requirements and habitat trends

South Dakota Wildlife Action Plan

Existing Recovery Plans/Conservation Strategies:

Klute, D.S., L.W. Ayers, M.T. Green, W.H. Howe, S.L. Jones, J.A. Shaffer, S.R. Sheffield, and T.S. Zimmerman. 2003. Protection Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States. U.S. Department of the Interior; Fish and Wildlife Service, Biological Technical Publication FWS/BTP-R6001-2003, Washington, D.C.

South Dakota Wildlife Action Plan

Chestnut-collared Longspur

CCLO

Calcarius ornatus

Description:

Sparrow-sized bird with black underparts and white on face and wings.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Chestnut-Collared Longspur	CCLO	SDBBA	Summer	Green
		Birds of SD	Migration	Yellow

Key Habitat:

Prefers heterogeneous grazed cover of short and mid-statured grasses, particularly bunchgrasses; avoids shrubby areas; avoids areas with dense litter accumulation.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5; woody plant encroachment; habitat fragmentation

Non-habitat: nest depredation; pesticides/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce the use of pesticides and herbicides in habitat; develop programs and educational materials about the role of natural disturbance regimes in maintaining habitat for this species

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Assess grassland habitat during migration and breeding season

Map Grassland Bird Conservation Areas in western South Dakota

Compare nest success between native and "tame" grasslands

Identify core areas with highest population densities

Continue participation in Saltillo Grasslands, Mexico habitat protection program through Southern Wings partnership

South Dakota Wildlife Action Plan

Ferruginous Hawk

FEHA

Buteo regalis

Description:

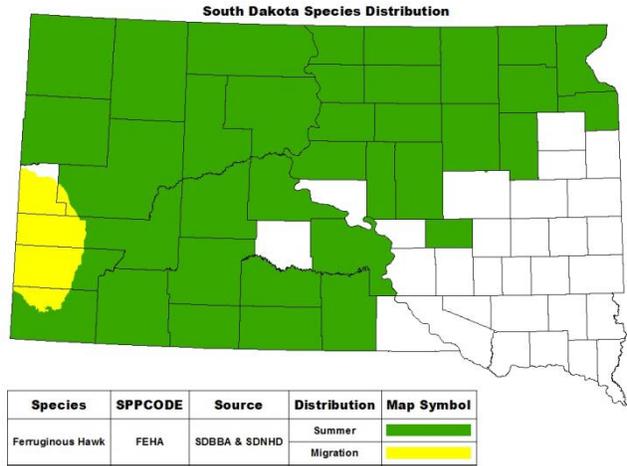
Medium-large bird of prey; rusty brown on the upper parts and pale on the head, neck, and underparts with rust on the legs; upper wings are grey.

Protection Status:

Federal: None
 State: None

Distribution:

Information on the historical distribution of this species is currently lacking but is believed to have primarily occurred as breeding populations in all but MLRAs 61, 62, 102B and 102C. May have also been migratory throughout the state. See map at right for current distribution.



Key Habitat:

Prefers a diversity of grass/shrub ecosystem structures supporting a diversity and abundance of prey such as ground squirrels, jackrabbits and prairie dogs; forages in open, short-statured grass/shrub ecosystems; nests within a short distance of abundant prey sources; prefers to nest in trees but will also nest in shrubs and in tall, clumpy grasses on the ground.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: human disturbance near nest sites; illegal shooting; poisoning of prey base

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies, landowners, and the public to minimize disturbance in key nesting habitat; reduce illegal shooting; work with agencies and landowners to reduce the use of poisons to control prey species

Current Monitoring & Inventory Programs (Appendix E):

- North American Breeding Bird Survey
- Various inventories of nesting and wintering raptors
- Video camera surveys to document prey selection

SWG Accomplishments (Appendix F):

- Breeding ecology of ferruginous hawks and golden eagles in northcentral and western SD (T-58)
- South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Map Grassland Bird Conservation Areas in western South Dakota
- Identify critical habitats and prey preferences
- Research the effects of lead and other contaminants in the ecosystem to raptor populations
- Continue participation in Saltillo Grasslands, Mexico habitat protection program through Southern Wings partnership

South Dakota Wildlife Action Plan

Greater Prairie-Chicken

GRPC

Tympanuchus cupido

Description:

Medium sized grouse with a short dark rounded tail and feathered toes.

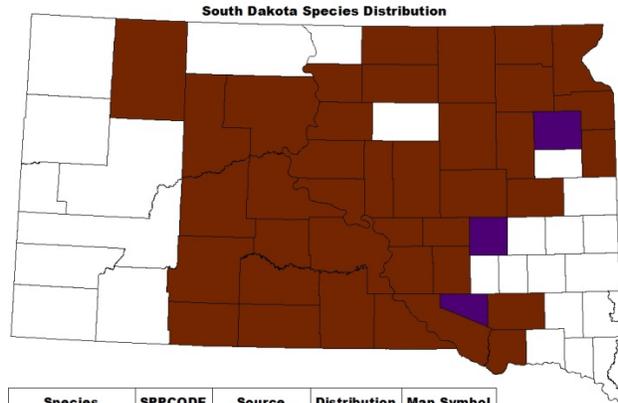
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the possible exception of MLRA 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Greater Prairie-chicken	GRPC	SDBBA & SDGFP	Year Round	
		Birds of SD	Winter	

Key Habitat:

Requires a diversity of grass ecosystem structural conditions depending on breeding, foraging, or nesting activities; leks require open short-statured grass conditions, nest sites require mid-to tall stature grass ecosystems, and foraging habitat appears to be characterized by a diversity of grass structural stages that maximize insect production including wet meadows.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: insecticide use may decrease the availability of insects to young birds; introduced diseases such as West Nile Virus

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

Spring lek survey

Harvest survey; wing collection to estimate hatching dates

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Distribution and lek locations of Greater Prairie-Chickens and Sharp-tailed Grouse outside of their traditional range in South Dakota (T-2-7)

Priority Research & Monitoring Needs (Appendices G-K)

Determine minimum size of habitat block needed

Map Grassland Bird Conservation Areas in western South Dakota

Compare nest success between native and "tame" grasslands

South Dakota Wildlife Action Plan

Existing Recovery Plans/Conservation Strategies:

1) Robb, L.A. and M.A. Schroeder. (2005, April 15). Greater Prairie-Chicken (*Tympanuchus cupido*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/greaterprairiechicken.pdf>; 2) SD Game, Fish and Parks. 2011. Prairie Grouse Management Plan for South Dakota 2011-2015. 26 pp; 3) Vodehnal, W. L., and J. B. Haufler, Compilers. 2007. A grassland conservation plan for prairie grouse. North American Grouse Partnership. Fruita, CO.

South Dakota Wildlife Action Plan

Greater Sage-Grouse

SAGR

Centrocercus urophasianus

Description:

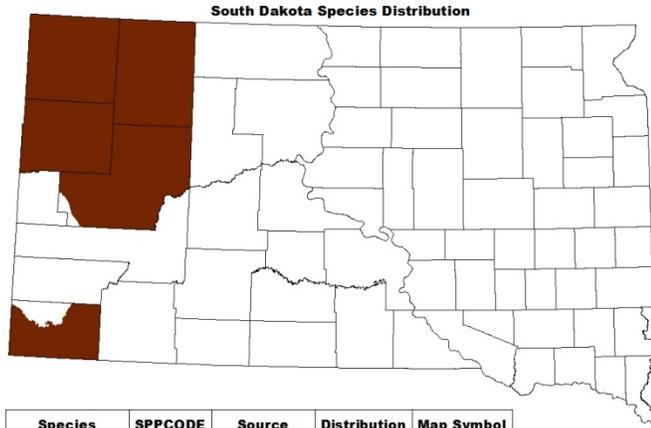
Largest of the North American grouse species; gray with a blackish belly.

Protection Status:

Federal: Candidate
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 58D, 60A, and 61, and possibly the very western portions of 54, 63A, and 64. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Greater Sage-Grouse	SAGR	SDBBA & SDGFP	Year Round	

Key Habitat:

Prefers a diversity of sagebrush-grass ecosystem structural conditions depending on breeding, foraging, or nesting activities; leks require open short-statured grass conditions, nest sites require mid-to tall stature sagebrush-grass ecosystems, and foraging habitat appears to be characterized by a diversity of grass structural stages that maximize insect production including wet meadows.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: collision with fences and powerlines; introduced diseases such as West Nile Virus; presence of elevated structures such as power poles that provide birds of prey with a hunting advantage

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop strategies to reduce the risk of collisions with utility lines and fences; work with agencies and landowners to reduce the presence of elevated structures that provide birds of prey with a hunting advantage

Current Monitoring & Inventory (Appendix E):

Lek surveys and inventories
 Hunter harvest survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)
 Mapping big sagebrush vegetation in western South Dakota (T-29)
 Past and current vegetation conditions of core sagebrush habitat and leks of greater sage-grouse (*Centrocercus urophasianus*) at the easternmost extent of its range in western SD (T-51)

Priority Research & Monitoring Needs (Appendices G-K):

Map, characterize and monitor sagebrush habitat

South Dakota Wildlife Action Plan

Identify and monitor sites in Fall River County with suitable lek, nesting, brood-rearing, and winter habitat

Identify sites for sagebrush restoration

Determine effects of livestock grazing on sagebrush habitat

Existing Recovery Plans/Conservation Strategies:

1) U.S. Fish and Wildlife Service. 2013. Greater Sage-Grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report. U.S. Fish and Wildlife Service, Denver, CO.; 2) Stiver, S.J., A.D. Apa, J.R. Bohne, S.D. Bunnell, P.A. Deibert, S.C. Gardner, M.A. Hilliard, C.W. McCarthy, and M.A. Schroeder. 2006. Greater Sage-grouse Comprehensive Conservation Strategy. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming; 3) Greater Sage-Grouse Management Plan, South Dakota, 2008-2017. South Dakota Dept. of Game, Fish and Parks (<http://gfp.sd.gov/wildlife/docs/sage-grouse-management-plan.pdf>).

South Dakota Wildlife Action Plan

Interior Least Tern

LETE

Sterna antillarum athalassos

Description:

Smallest North American tern

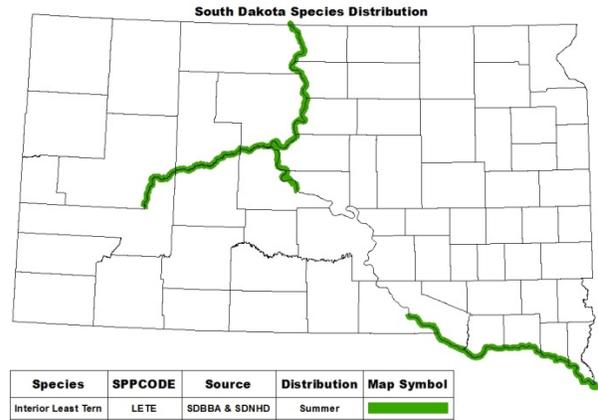
Protection Status:

Federal: Endangered

State: Endangered

Distribution:

This species is believed to have historically occurred in appropriate habitat found in the Missouri River system. See map at right for current distribution.



Key Habitat:

Prefers open areas for feeding and nesting; feeding occurs in the shallow water of lakes, ponds, and rivers located close to nesting areas with an abundance of small fish; nesting habitat is bare or sparsely vegetated sand, shell, and/or gravel beaches, sandbars, islands, and salt flats associated with rivers or lakes.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: human disturbance of nest sites; water pollution caused by pesticides and industrial discharge; predation

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide levels near habitat; perform predator control when necessary; fence off nesting areas to reduce disturbance to nests

Current Monitoring & Inventory Programs (Appendix E):

Nesting surveys along Missouri River; periodic surveys along Cheyenne River

Priority Research & Monitoring Needs (Appendices G-K):

Continued evaluation of nesting requirements and responses to annual available habitat

Existing Recovery Plans/Conservation Strategies:

1) U. S. Fish and Wildlife Service. 1990. Recovery plan for the interior population of the least tern (*Sterna antillarum*). U. S. Fish and Wildlife Service, Twin Cities, Minnesota. 90 pp.; 2) South Dakota Game, Fish and Parks. 2005. Interior Least Tern (*Sterna antillarum athalassos*) and Piping Plover (*Charadrius melodus*) Management Plan. Wildlife Division Report 2005-02. Pierre, SD; 3) U. S. Fish and Wildlife Service. 2013. Interior Least Tern (*Sterna antillarum*) 5-Year Review, Summary and Evaluation. USFWS, Jackson, MS. 75 pp. Available online:

<http://www.fws.gov/southeast/5yearReviews/5yearreviews/interiorLeastTern5yrReivew102413.pdf>

South Dakota Wildlife Action Plan

Lark Bunting

LARB

Calamospiza melanocorys

Description:

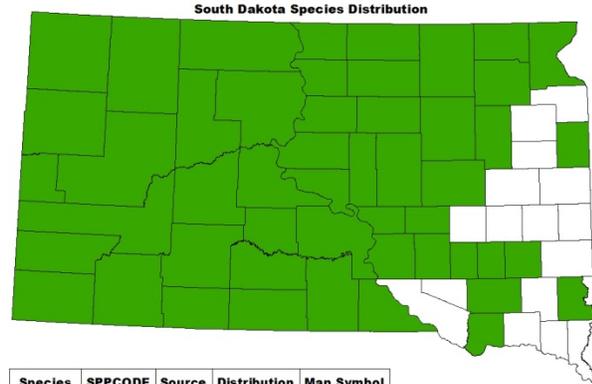
Small bird; males are black with white wing patches, tail coverts and outer tail feathers; female is gray brown above and white below with dusky streaks.

Protection Status:

Federal: None
State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Lark Bunting	LARB	SDBBA	Summer	Green

Key Habitat:

Prefers native grass ecosystems of low to moderate stature with relatively high ground cover; an overstory of shrubs may be present; may nest in colonies with birds roughly distributed every 100 feet.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
Non-habitat: mowing during the nesting season; pesticides/herbicides; parasitism by Brown-headed Cowbirds

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
Non-habitat: work with agencies and landowners to reduce pesticide use to control grasshoppers in habitat

Current Monitoring & Inventory (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Assess grassland habitats during migration and breeding season
Map Grassland Bird Conservation Areas in western South Dakota
Compare nest success between native and "tame" grasslands

South Dakota Wildlife Action Plan

Le Conte's Sparrow

LCSP

Ammodramus leconteii

Description:

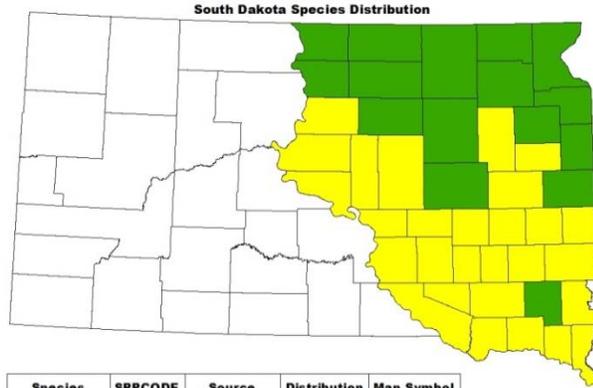
Small bird with a mottled brown back, white belly and crown stripe, and orange-yellow eye stripe and collar.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 53B, 53C, 55B, 55C, 63A, 63B, 102A, 102B, and 102C. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Le Contes Sparrow	LCSP	SDBBA & SDNHD	Summer	
		Birds of SD	Migration	

Key Habitat:

Prefers wet meadows and marshy areas; springs/fens; nests in drier parts; also appears to prefer burned sites 2 years post-burn.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: mowing or grazing during the breeding/nesting season; nest parasitism by Brown-headed Cowbirds; drought

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and materials to educate the public about the role natural disturbance regimes played in maintaining habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Assess grassland habitat during migration and breeding season
 Monitor impacts of tile drainage

South Dakota Wildlife Action Plan

Lewis's Woodpecker

LEWO

Melanerpes lewis

Description:

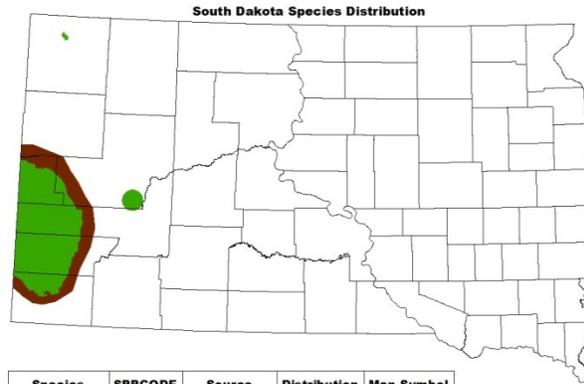
Large woodpecker with a black back and rose red belly.

Protection Status:

Federal: None
State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62, and possibly 58D and 60A. See map at right for current distribution.



Key Habitat:

Prefers fire maintained old-growth ponderosa pine; large snags are used for nest cavities; often found in burned stands.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: European Starlings may outcompete for nest cavities

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to educate the public about the role natural disturbance regimes play in maintaining habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

Integrated Monitoring in Bird Conservation Regions

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Black-backed and Lewis's woodpeckers responses to fire; can post-burn use be predicted using pre-burn forest structure variables? (T-3)

Priority Research & Monitoring Needs (Appendices G-K):

Monitor long-term population trends

Response to mountain pine beetle infestations

Existing Recovery Plans/Conservation Strategies:

Abele, S.C., V.A. Saab, and E.O. Garton. (2004, June 29). Lewis's Woodpecker (*Melanerpes lewis*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available online : <http://www.fs.fed.us/r2/projects/scp/assessments/lewisswoodpecker.pdf>

South Dakota Wildlife Action Plan

Long-billed Curlew

LBCU

Numenius americanus

Description:

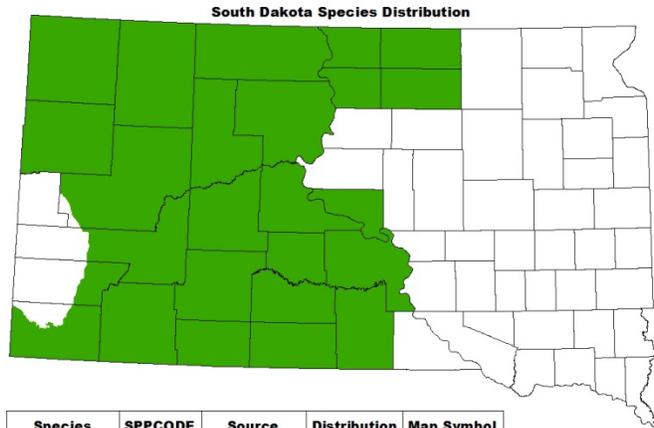
Largest North-American shorebird with a distinctive long, curved bill.

Protection Status:

Federal: None
State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers short grasses (<12 in); may use prairie dog colonies for foraging.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: nest site disturbance due to agricultural practices; human activities; possible spread of mammalian predators into areas they did not occur historically; pesticide/herbicide impacts

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide levels near habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

Nesting success, brood survival, and movements of long-billed curlews (*Numenius americanus*) in grazed landscapes of western South Dakota (T-13)

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Compare nest success between native and "tame" grasslands

Identify core areas for conservation efforts

Determine minimum size of habitat needed

Existing Recovery Plans/Conservation Strategies:

Fellows, S. D., and S. L. Jones. 2009. Status assessment and conservation action plan for the Long-billed Curlew (*Numenius americanus*). U.S. Department of Interior, Fish and Wildlife Service, Biological Technical Publication, FWS/BTP-R6012-2009, Washington, D.C.

South Dakota Wildlife Action Plan

Marbled Godwit

MAGO

Limosa fedoa

Description:

Large shorebird with dark brown plumage and black markings, light brown belly, and long bill.

Protection Status:

Federal: None
State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Marbled Godwit	MAGO	SDBBA	Summer	Green
		Birds of SD	Migration	Yellow

Key Habitat:

Prefers short, sparse to moderately grazed upland prairie intermixed with wet prairie systems; prefers relatively large contiguous blocks (>250 ac); also attracted to burned areas 2 years post-burn.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: loss of grasslands near nest site; human/pet/livestock disturbance of nest

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to protect nesting sites from human disturbance; work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide levels near habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Monitor impacts of tile drainage

Identify high-quality stopover habitat

Compare nest success between native and "tame" grasslands

Existing Recovery Plans/Conservation Strategies:

Melcher, C.P., A. Farmer, and G. Fernández. 2010. Version 1.2. Conservation Plan for the Marbled Godwit (*Limosa fedoa*). Manomet Center for Conservation Science, Manomet, Massachusetts; 2) Skagen, S.K., and G. Thompson. 2013 (updated). Northern Plains/Prairie Pothole Regional Shorebird Conservation Plan, Version 1.0, in United States Shorebird Conservation Plan.

South Dakota Wildlife Action Plan

Northern Goshawk

NOGO

Accipiter gentilis

Description:

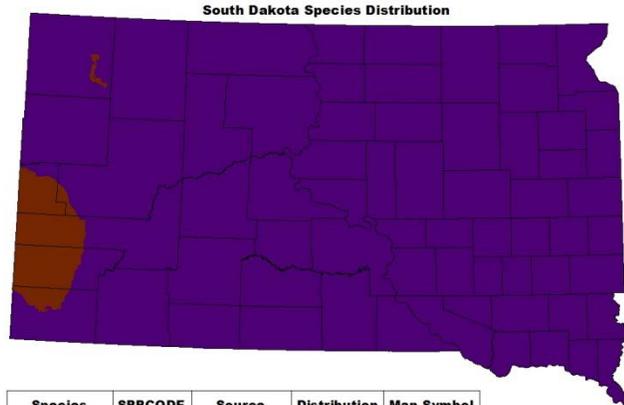
Medium large bird of prey with short, broad wings and a long tail; blue-grey above and barred grey or white below.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate breeding habitat found in MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Northern Goshawk	NOGO	SDBBA & SDNHD	Year Round	
			Winter	

Key Habitat:

Prefers a wide variety of forest types, age classes and structural conditions in a relatively intact large forest matrix; nest sites are usually associated with old growth trees.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: disturbance near nest sites; loss of trees and stands to pine bark beetles

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and materials to educate the public on limiting disturbance near nesting sites

Current Monitoring & Inventory Programs (Appendix E):

Nesting surveys in Black Hills National Forest

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Evaluate wildlife response to mountain pine bark beetle epidemics
 Continue to monitor nest site selection, nesting success, feeding habits and population trends
 Surveys of Black Hills meadows, aspens and conifers

Existing Recovery Plans/Conservation Strategies:

Kennedy, P.L. 2003. Northern goshawk (*Accipiter gentilis atricaupillus*): A technical conservation assessment. Prepared for the USDA, Forest Service, Rocky Mountain Region, Species Conservation Project

South Dakota Wildlife Action Plan

Osprey

OSPR

Pandion haliaetus

Description:

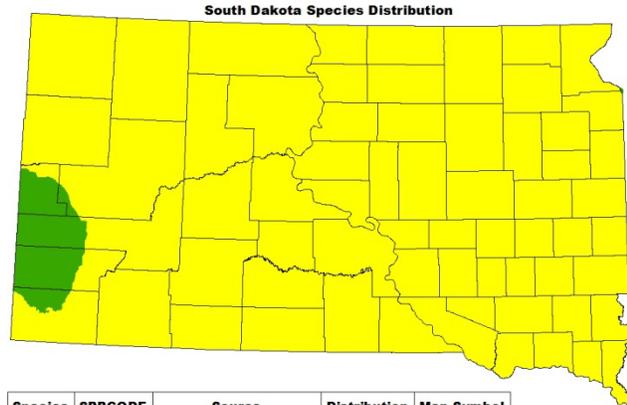
Nearly eagle-sized bird of prey with white head, dark back and white undersides.

Protection Status:

Federal: None
 State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitats in South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Osprey	OSPR	SDBBA, Birds of SD, & SDNHD	Summer	
			Migration	

Key Habitat:

Always found near water – rivers, lakes, ponds; large open-top trees used for nesting and roosting.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: water quality impacts; chronic disturbance by humans or pets; biocide contamination of food supply; illegal shooting

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide use near habitat; develop programs and materials to educate the public on appropriate activities near nesting sites; reduce illegal shooting; develop reintroduction programs for unoccupied suitable habitat

Current Monitoring & Inventory Programs (Appendix E):

- North American Breeding Bird Survey
- Periodic surveys of nesting ospreys, particularly in the Black Hills

SWG Accomplishments (Appendix F):

- Reintroduction of osprey into suitable sites along the Missouri River in South Dakota (T-10)
- South Dakota breeding bird atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Continue to solicit sightings of color-banded birds to evaluate success of reintroduction effort
- Continue periodic monitoring of Black Hills population, including evaluation of nests that may pose risks to powerlines or other structures

South Dakota Wildlife Action Plan

Peregrine Falcon

PEFA

Falco peregrinus

Description:

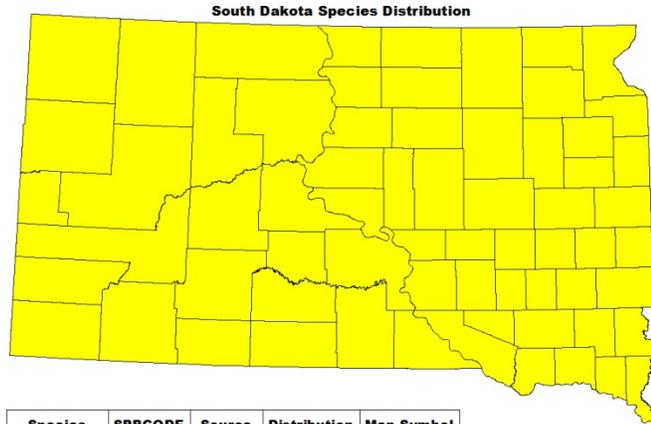
Medium size bird of prey with pale brown back and creamy white and heavily spotted underside.

Protection Status:

Federal: None
State: Endangered

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Key Habitat:

Prefers open grasslands with suitable nesting cliffs and rock outcroppings near a concentrated prey base such as waterfowl or colonial ground squirrels.

Species	SPPCODE	Source	Distribution	Map Symbol
Peregrine Falcon	PEFA	Birds of SD	Migration	Yellow

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: impacts to prey base; pesticides/pollution; human disturbance near nest sites

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide use near habitat; develop programs and materials to educate the public on appropriate activities near nesting sites; develop reintroduction programs for unoccupied suitable habitat

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Peregrine falcon (*Falco peregrinus*) reintroduction in South Dakota (T-10, as amended)

Priority Research & Monitoring Needs (Appendices G-K):

Continue to solicit sightings of color-banded birds to evaluate success of reintroduction efforts

Investigate reports of nesting pairs

Existing Recovery Plans/Conservation Strategies:

U.S. Fish and Wildlife Service. 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.

South Dakota Wildlife Action Plan

Piping Plover

PIPL

Charadrius melodus

Description:

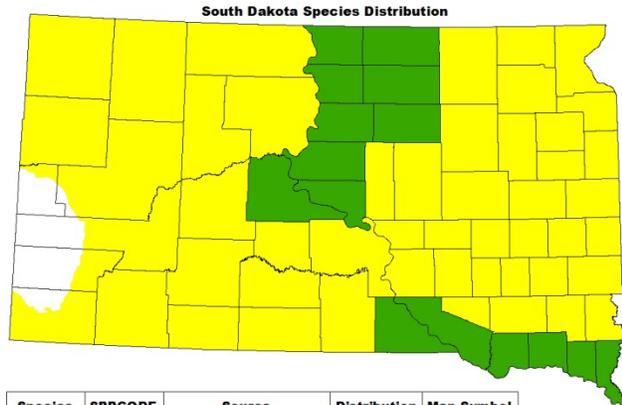
Small, stocky, sandy-colored plover with yellow-orange legs.

Protection Status:

Federal: Threatened
 State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitat found primarily in the Missouri River system. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Piping Plover	PIPL	SDBBA, Birds of SD, & SDNHD	Summer	
			Migration	

Key Habitat:

Prefers shorelines around small alkaline lakes, large reservoirs, or river islands and sandbars with wide beaches (65 ft) and highly clumped but sparse (< 25% cover) vegetation.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: water management on rivers and reservoirs may cause flooding of nests; nest depredation; human disturbance of nest sites; possibly pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide use near habitat; fence off or cage nesting areas to reduce disturbance and predation to nests; perform predator control when necessary

Current Monitoring & Inventory Programs (Appendix E):

Nesting surveys
 International Piping Plover Census; conducted at approximately 5-year intervals

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Continue nesting surveys and evaluation of responses to annual available habitat
 Update National Wetlands Inventory maps
 Identify high-quality stopover habitat

South Dakota Wildlife Action Plan

Existing Recovery Plans/Conservation Strategies:

1) United States Fish and Wildlife Service. 2001. Draft environmental assessment: proposal of critical habitat for northern Great Plains breeding population of piping plovers (*Charadrius melodus*). Ecological Services, Pierre, South Dakota, USA; 2) South Dakota Game, Fish and Parks. 2005. Interior Least Tern (*Sterna antillarum athalassos*) and Piping Plover (*Charadrius melodus*) Management Plan. SDGFP, Wildlife Division Report 2005-02, Pierre, SD.

South Dakota Wildlife Action Plan

Ruffed Grouse

RUGR

Bonasa umbellus

Description:

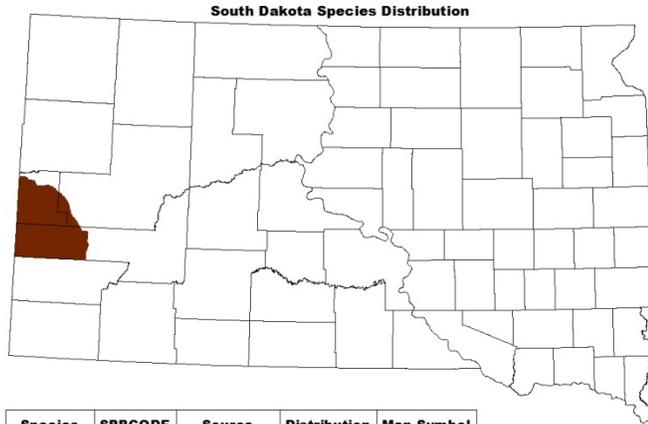
Brown, reddish brown or gray-brown grouse with barred sides; tail fan-shaped, with black band near tip.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Ruffed Grouse	RUGR	SDBBA & SDGFP	Year Round	

Key Habitat:

Dependent on a mix of multiple age-classes of aspen for food and cover; may also use hardwoods and open pine forests.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: pesticides; overhunting

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey
 Occasional spring surveys

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Habitat surveys of Black Hills meadows, aspen and conifers
 Monitor long-term population trends
 Wildlife response to mountain pine beetle infestation

Existing Recovery Plans/Conservation Strategies:

Wiggins, D.A. 2006. Ruffed Grouse (*Bonasa umbellus*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/ruffedgrouse.pdf> [06/12/2012].

South Dakota Wildlife Action Plan

Sprague's Pipit

SPPI

Anthus spragueii

Description:

Pale, slender, sparrow-sized bird with white outer tail feathers, a thin bill, pale legs, and streaked back.

Protection Status:

Federal: Candidate
 State: None

Distribution:

This species is believed to have historically had breeding populations in habitat found in MLRAs 53B, 53C, 58D, 54, and northern portions of 60A, 63A, and 63B. Migratory populations may have occurred statewide. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Sprague Pipit	SPPI	SDBBA & SDNHD	Summer	
		Birds of SD	Migration	

Key Habitat:

Prefers lightly to moderately grazed short-grass ecosystems with low to moderate levels of litter; also prefers short-grass ecosystems several years post-burn.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5; woody plant encroachment; habitat fragmentation

Non-habitat: reduced productivity due to Brown-headed Cowbird parasitism; human disturbance during the nesting season

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop educational materials to reduce human disturbance in breeding/nesting habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Assess grassland habitats during migration and breeding season

Compare nest success between native and "tame" grasslands

Determine minimum size of habitat block needed

Existing Recovery Plans/Conservation Strategies:

Jones, S. L. 2010. Sprague's Pipit (*Anthus spragueii*) conservation plan. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C.

South Dakota Wildlife Action Plan

Trumpeter Swan

TRUS

Cygnus buccinator

Description:

Large, white swan.

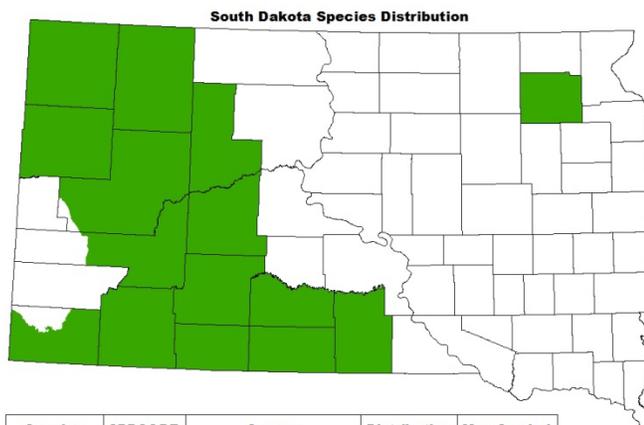
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Trumpeter Swan	TRUS	SDBBA, Birds of SD, & SDNHD	Summer	

Key Habitat:

Prefers shallow water ponds, rivers, and lakes with aquatic and emergent vegetation; nests constructed on an island, beaver lodge, or a mat of floating vegetation that consist of cattails, bulrushes, and horsetails.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: overcrowding contributes to disease outbreaks; severe winter weather; widely varying controlled water levels can flood nest sites; nest site disturbance from recreational use; pesticides/pollution; illegal shooting; sensitive to lead poisoning

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to educate the public on appropriate activities near nesting site; work with agencies, landowners, and industry to reduce water pollution and pesticide/herbicide use near habitat; develop programs and materials to educate hunters on critical identification features relative to other similar swan species; develop programs and materials to ensure public awareness of non-toxic shot regulations

Current Monitoring & Inventory Programs (Appendix E):

- North American Breeding Bird Survey
- Opportunistic nesting pair monitoring

SWG Accomplishments (Appendix F):

- South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

- Survey winter distribution and limits to that distribution
- Research impact of narrowleaf cattail and hybrid species on wetland birds

Existing Recovery Plans/Conservation Strategies:

Slater, G.L. 2006. Trumpeter Swan (*Cygnus buccinator*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/trumpeterswan.pdf>.

South Dakota Wildlife Action Plan

White-winged Junco

WWJU

Junco hyemalis aikeni

Description:

Subspecies of the dark-eyed junco with two white wingbars.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 60A, 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers coniferous and deciduous forest openings and edges; little information available.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: limited range and a general lack of information regarding this subspecies of junco

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: none

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Monitor general status through existing methods, such as SDBBA2, North American BBS and SDOU reporting

South Dakota Wildlife Action Plan

Whooping Crane

WHCR

Grus americana

Description:

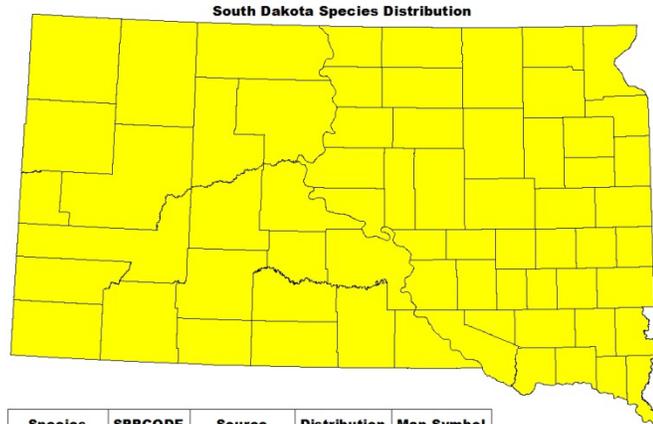
Very tall white bird with a long neck, long legs, and red facial skin.

Protection Status:

Federal: Endangered
State: Endangered

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Whooping Crane	WHCR	SDBBA & SDNHD	Migration	Yellow

Key Habitat:

Migration habitat includes marshes and submerged sandbars in rivers with good horizontal visibility, water depth of 12 in or less, and minimum wetland size of 0.1 ac for roosting.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
Non-habitat: collision with power lines; illegal shooting

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
Non-habitat: develop strategies to reduce the risk of collisions with utility lines; work with agencies, landowners, and industry to minimize detrimental activities to habitat; develop programs and materials to reduce illegal shooting; develop programs to protect staging/migrating birds

Current Monitoring & Inventory Programs (Appendix E):

Spring and fall migration monitoring

Priority Research & Monitoring Needs (Appendices G-K):

Update National Wetlands Inventory maps
Continue monitoring movements and associated habitat use of migrating whooping cranes
Monitor impacts of tile drainage

Existing Recovery Plans/Conservation Strategies:

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

South Dakota Wildlife Action Plan

Willet

WILL

Tringa semipalmata

Description:

Large, long-legged shorebird; gray above, white below and lightly barred on flanks.

Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Willet	WILL	SDBBA	Summer	
		Birds of SD	Migration	

Key Habitat:

Prefers shallow-water areas with short, sparse shoreline vegetation; nests on ground in short-grass or bare areas.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: human/pet disturbance of nest sites; nest depredation; loss of grasslands near nest sites

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to educate the public on limiting disturbance near nesting sites; work with agencies, landowners, and industry to reduce pesticide/herbicide use near habitat

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Update National Wetlands Inventory maps

Determine minimum size of habitat block needed

Monitor impacts of tile drainage

Existing Recovery Plans/Conservation Strategies:

Skagen, S.K., and G. Thompson. 2013 (updated). Northern Plains/Prairie Pothole Regional Shorebird Conservation Plan, Version 1.0, in United States Shorebird Conservation Plan.

South Dakota Wildlife Action Plan

Wilson's Phalarope

WIPH

Phalaropus tricolor

Description:

Shorebird similar to sandpipers but swims readily; white rump and dark wings.

Protection Status:

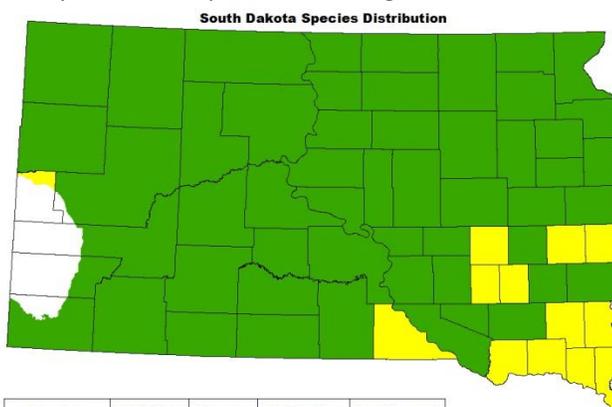
Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62.

See map at right for current distribution.



Key Habitat:

Prefers shallow marshes and wet meadows adjacent to intact upland grass ecosystems; dense nesting cover.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: nest depredation; loss of grasslands near nest site; human/pet/livestock disturbance of nest

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: control nest and chick predators; develop programs and educational materials to identify appropriate activities near nesting sites; develop strategies to reduce the risk of utility line collisions

Current Monitoring & Inventory Programs (Appendix E):

North American Breeding Bird Survey

SWG Accomplishments (Appendix F):

South Dakota Breeding Bird Atlas 2 (T-41)

Priority Research & Monitoring Needs (Appendices G-K):

Update National Wetlands Inventory maps

Monitor impacts of tile drainage

Identify high-quality stopover habitat

Existing Recovery Plans/Conservation Strategies:

- 1) Skagen, S.K., and G. Thompson. 2013 (updated). Northern Plains/Prairie Pothole Regional Shorebird Conservation Plan, Version 1.0, in United States Shorebird Conservation Plan; 2) Lesterhuis, A.J., and R.P. Clay. 2010. Conservation Plan for Wilson's Phalarope (*Phalaropus tricolor*) Version 1.1. Western Hemisphere Shorebird Reserve Network. 61 pp.

South Dakota Wildlife Action Plan

Black Hills Red Squirrel

BHSQ

Tamiasciurus hudsonicus dakotensis

Description:

Reddish-orange in color but with white on the belly and a ring of white fur around the eye.

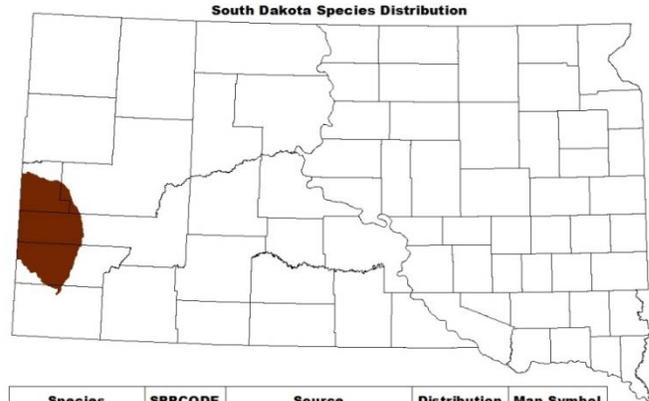
Protection

Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRA 62. See map at right for current distribution.



Key Habitat:

Prefers evergreen forest with components of late seral conditions; dens in large, old snags.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: timber harvest, mountain pine beetle, genetic diversity

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: none identified

SWG Accomplishments (Appendix F):

Natural history and genetic makeup of the northern flying squirrel population in the Black Hills and northeastern South Dakota (T14) (study of the Black Hills red squirrel was amended to this SWG project at a later date)

Priority Research & Monitoring Needs (Appendices G-K):

Monitor long term population trends
 Evaluate effects of timber harvest and mountain pine beetle to population dynamics and movements

South Dakota Wildlife Action Plan

Black-footed Ferret

BFFE

Mustela nigripes

Description:

Mink-sized, buff-colored weasel with a short furry tail, oval ears, and black points.

Protection Status:

Federal: Endangered

State: Endangered

Distribution:

This species was historically associated with prairie dog colonies and its distribution was therefore consistent with the distribution of prairie dogs in South Dakota. See map at right for current distribution.



Key Habitat:

Requires black-tailed prairie dog colonies; estimates of 100-150 acres of prairie dog colony are required to support one ferret.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: canine distemper; predation by coyotes and badgers; barriers to dispersal

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: Work with agencies and landowners to reduce the prevalence of canine distemper; develop predator control programs, where appropriate; develop captive breeding and reintroduction programs; and develop incentive programs for landowners who manage for habitat

Current Monitoring & Inventory Programs (Appendix E):

Monitoring success of reintroductions to establish self-sustaining populations (USFS, NPS, USFWS, Cheyenne River, Rosebud and Lower Brule Sioux Tribes)

Monitoring distribution and prevalence of sylvatic plague

SWG Accomplishments (Appendix F):

Understanding the relationship between prairie dog ecology and black-footed ferret resource selection (T-35)

Factors that affect territoriality and productivity of black-footed ferrets (T-38)

Priority Research & Monitoring Needs (Appendices G-K):

Determine the influence of predators and prey on black-footed ferret populations

Further understand the ecology of sylvatic plague

Evaluate and improve reintroduction methods including captive rearing, captive release, and translocation of wild animals

Evaluate and improve sylvatic plague mitigation methods including vaccination and insecticide application

Existing Recovery Plans/Conservation Strategies:

U.S. Fish and Wildlife Service. 2013. Recovery plan for the black-footed ferret (*Mustela nigripes*). U.S. Fish and Wildlife Service, Denver, Colorado. 130 pp. Available online:

http://ecos.fws.gov/docs/recovery_plan/Draft%20Revised%20BFF%20Recovery%20Plan_2013%20with%20RD%20signatures_1.pdf

South Dakota Wildlife Action Plan

Franklin's Ground Squirrel

FGSQ

Poliocitellus franklinii

Description:

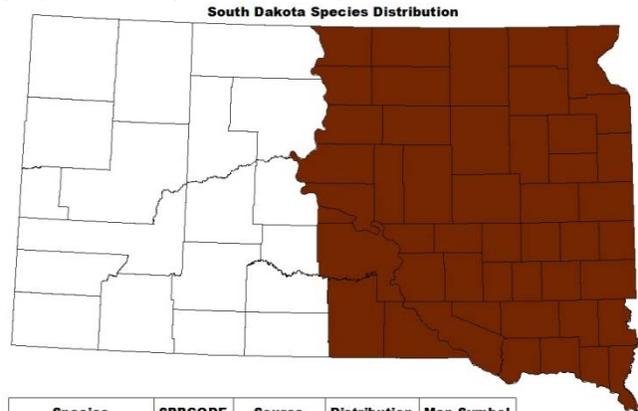
Large, burrowing ground squirrel with brownish gray back and yellowish rump.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in all MLRAs east of the Missouri River. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Franklins Ground Squirrel	FGSQ	Mammals of SD	Year Round	

Key Habitat:

Prefers tall- and mixed-grass native ecosystems with relatively dense, tall structure.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: conversion and fragmentation of mixed and tallgrass prairies, possible increased predation rates, poisoning

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and materials to reduce poisoning, shooting, and trapping

SWG Accomplishments (Appendix F):

Status and distribution of Franklin's and Richardson's ground squirrels in eastern South Dakota-T-53-R-1

Priority Research & Monitoring Needs (Appendices G-K):

Assess habitat use and requirements
 Monitor distribution and abundance to evaluate effects of native grassland alteration

South Dakota Wildlife Action Plan

Fringe-tailed Myotis

FTMY

Myotis thysanodes pahasapensis

Description:

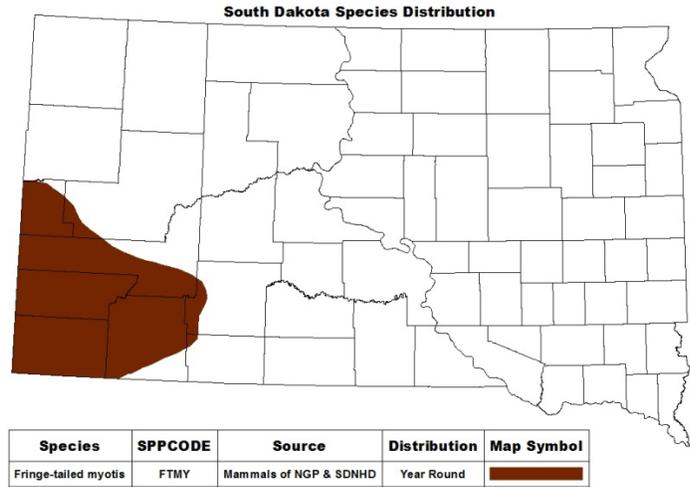
Medium sized, insectivorous bat with dark colored fur and long-ears.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61, 62, and 64 and may have also occurred in parts of 60A. See map at right for current distribution.



Key Habitat:

Prefers dry, coniferous forests, ponderosa pine, white spruce, and aspen at moderate elevations; roosts in loose bark on large snags, rock crevices (particularly in badlands), caves, mines, and buildings; forages over grass meadows, standing water and along watercourses.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: closure of abandoned mines and caves; human disturbance and vandalism of roost sites; pesticides to control mosquitoes and other prey items; white nose syndrome

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and materials to reduce human disturbance of roosting sites and hibernacula; work with agencies and landowners to reduce pesticide use to control important prey species; install bat-friendly gates at important cave and abandoned mine sites

Current Monitoring & Inventory Programs (Appendix E):

Monitoring status and trends of Black Hills bats (SDGFP, BatWorks, Wind Cave National Park)

SWG Accomplishments (Appendix F):

Bat habitat protection and evaluation: implementing and assessing management techniques-T15-R
 Assessment, monitoring, and protection of bat habitats in western South Dakota-T37-R
 Evaluation of artificial bat roost selection and occupancy in South Dakota-T2-8-R-1
 Preliminary investigations into migratory movements of bats in South Dakota-T49-R-1

Priority Research & Monitoring Needs (Appendices G-K):

Monitor progression of white-nose syndrome and for evidence at important hibernacula sites
 Research hibernacula, maternity and nursery roost requirements and availability
 Continue to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

1) South Dakota Bat Working Group. 2004. South Dakota bat management plan. Wildlife Division Report 2004-08. 89pp. Available online at: <http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx> 2) Tigner, J. and E.D. Stukel, 2003. Bats of the Black Hills: A Description of Status and Conservation Needs. South Dakota Department of Game, Fish and Parks. Wildlife Division Report 2003-05. Available online at: <http://gfp.sd.gov/wildlife/management/diversity/docs/battechreport.pdf>

South Dakota Wildlife Action Plan

Northern Flying Squirrel

NFSQ

Glaucomys sabrinus

Description:

Small, nocturnal squirrel gray in color with white belly and black rings around eyes

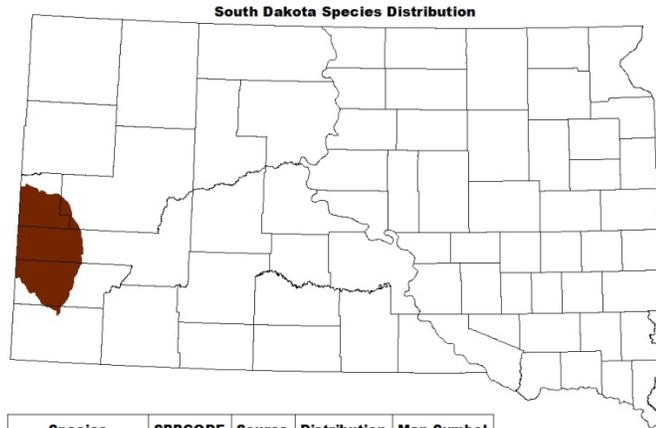
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Northern Flying Squirrel	NFSQ	SDNHD	Year Round	

Key Habitat:

Prefers relatively mature, contiguous mixed and coniferous forests of spruce, pine, aspen and other hardwoods; requires large trees or snags for nesting; prefers less dense overstory conditions for easy gliding.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: timber harvest, mountain pine beetle, genetic diversity

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: none identified

Current Monitoring & Inventory Programs (Appendix E):

South Dakota Natural Heritage Database

SWG Accomplishments (Appendix F):

Natural history and genetic makeup of the northern flying squirrel population in the Black Hills and northeastern South Dakota-T-14-R

Priority Research & Monitoring Needs (Appendices G-K):

Monitor long term population trends

Evaluate effects of timber harvest and mountain pine beetles to populations dynamics

Existing Recovery Plans/Conservation Strategies:

Austin, K., et al. No date. Northern flying squirrel draft recovery plan. U.S. Fish and Wildlife Service Region 5. 52 pp.

South Dakota Wildlife Action Plan

Northern Myotis

NOMY

Myotis septentrionalis

Description:

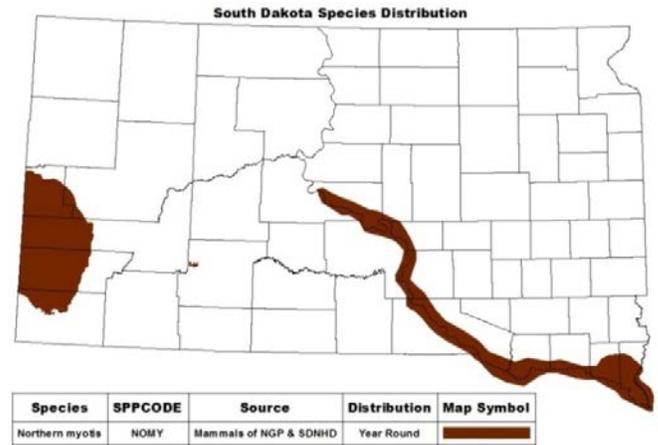
Small, insectivorous bat with light to dark brown fur, buffy shoulder patch and long-ears.

Protection Status:

Federal: Threatened
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 60A, 61, 62, and 64. See map at right for current distribution.



Key Habitat:

Typically found near water and dense forest conditions, both coniferous and riparian; roost sites consist of exfoliating bark and tree cavities, open buildings, and caves or mines; winter hibernacula are frequently caves and mines.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: closure of mines and caves; human disturbance of roosting sites and hibernacula; pesticides to control mosquitos and other prey items; white nose syndrome

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and materials to reduce human disturbance of roosting sites and hibernacula; work with agencies and landowners to reduce the use of pesticides to control important prey species; install bat-friendly gates at important cave and abandoned mine sites

Current Monitoring & Inventory Programs (Appendix E):

Monitoring status and trends of Black Hills bats (SDGFP, BatWorks, Wind Cave National Park)

SWG Accomplishments (Appendix F):

Bat habitat protection and evaluation: implementing and assessing management techniques (T-15)
 Assessment, monitoring, and protection of bat habitats in western South Dakota (T-37)
 Evaluation of artificial bat roost selection and occupancy in South Dakota (T2-8)
 Preliminary investigations into migratory movements of bats in South Dakota (T-49)

Priority Research & Monitoring Needs (Appendices G-K):

Research hibernacula, maternity and nursery roost requirements and availability
 Monitor progression of white-nose syndrome and for evidence at important hibernacula sites
 Continue to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

- 1) South Dakota Bat Working Group. 2004. South Dakota bat management plan. Wildlife Division Report 2004-08. 89pp. Available online at: <http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx>
- 2) Tigner, J. and E.D. Stukel. 2003. Bats of the Black Hills: A Description of Status and Conservation Needs. South Dakota Department of Game, Fish and Parks. Wildlife Division Report 2003-05. Available online at: <http://gfp.sd.gov/wildlife/management/diversity/docs/battechreport.pdf>

South Dakota Wildlife Action Plan

Northern River Otter

NROT

Lontra canadensis

Description:

Large, dark brown "weasel" with long, slender body; long, thick, tapering tail; webbed feet.

Protection Status:

Federal: None

State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
River Otter	NROT	SDGFP	Year Round	

Key Habitat:

Prefers slow-moving rivers and streams with deep pools, abundant riparian vegetation, and plentiful fish; often associated with beaver activity.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: reduced prey populations; road mortality; diseases such as distemper, rabies, etc.

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop strategies to reduce mortality by lethal beaver traps; work with agencies and landowners to reduce the prevalence of canine distemper and rabies in habitat; develop programs and materials to reduce illegal shooting

Current Monitoring & Inventory Programs (Appendix E):

Monitoring river otter occurrence and distribution (SDGDP, SDSU)

Priority Research and Monitoring Needs (Appendix F):

Update knowledge of river otter distribution in South Dakota

Determine life history characteristics

Determine cause of mortality and reproductive status

SWG Accomplishments (Appendices G-K):

Determination of river otter distribution and evaluation of potential sites for population expansion in South Dakota (T-55)

Existing Recovery Plans/Conservation Strategies:

South Dakota Department of Game, Fish and Parks. 2012. South Dakota River Otter Management Plan. South Dakota Department of Game, Fish and Parks Wildlife Division Report Number 2012-07, Pierre, South Dakota, USA.

South Dakota Wildlife Action Plan

Richardson's Ground Squirrel

RGSQ

Urocitellus richardsonii

Description:

Medium-sized ground squirrel of relatively uniform coloration; buffy yellow to grayish in color.

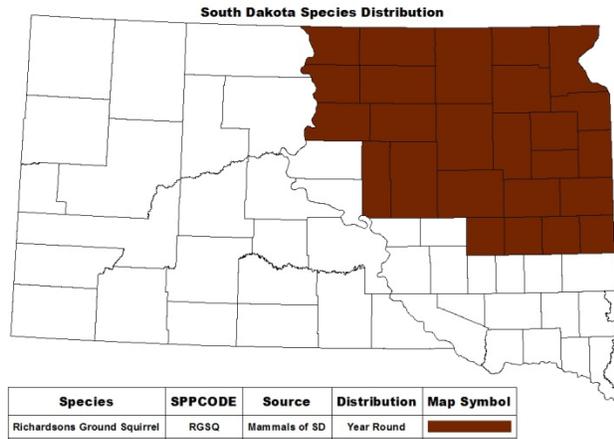
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 53B, 55B, 56, 102A and the northern portions of 53C, 55C, 102B, and 102C. See map at right for current distribution.



Key Habitat:

Prefers relatively flat to gently rolling, short-statured grassland ecosystems .

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: mortality due to poisoning, shooting, or trapping

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to reduce poisoning, shooting, and trapping

SWG Accomplishments (Appendix F):

Status and distribution of Franklin's and Richardson's ground squirrels in eastern South Dakota(T-53)

Priority Research & Monitoring Needs (Appendices G-K):

Monitor distribution and long-term trends in populations

Research factors influencing distributional changes in South Dakota

South Dakota Wildlife Action Plan

Silver-haired Bat

SHBA

Lasionycteris noctivagans

Description:

Medium sized, densely furred bat; nearly black, with silvery-tipped hairs on back, giving frosted appearance.

Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Silver-haired bat	SHBA	Mammals of NGP & SDNHD	Summer	

Key Habitat:

Prefers late successional forest with high concentrations of standing dead trees, some of which have exfoliating bark, cracks in the wood, and cavities excavated by birds.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: white nose syndrome; human disturbance, pesticides to control mosquitoes and other prey items

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide use to control important prey species

Current Monitoring & Inventory Programs (Appendix E):

Monitoring status and trends of Black Hills bats (SDGFP, BatWorks, Wind Cave National Park)

SWG Accomplishments (Appendix F):

Bat habitat protection and evaluation: implementing and assessing management techniques (T-15)

Assessment, monitoring, and protection of bat habitats in western South Dakota (T-37)

Evaluation of artificial bat roost selection and occupancy in South Dakota (T2-8)

Preliminary investigations into migratory movements of bats in South Dakota (T-49)

Priority Research & Monitoring Needs (Appendices G-K):

Determine the effects of wind power generation sites on migratory bat populations

Census bats along riparian corridors to understand the value of these habitats for foraging and roosting and as migration routes

Continue to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

1) Schmidt, C.A. 2003. Conservation assessment for the Silver-Haired Bat in the Black Hills of South Dakota and Wyoming. USDA Forest Service Rocky Mountain Region, Custer, South Dakota. 22 pp.

2) South Dakota Bat Working Group. 2004. South Dakota bat management plan. Wildlife Division Report 2004-08. 89pp. Available online at: <http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx>

3) Tigner, J. and E.D. Stukel, 2003. Bats of the Black Hills: A Description of Status and Conservation Needs. SDGFP. Wildlife Division Report 2003-05. Available online at: <http://gfp.sd.gov/wildlife/management/diversity/docs/battechreport.pdf>

South Dakota Wildlife Action Plan

Swift Fox

SWFO

Vulpes velox

Description:

Small fox with a black-tipped tail.

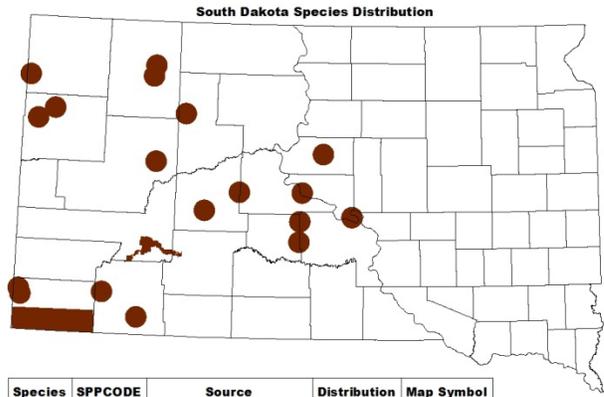
Protection

Status:

Federal: None
 State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Key Habitat:

Prefers heavily grazed shortgrass or mixed-grass prairies with open gently rolling topography for high visibility of surrounding area; usually associated with prairie dogs or ground squirrel colonies.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: predation and interspecific competition with coyotes and red fox; canine distemper; susceptible to shooting, trapping, and poisoning; vehicle collisions

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop programs and educational materials to reduce poisoning, shooting, and trapping; develop strategies to reduce vehicle injury/mortality; vaccinate for canine-distemper when live-trapped and handled; develop reintroduction programs for suitable habitat; control predators (e.g., coyotes)

Current Monitoring & Inventory Programs (Appendix E):

Monitor success of reintroductions to establish self-sustaining populations (Badlands National Park)

SWG Accomplishments (Appendix F):

Restoring swift foxes to the Bad River Ranches and environs in western South Dakota (T-25)

Priority Research & Monitoring Needs (Appendices G-K):

- Map remaining native prairie on a recurring basis
- Assess quality of untilled prairie
- Determine the requirements of intact habitat blocks for swift fox in South Dakota

Existing Recovery Plans/Conservation Strategies:

Dowd Stukel, E., ed. 2011. Conservation assessment and conservation strategy for swift fox in the United States – 2011 Update. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota. U.S.A.

South Dakota Wildlife Action Plan

Townsend's Big-eared Bat

TBBA

Corynorhinus townsendii

Description:

Large, insectivorous bat with buff colored fur on back and pale buff on the belly.

Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs west of the Missouri River. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Townsend's Big-eared Bat	TBBA	Mammals of NGP & SDNHD	Year Round	

Key Habitat:

Forages over sagebrush-grasslands, riparian areas, and open pine/coniferous forests; caves, mines, rocky outcrops, natural caves, and abandoned mines are preferred for roosting and hibernacula.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: closure of caves and mines; disturbance and vandalism to roost sites and hibernacula; white nose syndrome

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and educational materials to reduce human disturbance of roosting sites and hibernacula; install bat-friendly gates at important cave and abandoned mine sites

Current Monitoring & Inventory Programs (Appendix E):

Monitoring status and trends of Black Hills bats (SDGFP, BatWorks, Wind Cave National Park)

SWG Accomplishments (Appendix F):

Bat habitat protection and evaluation: implementing and assessing management techniques (T-15)

Assessment, monitoring, and protection of bat habitats in western South Dakota (T-37)

Evaluation of artificial bat roost selection and occupancy in South Dakota (T2-8)

Preliminary investigations into migratory movements of bats in South Dakota (T-49)

Priority Research and Monitoring Needs (Appendices G-K):

Identify and protect important maternity roosts, nursery roosts, and hibernacula

Determine the effective size of buffer zones needed around occupied caves and/or mines that serve as hibernacula and maternity roosts

Continue to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

1) South Dakota Bat Working Group. 2004. South Dakota bat management plan. Wildlife Division Report 2004-08. 89pp. Available online at: <http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx>

2) Tigner, J. and E.D. Stukel, 2003. Bats of the Black Hills: A Description of Status and Conservation Needs. South Dakota Department of Game, Fish and Parks. Wildlife Division Report 2003-05. Available online at:

<http://gfp.sd.gov/wildlife/management/diversity/docs/battechreport.pdf>

South Dakota Wildlife Action Plan

Black Hills Redbelly Snake

BHRS

Storeria occipitomaculata pahasapae

Description:

Small woodland snake that is gray or reddish brown and four narrow dark stripes on its back and one pale stripe down middle.

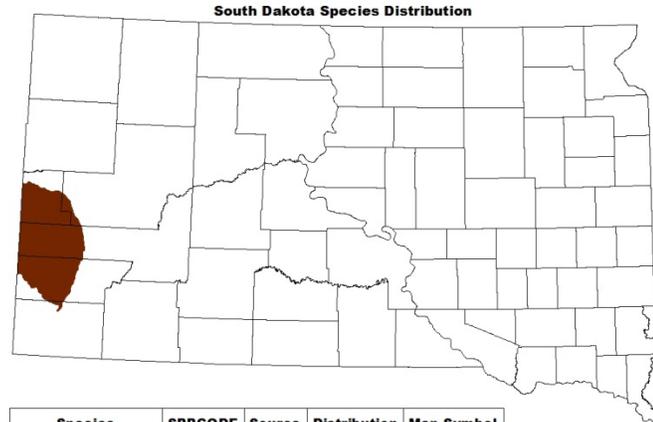
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRA 62 and possibly 61. See the map at right for current distribution.



Key Habitat:

Prefers deciduous and mixed woodlands; damp, moist, and cool environments of riparian/wetland ecosystems; hides under bark, logs, rocks, and leaf litter.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: road mortality during migrations to and from their hibernacula

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and educational materials to reduce road mortality during migration periods

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Ecology of the Black Hills redbelly snake (*Storeria occipitomaculata pahasapae*) with emphasis on food habits (T-7)

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Characterize habitat features of snake hibernacula via GIS modeling; survey such habitat

Characterize important foraging habitat through niche modeling

Study effects of grazing on mesic meadows at higher elevations in the Black Hills

Participate in identification of PARCAs through regional PARC chapters

Existing Recovery Plans/Conservation Strategies:

Smith, B.E. and N.T. Stephens. 2003. Conservation Assessment for the Redbelly Snake in the Black Hills National Forest South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region. 18 pp.

South Dakota Wildlife Action Plan

Blanchard's Cricket Frog

BCFR

Acris blanchardi

Description:

Small, semi-aquatic, brown-gray frog with a "warty" appearance and pointed snout.

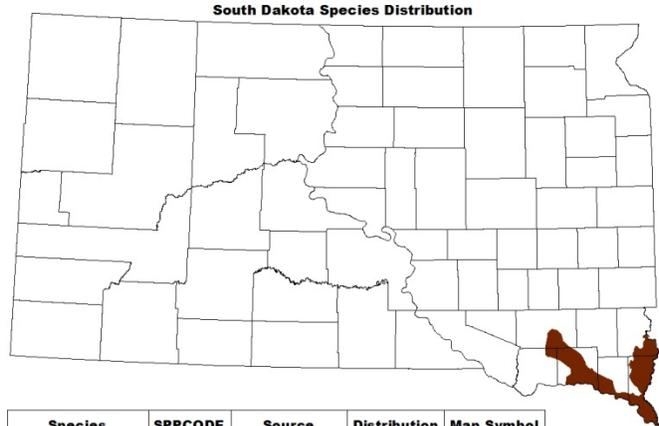
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 102B and 102C and portions of 55C, 63A, and 63B. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Blanchards Cricket Frog	BCFR	SDNHD & SD Herps	Year Round	

Key Habitat:

Prefers margins of permanent marshes, wet meadows, fens, lakes, and slow moving streams and rivers; narrow mud flats and stream banks with abundant, low emergent vegetation preferred.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: predation by non-native species; water pollution caused by pesticides/herbicides and other pollutant; chytrid fungus; overwintering mortality

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat; control non-native predators on this species

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Investigate prevalence of ranavirus; establish monitoring program to detect new occurrences

Analyze contaminant loads in wetlands

Monitor to determine long-term status and trends

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Cope's Gray Treefrog

CGTR

Hyla chrysoscelis

Description:

Tree frog with yellow inner thigh markings on underside and solid lime green on the back during breeding season.

Protection Status:

Federal: None
 State: None

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in parts of MLRAs 55C, 63A, 63B, 102A, 102B, and 102C. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Copes Gray Treefrog	CGTR	SDNHD	Year Round	

Key Habitat:

Prefers wooded areas and woodland edges, usually within a few hundred meters of water; recently disturbed areas with abundant shrubs, herbaceous growth, and vines; both arboreal and terrestrial; eggs are laid and larvae develop in temporary or permanent waters of flooded puddles, river sloughs, creeks, and small ponds, where there are woody branches or extensive herbaceous growth along the edges.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: pesticide application; predation by non-native species; introduction of fish into formerly fishless areas

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies and landowners to reduce levels of pesticide use in habitat; develop programs to reduce or eliminate the presence of fish in formerly fishless habitat; develop strategies to limit predation by non-native species

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)
 Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Investigate prevalence of ranavirus; establish monitoring program to detect new occurrences
 Analyze contaminant levels in wetlands
 Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Eastern Hognose Snake

EHSN

Heterodon platirhinos

Description:

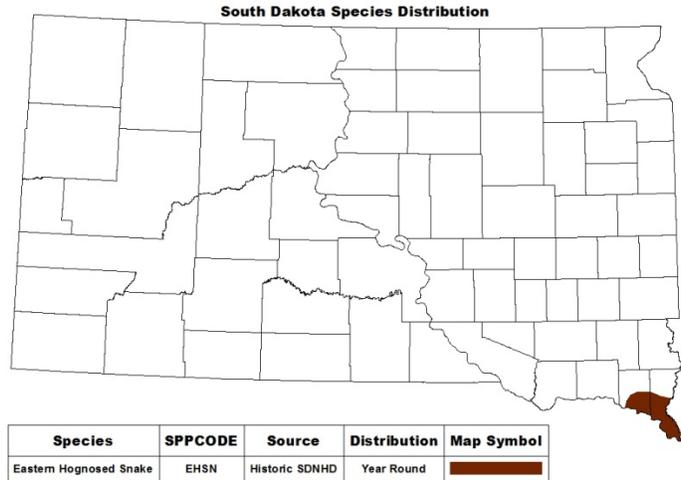
Medium-sized, harmless snake with a heavy body and an upturned snout; variable colors include tan, yellow, and brown.

Protection Status:

Federal: None
State: Threatened

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in those portions of MLRAs 55C, 63B, 66, 102B, and 102C associated with the Missouri River. SD is the northwestern fringe of the historical range for this species. See map at right for current distribution.



Key Habitat:

Typically found in sandy floodplains of rivers and streams, sandy shorelines, and sandy upland grasslands; must have an abundant supply of toads and other small amphibians to sustain adults and young

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: destruction/disturbance of sand dune habitat by recreationists; commercial and recreational development; pesticides/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and materials to educate the public on appropriate activities near habitat; work with agencies and landowners to reduce pesticide and herbicide use near habitat and to maintain open vegetative cover

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for SD Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Characterize habitat features of snake hibernacula via GIS modeling; survey such habitat
Collect genetic data to determine genetic variation among South Dakota populations and compared to populations elsewhere

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

False Map Turtle

FMTU

Graptemys pseudogeographica

Description:

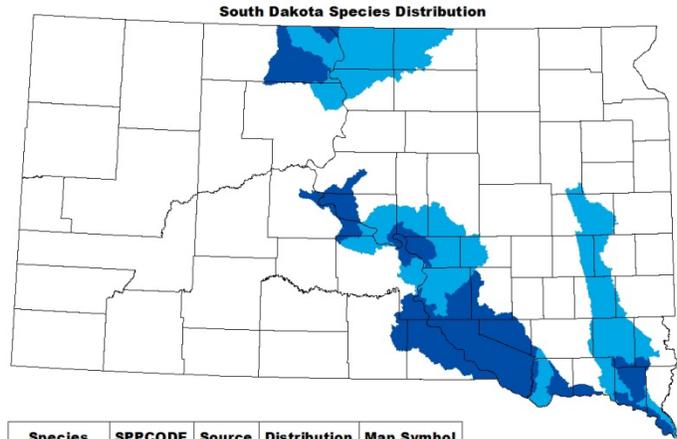
Medium, freshwater turtle; brown carapace with middorsal keel and subtle knobs, light spec/line behind eye.

Protection Status:

Federal: None
 State: Threatened

Distribution:

This species is believed to have historically occurred in appropriate habitat found in the Missouri River system. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
False Map Turtle	FMTU	SDNHD	Confirmed	
			Probable	

Key Habitat:

Lakes, ponds, reservoirs, sloughs, rivers and their backwaters; areas with abundant aquatic vegetation; deadwood for basking sites surrounded by deep water; lay eggs in nests dug in sandbars, islands, and beaches; may nest up to about 300 ft from water, but usually close to water.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: water pollution; herbicide/pesticide use; removal of basking sites (deadwood); nest disturbance by recreationists; unlawful shooting; nest depredation; bank stabilization

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies, landowners, and industry to maintain water quality by reducing soil erosion and reducing chemical use near habitat; maintain stable water levels in nesting colonies during nesting season; develop educational programs and post signs to protect nesting sites from disturbance.

Current Monitoring & Inventory Programs (Appendix E):

Monitoring in Missouri National Recreational River

SWG Accomplishments (Appendix F):

Population estimates, habitat relationships, and movement patterns of turtles, with an emphasis on the false map turtle and the smooth softshell in southeastern SD (T-30)
 Herpetology surveys for SD Comprehensive Wildlife Conservation Plan (T-8)
 Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Survey Missouri River populations from Pierre to North Dakota border
 Examine scope of aquatic turtle mortality as by-catch in fish traps
 Identify key nesting beaches along the Missouri River for potential protective measures
 Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Lesser Earless Lizard

LELI

Holbrookia maculata

Description:

Small gray to brownish lizard; lengthwise rows of dark blotches separated by pale stripe down center of back.

Protection Status:

Federal: None
 State: None

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in MLRAs 65, 66, and parts of MLRA 64. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Lesser Earless Lizard	LELI	Historic & Current SDNHD	Year Round	

Key Habitat:

Prefers sandhills; sandy or gravelly areas along streams; sparsely vegetated or short-statured grass ecosystems; prairie dog towns.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: control of prairie dog populations impact this species

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies and landowners to reduce the use of pesticides and poisons to control burrowing mammals

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)
 Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Continue opportunistic data collection through Natural Heritage Program
 Establish population monitoring system
 Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Lined Snake

LISN

Tropidoclonion lineatum

Description:

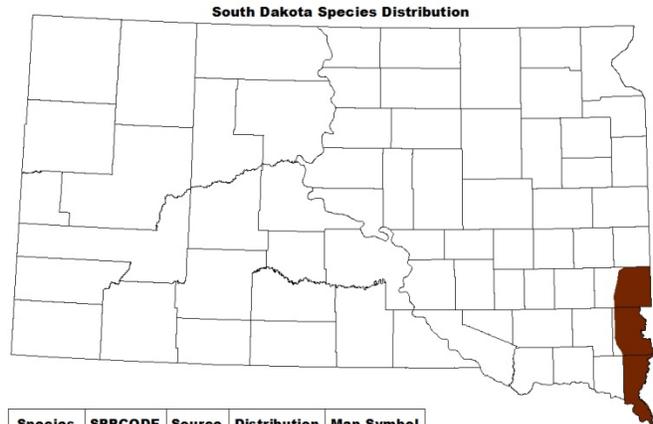
Small snake resembling the garter snake; variable colored with light stripes running down the back and sides.

Protection Status:

Federal: None
State: Endangered

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in portions of MLRAs 102B and 102C. See map at right for current distribution.



Key Habitat:

Prefers open, grassy prairies with rich soils and sparsely wooded areas; often found on hillsides near rocky areas.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
Non-habitat: road mortality

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
Non-habitat: investigate methods to provide or enhance travel corridors in highly-developed areas; develop programs and materials to educate the public on appropriate activities near habitat

Current Monitoring & Inventory (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)
Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring (Appendices G-K):

Characterize habitat features of snake hibernacula via GIS modeling; survey such habitat
Analyze contaminant loads
Identify areas of high road mortality and design measures to minimize loss
Conduct mark-recapture study to track population densities through time
Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Many-lined Skink

MLSK

Plestiodon multivirgatus

Description:

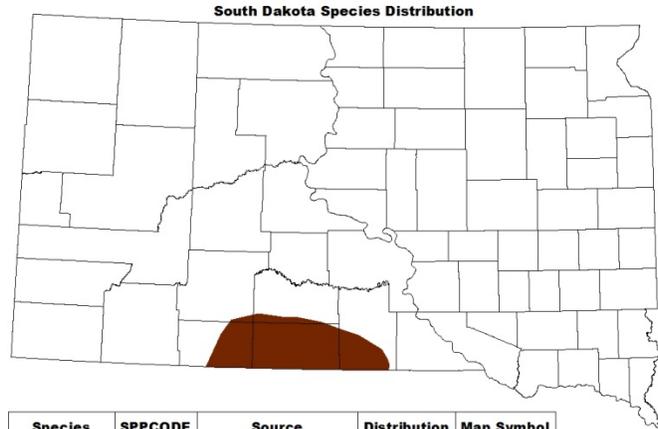
Long-bodied skink, with many alternating light and dark stripes.

Protection Status:

Federal: None
 State: None

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in 65 and 66, as well as portions of 64. See map at right for current distribution.



Key Habitat:

Prefers areas of loose sandy soil and prairie dog towns; often found beneath rocks or logs; sandhills and open plains habitats of Great Plains.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: control of prairie dog populations impact this species

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies and landowners to reduce the use of pesticides and poisons to control burrowing mammals

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)
 Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Conduct pitfall trap and visual surveys in areas of sandy soils in western and southcentral SD
 Collect genetic data to evaluate population distinctiveness
 Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Sagebrush Lizard

SALI

Sceloporus graciosus

Description:

Small lizard; gray or brown above and black bar on the shoulder; rust color on sides of the neck and body more pronounced in females; blue belly/throat patches more pronounced in males.

Protection

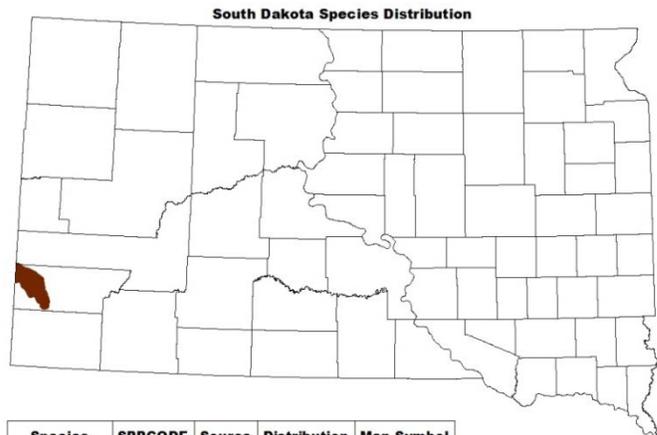
Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in only a small portion of MLRAs 60A and 61, near the western state boundary. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Sagebrush Lizard	SALI	SDNHD	Year Round	

Key Habitat:

Prefers sandier sites with relatively sparse vegetation or blowouts and a small percentage of sagebrush or other shrub cover; avoids areas with loamier soils.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: a general lack of information regarding this species

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: None

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Characterize important foraging habitats via niche modeling

Map, characterize and monitor sagebrush habitat

Determine effect of livestock grazing on sagebrush

Collect genetic data to determine risk of low genetic variation

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Short-horned Lizard

SHLI

Phrynosoma hernandesi

Description:

Small, flat, broad-bodied, brown to gray lizard with a short tail; spiny back and short spiny horns on the rear of head.

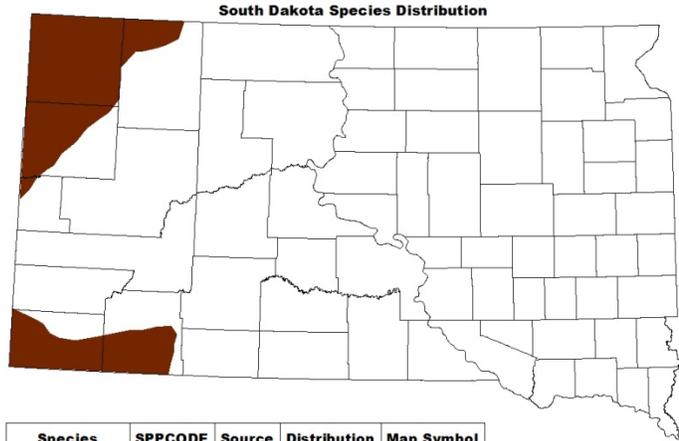
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs west of the Missouri River, except MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers short-statured grass ecosystems, sagebrush; sparse vegetation at ground level and easy access to sunlight are among the most important habitat features; prairie dog burrows are used for shelters and foraging.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: off-road recreational vehicle traffic and increased traffic associated with road building to oil and gas developments; use of insecticides could affect the food supply; pet trade

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and the public to reduce recreational use within habitat; develop programs to reduce the use of insecticides to control insects (prey)

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Analyze contaminant loads

Characterize important foraging habitats via niche modeling

Continue surveys using predictive ecological niche modeling to identify appropriate search areas

Collect genetic data to determine risk of low genetic variation

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Smooth Softshell

SMSO

Apalone mutica

Description:

Turtle recognized by its long pointed snout and heavily webbed feet.

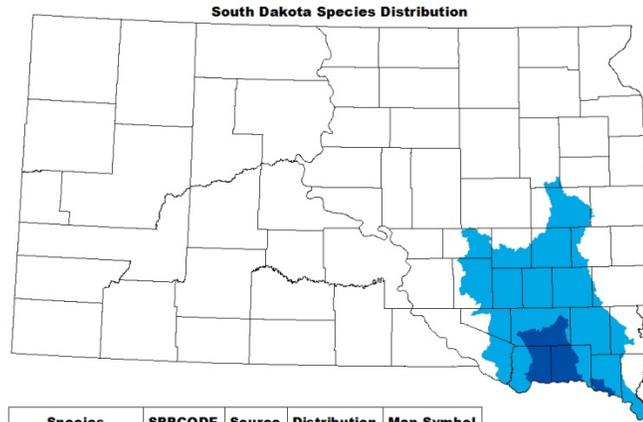
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in habitat found state-wide in South Dakota, except MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Smooth Softshell Turtle	SSTU	SDNHD	Confirmed	
			Probable	

Key Habitat:

Prefers rivers and large streams with moderate to fast current, and, lakes with sandy or muddy bottoms and few aquatic plants; lakes are near or part of a large river; sandbars important for basking and egg laying sites.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: removal of basking sites (e.g., deadwood); herbicide and pesticide use; nest disturbance by recreationists; nest depredation; bank stabilization

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce levels of water pollution in habitat; develop programs to educate the public on recreational impacts to habitat

Current Monitoring & Inventory Programs (Appendix E):

Monitoring along lower Missouri River

SWG Accomplishments (Appendix F):

Population estimates, habitat relationships, and movement patterns of turtles, with an emphasis on the false map turtle and the smooth softshell in southeastern SD (T-30)

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Survey rivers in northern and western South Dakota

Identify key nesting beaches along Missouri River for potential protective measures

Examine scope of aquatic turtle mortality as by catch in fish traps

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

Western (Ornate) Box Turtle

WBTU

Terrapene ornata

Description:

Turtle with dark brown or black shell and bright yellow lines that radiate to form a star burst pattern.

Protection Status:

Federal: None

State: None

Distribution:

This species is on the fringe of its range and is believed to have historically occurred in appropriate habitat found in MLRAs 64, 65, and 66 as well as the southern portions of 63A, 63B, 60A, 102B, and 102C. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Western Box Turtle	WBTU	SDNHD	Year Round	

Key Habitat:

Prefers sandhills and short-statured grass ecosystems; requires deep sandy soil to burrow into for hibernation in the winter; burrows into soil (e.g., under plants such as yucca) or enters burrows made by other species such as prairie dogs.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: road mortality; pet trade; ranavirus

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: develop programs and educational materials to reduce road mortality, e.g., place warning signs in frequently traveled routes and develop culverts to assist road crossing; monitor and assess the risk of pet trading.

Current Monitoring & Inventory Program (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Distribution, abundance, and seasonal habitat use patterns in ornate box turtles in SD (T-44)

Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan (T-8)

Threats, management, and suggested harvest and collection policy of herpetofauna of SD (T-57)

Priority Research & Monitoring Needs (Appendices G-K):

Map and assess quality of remaining prairie on a recurring basis

Survey potentially occupied sites identified in Higa et al. 2012 study

Participate in identification of PARCAs through regional PARC chapters

South Dakota Wildlife Action Plan

American Burying Beetle

AMBE

Nicrophorus americanus

Description:

Large, shiny, black burying beetle with orange patches on wings and head.

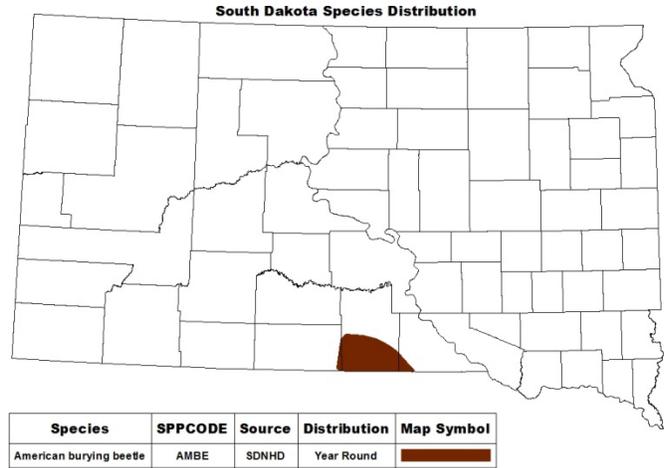
Protection Status:

Federal: Endangered

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the possible exception of MLRA 62. Today, it is only known to occur in a small portion of its previous range - see current distribution map at right.



Key Habitat:

Believed to be a habitat generalist as long as there are abundant carrion sources. However, it has been found to be positively correlated with little bluestem mixed prairies, disturbed grasslands, and fine sandy loams that are well-drained and at least moderately permeable. It is typically negatively correlated with forests, bottomland habitat, clays, and silt loams. Habitat areas must be large enough to allow sufficient distance for movements in search of carrion and mates (e.g., may move as far as 2 miles in 24 hours). A small area of potential habitat is not expected to support a population long term.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: population declines for this species are poorly understood at this time but some suggestions includes carcass reduction/limitations, pesticide use, disease, light pollution, or a combination of these factors

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use and excessive light pollution in habitat

Current Monitoring & Inventory Programs (Appendix E):

Population surveys

SWG Accomplishments (Appendix F):

Monitoring the American burying beetle in South Dakota (T-17A)

Priority Research & Monitoring Needs (Appendices G-K):

Periodically survey occupied areas to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

U.S. Fish and Wildlife Service. 1991. American burying beetle (*Nicrophorus americanus*) recovery plan. Newton Corner, MA 80pp.

South Dakota Wildlife Action Plan

Dakota Skipper

DASK

Hesperia dacotae

Description:

Small butterfly; males are tawny orange above; females are pale grayish brown above.

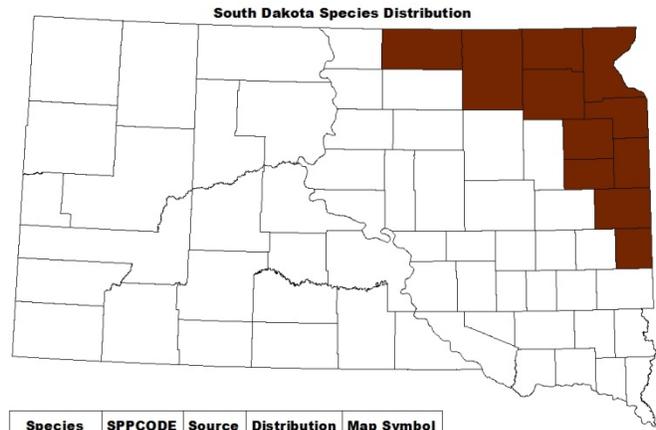
Protection Status:

Federal: Threatened

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRA's east of the Missouri River. See map at right for current distribution.



Key Habitat:

Typically found in gravelly, calcareous, alkaline, dry to moist light to moderately grazed grass ecosystems; larvae feed on little bluestem; alkali grass may be a reliable indicator of habitat

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: poorly timed prescribed fire that results in direct mortality; poorly timed mowing/haying/grazing; and pesticide/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Population surveys

SWG Accomplishments (Appendix F):

Monitoring of butterfly species of concern in South Dakota (T-17B)

Mapping and characterization of native grassland habitats on South Dakota's prairie coteau (T-54)

Priority Research & Monitoring Needs (Appendices G-K):

Continue population monitoring

Map and assess quality of remaining prairie on a recurring basis

Continue participation in captive propagation and reintroduction efforts

Existing Recovery Plans/Conservation Strategies:

Delphney, P. 2003. Summary of threats and conservation guidelines: Dakota skipper *Hesperia dacotae* (Skinner). U.S. Fish and Wildlife Service, Twin Cities Field Office. 34 pp

South Dakota Wildlife Action Plan

Great Plains Tiger Beetle

GPTB

Amblycheila cylindriformis

Description:

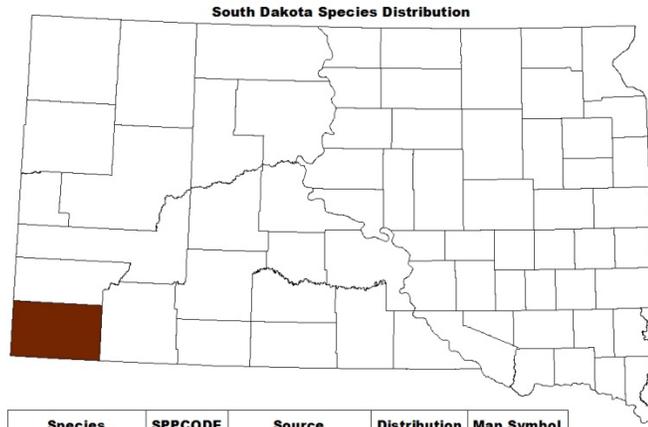
Largest North American tiger beetle; dark reddish brown to black in coloration.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 60A, 61, and portions of MLRA 64. See map at right for current distribution.



Key Habitat:

Eroded gullies, dissected loess, and clay hill banks that are located in sagebrush or short-statured grass ecosystems; in South Dakota, restricted to sand sage prairie.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: none identified

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: none identified

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

Priority Research & Monitoring Needs (Appendices G-K):

Population surveys

South Dakota Wildlife Action Plan

Indian Creek Tiger Beetle

ICTB

Cicindela nevadica makosika

Description:

Coppery beetle with pronounced white spots; head coppery with greenish reflections especially along edges of eyes.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRA 60A and possibly MLRA 64. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Indian Creek tiger beetle	ICTB	Tiger Beetles of SD & NE	Year Round	

Key Habitat:

Lower Indian Creek, an intermittent stream with above average salinity, where portions of the streambed consist of a light colored, viscous mud overlying Pierre shale.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: concentrated herds of cattle impact habitat

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with landowners to reduce cattle concentrations in habitat

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

Priority Research & Monitoring Needs (Appendices G-K):

Continued population monitoring; locate larvae and adults

South Dakota Wildlife Action Plan

Iowa Skipper

IOSK

Atrytone arogos iowa

Description:

Butterfly with yellow-orange upperside and black wing borders.

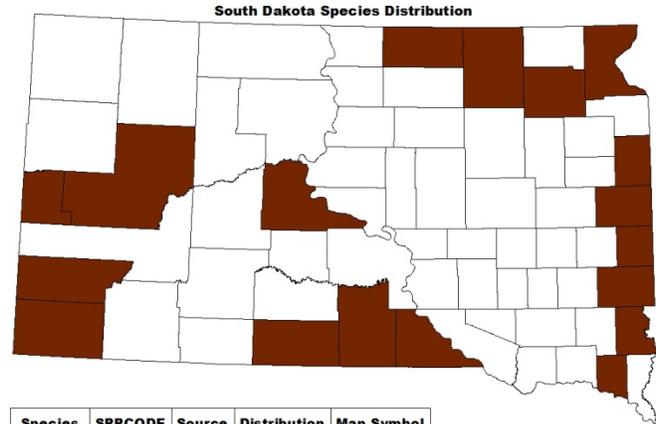
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers a range of short-statured to tall-statured native grass ecosystems; larval host plants include big bluestem, little bluestem, and sideoats grama; adult nectaring sources include yellow prickly pear, milkweeds, coneflowers, and wavy-leaf thistle.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: poorly timed prescribed fire that results in direct mortality; poorly timed mowing/haying/grazing; pesticide/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat.

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Monitoring butterfly species of concern in South Dakota (T-17B)

Priority Research & Monitoring Needs (Appendices G-K):

Map and assess quality of remaining native prairie on a recurring basis

Population surveys

Existing Recovery Plans/Conservation Strategies:

Moffat, M. and N. McPhillips. 1993. Management for butterflies in the northern Great Plains: a literature review and guidebook for land managers. U.S. Fish and Wildlife Service, Ecological Services, S.D. Field Office, 420 South Garfield Ave., Suite 400, Pierre, SD 57501-5408.

South Dakota Wildlife Action Plan

Little White Tiger Beetle

LWTB

Cicindela lepida

Description:

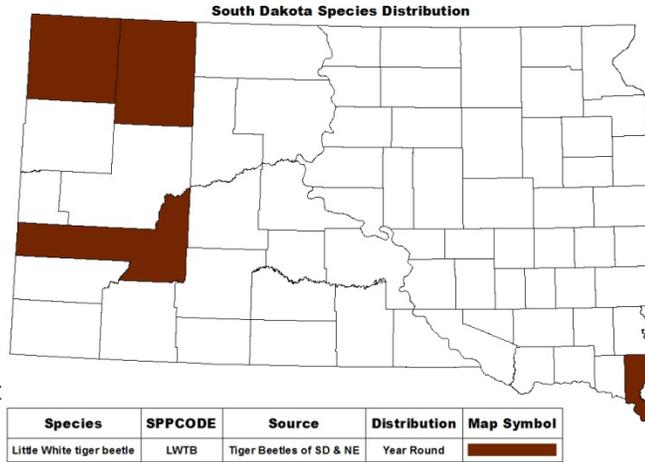
Small tiger beetle; brown background with white markings that make it appear mostly white.

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found throughout South Dakota. See map at right for current distribution.



Key Habitat:

Prefers the open, blowing portion of large sand dunes or sand beaches.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: stabilization activities to reduce blowing sand

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies and landowners to reduce stabilization activities near habitat

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

Priority Research & Monitoring Needs (Appendices G-K):

- Survey dunes in the Hecla area to see if species is still present
- Identify impacts of intensive grazing
- Identify undisturbed blowouts inland or along shores of lakes or rivers; potential techniques are blacklighting or use of mercury vapor

South Dakota Wildlife Action Plan

Northern Sandy Tiger Beetle

NSTB

Cicindela limbata nympha

Description:

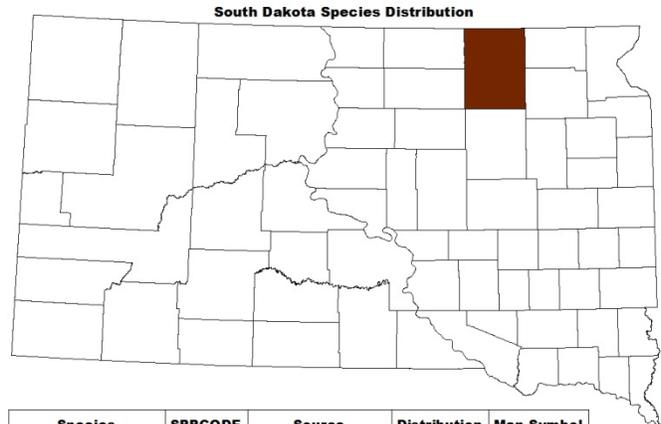
Tiger beetle with iridescent green dorsal surface and complete, broad spots covering most of the anterior wings.

Protection Status:

Federal: None
 State: None

Distribution:

See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Northern sandy tiger beetle	NSTB	Tiger Beetles of SD & NE	Year Round	

Key Habitat:

Prefers dry, sandy dunes and sandy areas away from water.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: off-road vehicle use that destroys larval burrows

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: develop public education materials for off-road vehicle use in habitat

Priority Research & Monitoring Needs (Appendices G-K):

Population surveys

South Dakota Wildlife Action Plan

Ottoe Skipper

OTSK

Hesperia ottoe

Description:

Butterfly; males are yellowish orange, females are dull brown.

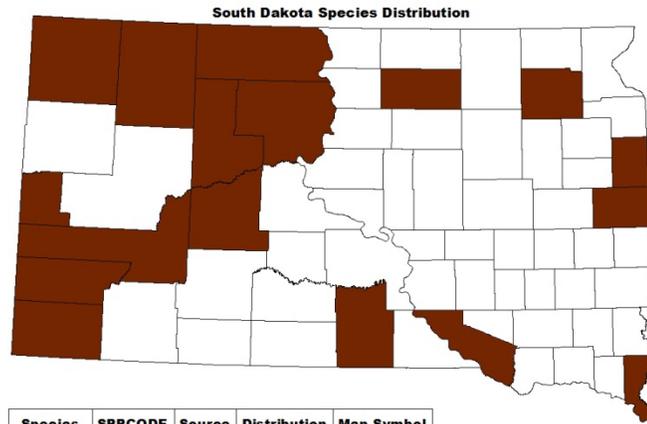
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers mid- to tall-statured grass ecosystems.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: poorly timed mowing/grazing/fire that removes nectar sources or vegetation during larval leaf-shelter phase; pesticide/herbicides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Monitoring butterfly species of concern in South Dakota (T-17B)

Priority Research & Monitoring Needs (Appendices G-K):

Population surveys

Existing Recovery Plans/Conservation Strategies:

Dana, R. P. 1991. Conservation management of the prairie skippers *Hesperia dacotae* and *Hesperia ottoe*. Minnesota Agricultural Experiment Station Bulletin 594-1991. University of Minnesota, St. Paul, MN. 63 pp.

South Dakota Wildlife Action Plan

Pahasapa Fritillary

PAFR

Speyeria atlantis pahasapa

Description:

Butterfly with orange-brown color above and a complex black pattern of spots, bars, and chevrons.

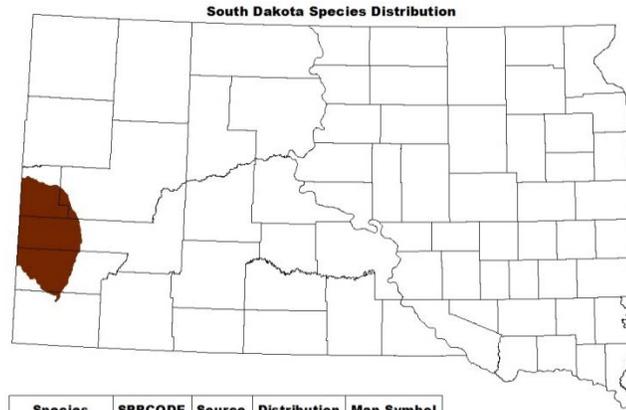
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers openings in boreal forest ecosystems; riparian/wetland ecosystems with wet meadows and abundant violets; may be particularly associated with beaver ponds.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: a general lack of information regarding this species

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: none

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Monitoring butterfly species of concern in South Dakota (T-17B)

Priority Research & Monitoring Needs (Appendices G-K):

Map and assess quality of remaining native prairie on a recurring basis

Population surveys

South Dakota Wildlife Action Plan

Poweshiek Skipperling

POSK

Oarisma poweshiek

Description:

Butterfly with very dark brown body and upper wings.

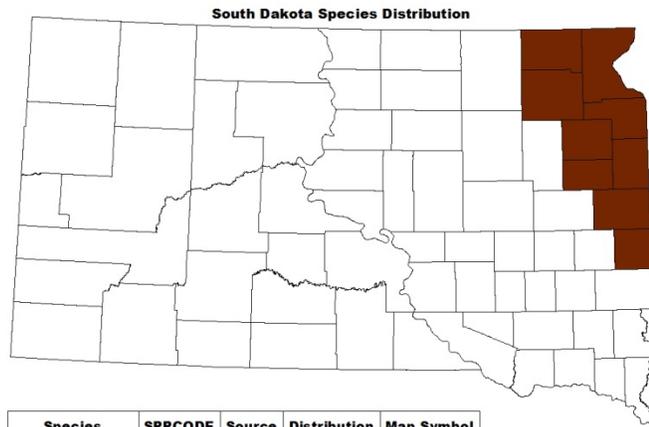
Protection Status:

Federal: Endangered

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 56, 102A, 102B, and 102C. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Poweshiek skipperling	POSK	SDNHD	Year Round	

Key Habitat:

Prefers lightly grazed tall grass ecosystems with a significant component of plants in the sunflower family; may use the edge of grass/sedge dominated riparian/wetland ecosystems.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: excessive prescribed burning (burn intervals of 3 –5 years or less is detrimental); herbicide/pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Population surveys

SWG Accomplishments (Appendix F):

Monitoring butterfly species of concern in South Dakota (T-17B)

Priority Research & Monitoring Needs (Appendices G-K):

Continued monitoring

Existing Recovery Plans/Conservation Strategies:

USFWS. 2011. Candidate Assessment Form. Available online at:

<http://www.fws.gov/Midwest/endangered/insects/posk/pdf/POSKCandidateAssessmentForm2011.pdf>

South Dakota Wildlife Action Plan

Regal Fritillary

REFR

Speyeria idalia

Description:

Large orange-black butterfly; sometimes confused with the monarch.

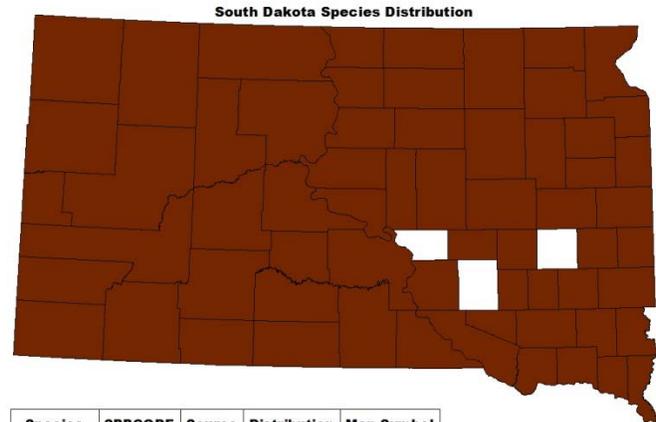
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat throughout South Dakota with the exception of MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Regal Fritillary	REFR	SDNHD	Year Round	

Key Habitat:

Prefers tall-statured or lightly grazed grass ecosystems containing violet species and nectar sources.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: poorly timed prescribed fire that results in direct mortality; poorly timed mowing/haying/grazing; pesticide/herbicide application

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Opportunistic data collection through Natural Heritage Program

SWG Accomplishments (Appendix F):

Monitoring butterfly species of concern in South Dakota (T-17B)

Priority Research & Monitoring Needs (Appendices G-K):

Population surveys

Map and assess quality of native prairie on a recurring basis

Existing Recovery Plans/Conservation Strategies:

1) Selby, G. 2007. Regal Fritillary (*Speyeria idalia* Drury): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/regalfritillary.pdf>; 2) Royer, R.A. and G.M. Marrone, 1992. Conservation status of the regal fritillary (*Speyeria idalia*) in North and South Dakota. Report to the U.S. Fish and Wildlife Service, Region 6.

South Dakota Wildlife Action Plan

Cooper's Rocky Mountainsnail

CRMO

Oreohelix strigosa cooperi

Description:

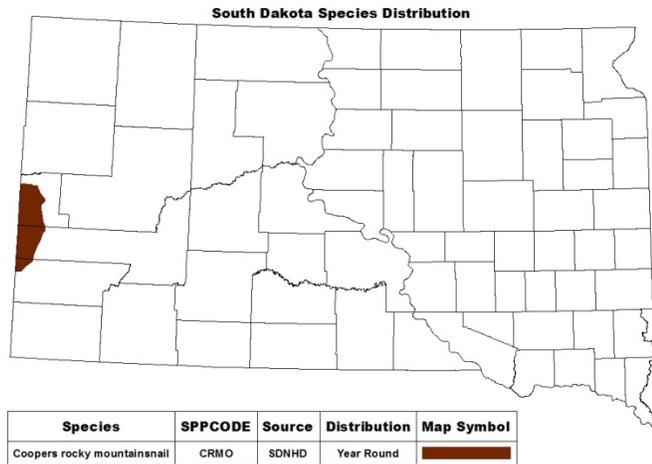
Land snail

Protection Status:

Federal: None
 State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Key Habitat:

Prefers calcareous soils in moist ponderosa pine forests above 3000 feet; also found in white spruce/ponderosa pine riparian communities.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5
 Non-habitat: road construction/salting; recreation; and herbicides/pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6
 Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Black Hills land snail surveys

SWG Accomplishments (Appendix F):

A proposal to examine the endemism and population relationships of the Black Hills *Oreohelix* snails (T-11)

Priority Research & Monitoring Needs (Appendices G-K):

Periodic surveys to monitor population status and trends

South Dakota Wildlife Action Plan

Dakota Vertigo

DAVE

Vertigo arthuri

Description:

Land snail with a dark orange/brown shell.

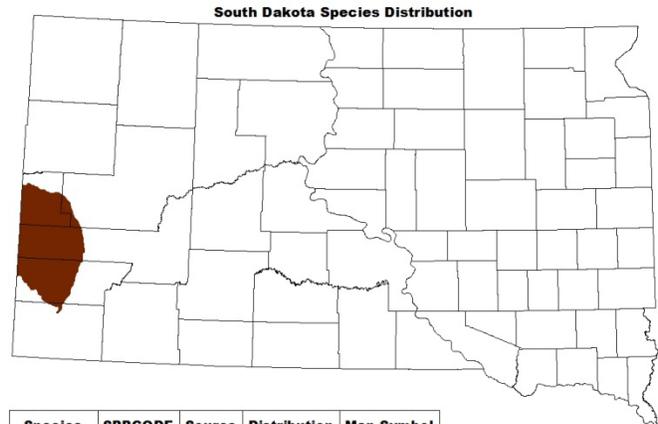
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MRLAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Dakota vertigo	DAVE	SDNHD	Year Round	

Key Habitat:

Prefers undisturbed, moist forests of white spruce or ponderosa pine; understory often characterized by deep litter

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: road construction/salting; recreation; and herbicides/pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Black Hills land snail surveys

Priority Research & Monitoring Needs (Appendices G-K):

Periodic surveys to monitor status and trends

Existing Recovery Plans/Conservation Strategies:

Anderson, T. (2004, September 16). Callused Vertigo (*Vertigo arthuri*): A technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/callusedvertigo.pdf>

South Dakota Wildlife Action Plan

Frigid Ambersnail

FRAM

Catinella gelida

Description:

Land snail

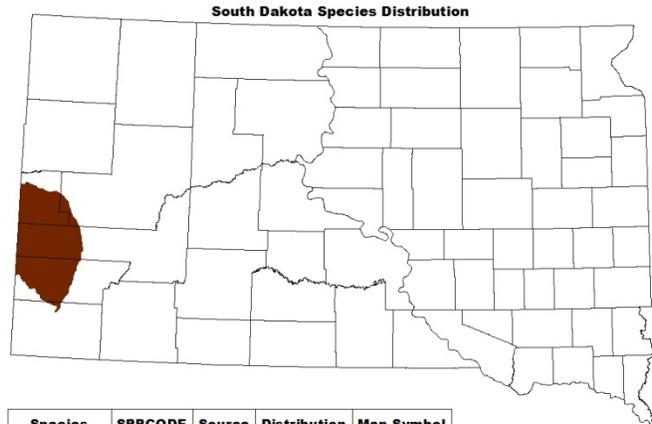
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Frigid ambersnail	FRAM	SDNHD	Year Round	

Key Habitat:

Prefers low to medium elevation well-forested, cold-air drainage slopes; often located near limestone talus near the base of a slope.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: road construction/salting; recreation; and herbicides/pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and industry to reduce disturbance; work with agencies, landowners, and industry to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Black Hills land snail surveys

Priority Research & Monitoring Needs (Appendices G-K):

Periodic surveys to monitor population status and trends

South Dakota Wildlife Action Plan

Mystery Vertigo

MYVE

Vertigo paradoxa

Description:

Very small land snail; cinnamon colored with a "beehive" or cylindrical shell.

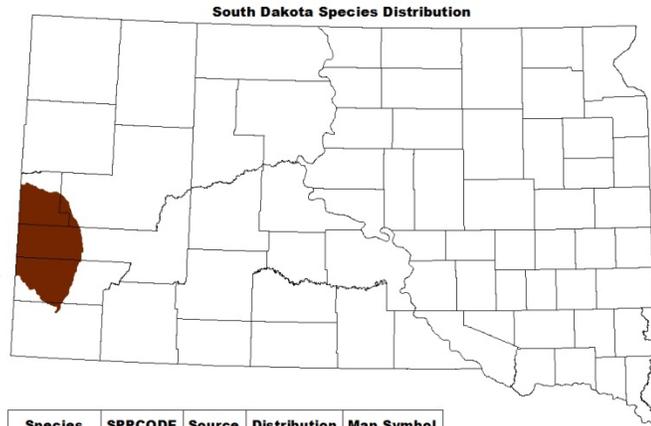
Protection Status:

Federal: None

State: None

Distribution:

This species is believed to have historically occurred in appropriate habitat found in MLRAs 61 and 62. See map at right for current distribution.



Species	SPPCODE	Source	Distribution	Map Symbol
Mystery vertigo	MYVE	SDNHD	Year Round	

Key Habitat:

Prefers forest dominated by white spruce or ponderosa pine; north-facing slopes; limestone or schist substrates.

Conservation Challenges:

Habitat: see conservation challenges for native ecosystem diversity in Chapter 5

Non-habitat: herbicides/pesticides

Conservation Actions:

Habitat: see conservation actions for native ecosystem diversity in Chapter 6

Non-habitat: work with agencies and landowners to reduce pesticide/herbicide use in habitat

Current Monitoring & Inventory Programs (Appendix E):

Black Hills land snail surveys

Priority Research & Monitoring Needs (Appendices G-K):

Periodic surveys to monitor population status and trends

Existing Recovery Plans/Conservation Strategies:

Anderson, T. (2004, November 4). Mystery Vertigo (*Vertigo paradoxa*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available:

<http://www.fs.fed.us/r2/projects/scp/assessments/mysteryvertigo.pdf>

South Dakota Wildlife Action Plan

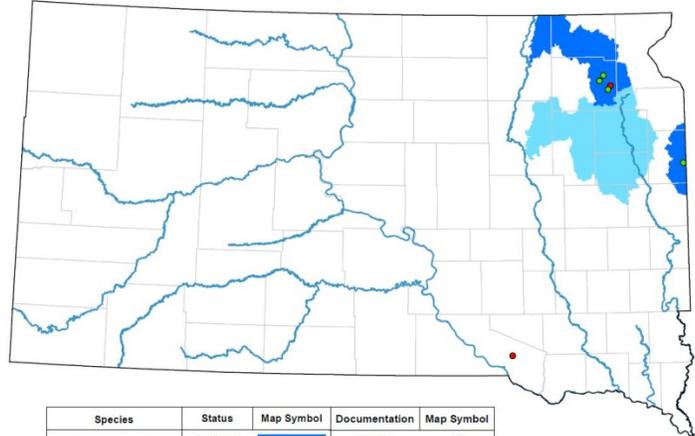
Banded Killifish

BAKI

Fundulus diaphanus

Description:

- Small, olive colored fish with yellow sides having green-brown vertical bands
- Protruding lower jaw & rounded caudal fin
- SIMILAR SPECIES: Central Mudminnow & Plains Topminnow, mudminnow are darker in color with irregular dark bands & topminnow lack bands



Protection Status:

- Federal: None
- State: Endangered
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically imperiled)

Distribution:

- Eastern SD- tributaries to the James, Vermillion & Big Sioux River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefer quiet, shallow lakes, ponds & streams with abundant aquatic vegetation & sandy, gravel substrates

Conservation Challenges:

- Modified flood regime
- Ecosystem/habitat conversion or loss
 - Shoreline development
 - Conversion of wetlands to agriculture
- Ecosystem alteration/habitat degradation
- Pollution/pesticides/herbicides

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- None.

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams–T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Blacknose Shiner

BLSH

Notropis heterolepis

Description

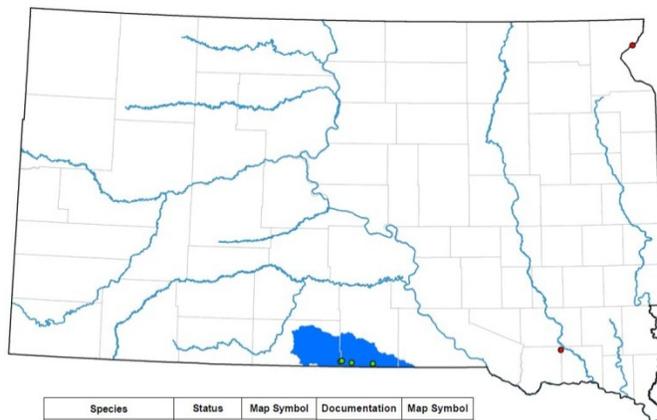
- Slender, silvery minnow with dark edged scales above lateral line & large eyes
- Black crescent-shaped marks forming stripe along sides from nose to caudal fin & passing through the eye

Protection Status:

- Federal: None
- State: Endangered
- Global Rank: G4 (Apparently secure)
- State Rank: S1 (Critically imperiled)

Distribution:

- Southern SD- tributaries to the James & Keya Paha River basin
- SD is on the western periphery of the range for this species



Key Habitat:

- Prefer cool, highly vegetated streams, small rivers & lakes with sandy substrates

Conservation Challenges:

- Ecosystem alteration/habitat degradation
 - Increased turbidity & siltation of stream bottoms
 - Reduced aquatic & riparian vegetation
- Grazing/Agricultural practices
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8

Priority Research & Monitoring Needs (Appendices G-K):

- Determine current distribution & status through continued monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Blackside Darter

BLDA

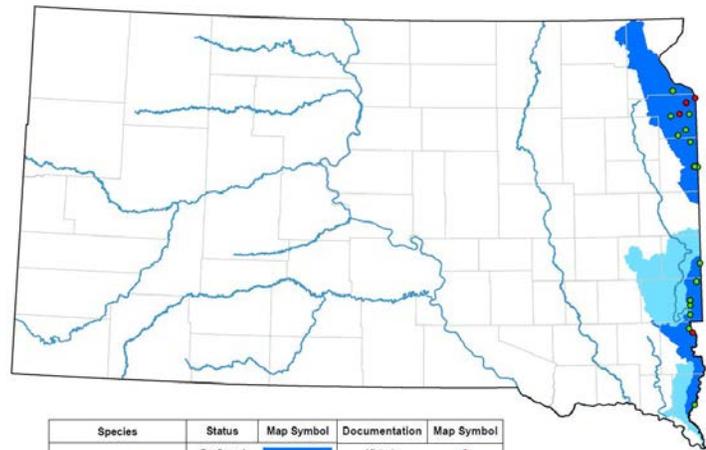
Percina maculata

Description:

- Olive colored darter with a broad black stripe along sides made up of 8 to 9 blotches.
- Black spot at base of rounded tail fin
- Fully scaled head with tear drop spot below eye
- SIMILAR SPECIES: Logperch

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)



Distribution:

- Eastern SD-tributaries to the Big Sioux & Minnesota River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefers pools of streams to medium sized rivers with moderate current & sand or gravel substrates

Conservation Challenges:

- Modified flood regimes
- Reduced number of beaver ponds/dams
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
 - Channelization
- Pollution/pesticides/herbicides
 - Increased turbidity
- Grazing/Agricultural practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Restore & maintain habitat & stream connectivity

Current Monitoring & Inventory Programs (Appendix E):

- None.

SWG Accomplishments (Appendix F):

- Comprehensive aquatics survey of the Minnesota River tributaries – T-17D

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Blue Sucker

BLSU

Cytleptus elongatus

Description:

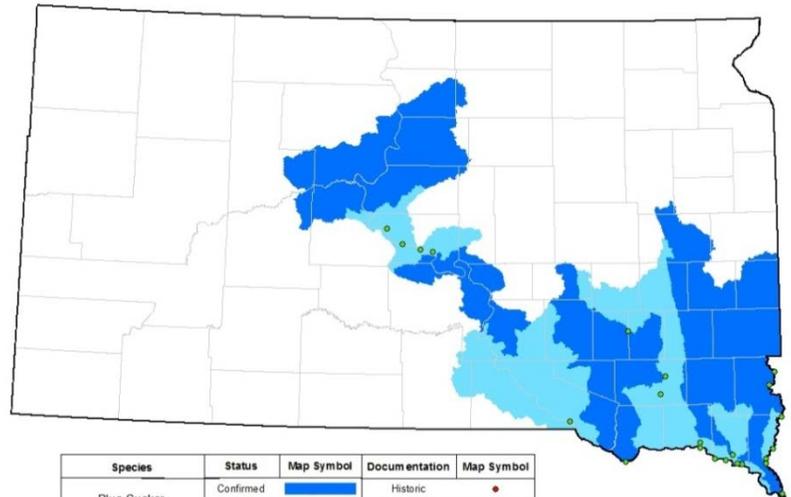
- Large, slender, dark bodied fish
- Small head and a long sickle shaped dorsal fin
- Most range in size from 16-24 inches and 1.5-3 pounds

Protection Status:

- Federal: None
- State: None
- Global Rank: G3 (Vulnerable)
- State Rank: S3 (Vulnerable)

Distribution:

- Central SD-Missouri River basin
- SD is on the northern edge of the range for this species



Key Habitat:

- Prefers large, rivers with natural hydrographs
- Prefers riffle habitats with clear, fast flowing water and smooth, hard substrates.

Conservation Challenges:

- Modified flood regimes
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
 - Channelization
 - Dredging
- Pollution/pesticides/herbicides
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Partner with federal fish hatcheries to develop a captive breeding and stocking program
- River corridor habitat protection through conservation programs/incentives or purchase

Current Monitoring & Inventory Programs (Appendix E):

- Lower Missouri River Fish Surveys (USACE, USFWS, SDGFP)
- Missouri River reservoir fisheries surveys (SDGFP)

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop standardized protocols for monitoring all life history stages among all habitats
- Evaluate the role of sediment transport & discharge on the creation & maintenance of habitats for all life stages
- Identify reproductive potential and life history
- Identify natal and spawning areas
- Research seasonal movements

South Dakota Wildlife Action Plan

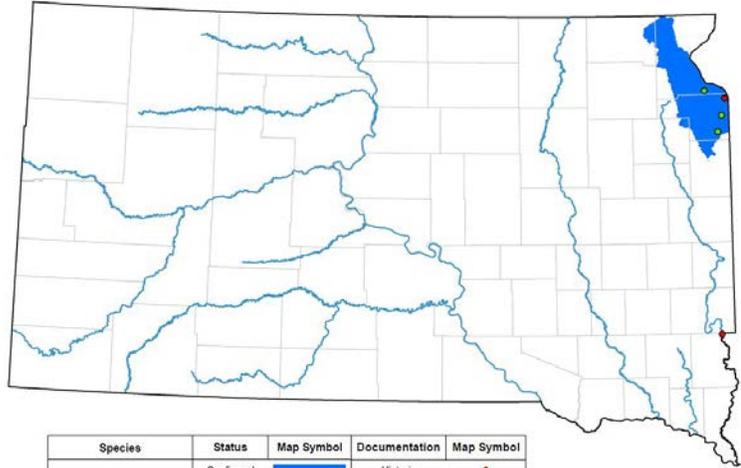
Carmine Shiner

CASH

Notropis percobromus

Description:

- Small, slender minnow that is olive colored above the lateral line & silvery below
- Black line above the silver line along sides
- Snout is pointed & longer than the diameter of the eye
- Breeding adults develop red color on heads, bellies & fins
- SIMILAR SPECIES: Emerald Shiner, outside of spawning seasons they look similar



Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)

Distribution:

- Eastern SD-tributaries to the Big Sioux & Minnesota River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefers clear, swift, large streams & small rivers with gravel or rocky substrates
- Usually occurs in riffles, rocky runs or flowing pools

Conservation Challenges

- Modified flood regimes
 - Increased turbidity
- Ecosystem alteration/habitat degradation
 - Channelization
 - Impoundments
- Pollution/pesticides/herbicides
 - Grazing/Agricultural practices
 - Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams – T-9
- Comprehensive aquatics survey of the Minnesota River tributaries – T-17D

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

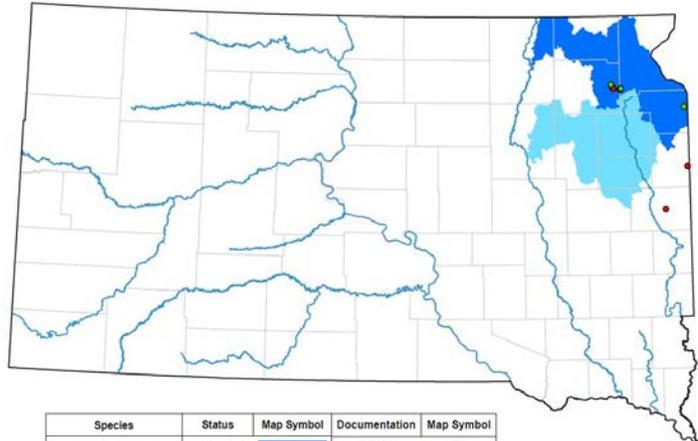
Central Mudminnow

CEMU

Umbra limi

Description:

- Small, slender fish that is dark olive-brown in color with light belly
- Lacking lateral line with several irregular dark vertical bars
- Caudal fin is rounded with a black vertical bar at the base
- SIMILAR SPECIES: Banded Killifish & Plains Topminnow, differences are these fish are lighter in color. Banded Killifish have narrower more regular vertical bars & Plains Topminnow lack bars on the sides



Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)

Distribution:

- North eastern SD- tributaries to the Big Sioux & Minnesota River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefer cool, slow moving streams, marshes, ponds & backwater areas with dense aquatic vegetation & muddy substrates

Conservation Challenges:

- Reduced number of beaver ponds/dams
- Ecosystem habitat conversion or loss
 - Impoundments
 - Conversion of wetlands to agriculture
- Ecosystem alteration/habitat degradation
 - Urbanization
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Maintain/restore natural hydrology & stream connectivity when possible

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams – T-9
- Comprehensive aquatics survey of the Minnesota River tributaries - T-17D

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Finescale Dace

FIDA

Chrosomus neogaeus

Description:

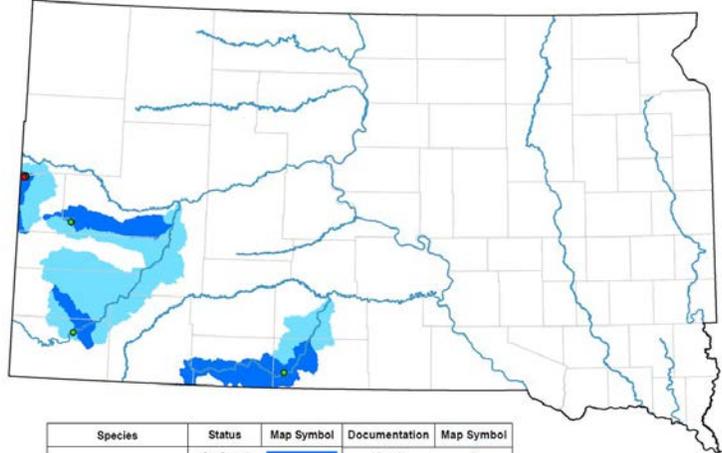
- Small fish with olive back & dark lateral stripe ending with spot at base of caudal fin
- Iridescent, silvery band above lateral stripe
- Breeding males have yellow to red belly

Protection Status:

- Federal: None
- State: Endangered
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically imperiled)

Distribution:

- Western SD- tributaries to the Cheyenne, Belle Fourche & Little White River basins
- SD is on the southern periphery of the range for this species



Species	Status	Map Symbol	Documentation	Map Symbol
Finescale Dace	Confirmed	Dark Blue	Historic	Red Dot
	Probable	Light Blue	Current	Green Dot

Key Habitat:

- Prefers areas with dense aquatic vegetation of cool, headwaters, small streams & ponds
- Found in association with Northern Redbelly Dace

Conservation Challenges:

- Reduced number of beaver ponds/dams
- Ecosystem alteration/habitat degradation
 - Degraded water quality
- Extremely vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Develop reintroduction programs for Finescale Dace into suitable habitats

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region – T-2-8
- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams–T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities
- Investigate reintroduction capabilities

Existing Recovery Plan/Conservation Strategies:

Isaak, D.J., W.A. Hubert, and C.R. Berry, Jr. 2002. Conservation Assessment for Lake Chub, Mountain Sucker, and Finescale Dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region.

South Dakota Wildlife Action Plan

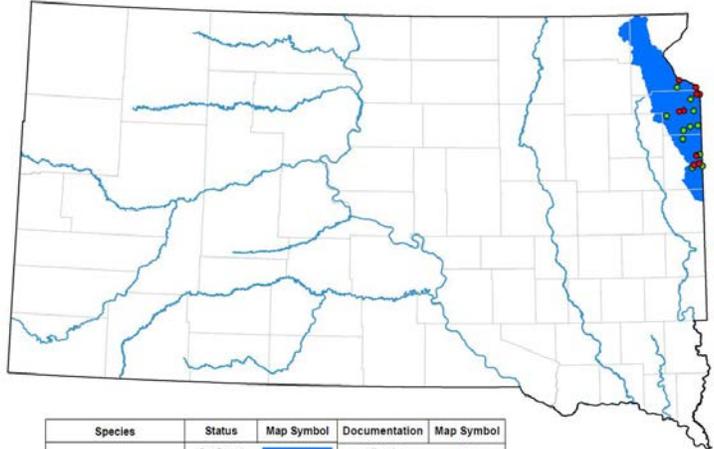
Hornyhead Chub

HOCH

Nocomis biguttatus

Description:

- Stout minnow with olive-brown back, iridescent green sides & white belly
- Barbels on edges of mouth & red spot behind eye, which is less prominent in adults
- Dark stripe along sides with black spot at base of caudal fin
- Breeding males display horn-like structures (tubercles) on their head
- SIMILAR SPECIES: Creek Chub & Central Stoneroller



Species	Status	Map Symbol	Documentation	Map Symbol
Hornyhead Chub	Confirmed		Historic	●
	Probable		Current	●

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S3 (Vulnerable)

Distribution:

- Eastern SD-tributaries to the Big Sioux & Minnesota River basins
- SD is within the center of the range for this species

Key Habitat:

- Prefers pools & runs of small to medium sized streams with gravel substrates & moderate to no flow

Conservation Challenges:

- Ecosystem/habitat conversion or loss
 - Channelization
- Ecosystem alteration/habitat degradation
 - Impoundments
- Pollution/pesticides/herbicides
 - Increased water turbidity
- Grazing/Agricultural practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Priority Research & Monitoring Needs (Appendices G-K):

- Develop baseline data & current status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Lake Chub

LACH

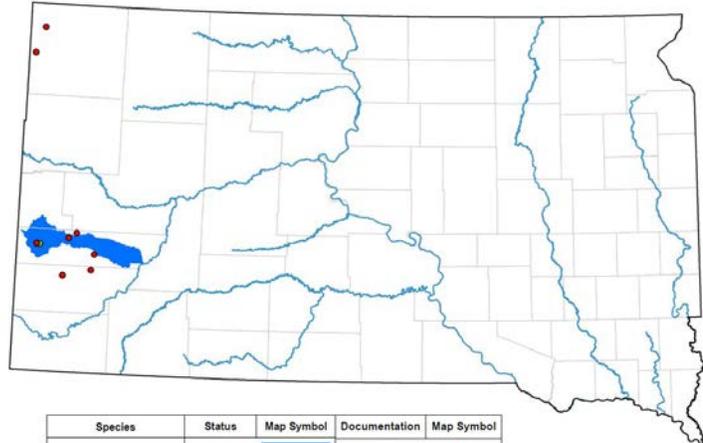
Couesius plumbeus

Description:

- Silver-gray color with light belly
- Lead colored mid lateral stripe is present but not conspicuous
- Scattered dark scales give a speckled appearance
- Well-developed barbel located at corners of mouth

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically imperiled)



Species	Status	Map Symbol	Documentation	Map Symbol
Lake Chub	Confirmed	Blue shaded area	Historic	Red dot
	Probable	Light blue shaded area	Current	Green dot

Distribution:

- Western SD-tributaries to the Cheyenne & Belle Fourche River basins
- SD is on the southern periphery of the range for this species

Key Habitat:

- Occurs in varied habitats, both large/small water bodies & standing/flowing waters
- Prefer gravel bottomed pools & runs of streams & along rocky lake margins

Conservation Challenges:

- Modified/suppressed fire regimes
- Exotic/introduced species impacts
- Ecosystem alteration/habitat degradation
 - Mining
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
 - Heavy grazing
- Forest Management Practices
 - Logging

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Develop programs to reduce or eliminate the treat non-native species on Lake Chub
- Develop captive breeding and reintroduction programs for Lake Chub into suitable habitats

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams and rivers inventory survey

SWG Accomplishments (Appendix F):

- An aquatic invasive species risk assessment for South Dakota – T-36

Priority Research & Monitoring Needs (Appendices G-K):

- Determine distribution & current status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities
- Investigate captive breeding capabilities for future reintroductions

South Dakota Wildlife Action Plan

Existing Recovery Plan/Conservation Strategies:

Isaak, D.J., W.A. Hubert, and C.R. Berry. Jr. 2002. Conservation Assessment for Lake Chub, Mountain Sucker, and Finescale Dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region

South Dakota Wildlife Action Plan

Logperch

LOGP

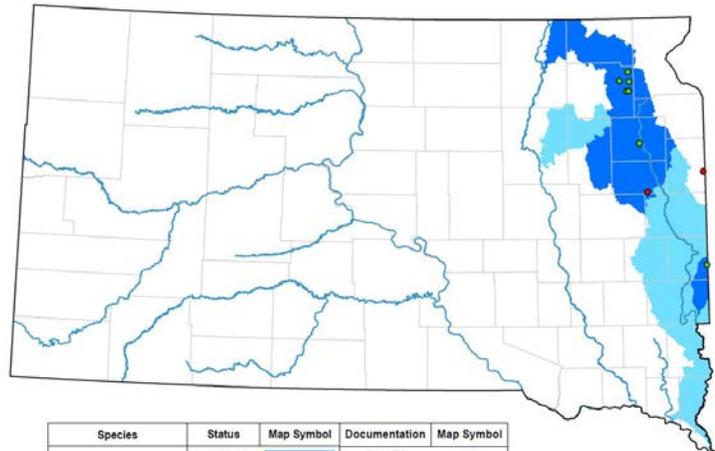
Percina caprodes

Description:

- Yellowish-brown fish with several vertical bars of alternating length on the sides
- Black spot at base of rounded caudal fin
- Lacks scales on head, with tear drop spot below eyes
- SIMILAR SPECIES: Blackside Darter

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S3 (Vulnerable)



Species	Status	Map Symbol	Documentation	Map Symbol
Logperch	Confirmed	Blue	Historic	Red dot
	Probable	Light Blue	Current	Green dot

Distribution:

- Eastern SD-tributaries to the Big Sioux & Minnesota River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefers rivers, lakes & reservoirs with sand or gravel substrates & aquatic vegetation

Conservation Challenges:

- Modified flood regimes
- Reduced number of beaver ponds/dams
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
- Channelization
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Priority Research & Monitoring Needs (Appendices G-K):

- Develop baseline data & current status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Longnose Sucker

LOSU

Catostomus catostomus

Description:

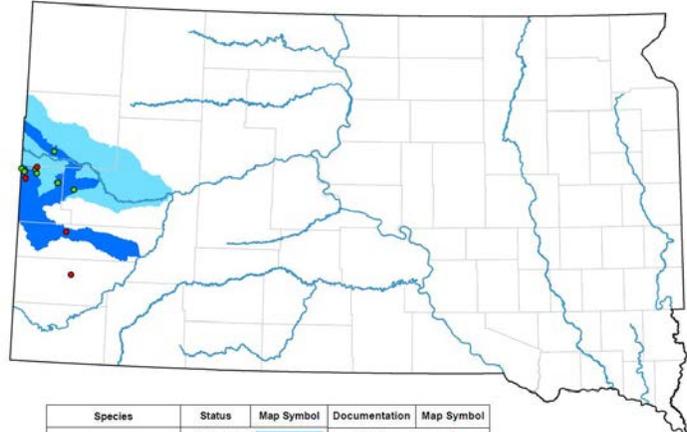
- Elongated, cylindrical sucker with long pointed snout
- Gray to black back with light belly
- Breeding males have a wide, crimson band on their side that extends onto the snout

Protection Status:

- Federal: None
- State: Threatened
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically imperiled)

Distribution:

- Western SD- tributaries to the Cheyenne & Belle Fourche River basins
- SD is within the center of the range for this species



Species	Status	Map Symbol	Documentation	Map Symbol
Longnose Sucker	Confirmed	Blue shaded area	Historic	Red dot
	Probable	Light blue shaded area	Current	Green dot

Key Habitat:

- Prefers cool, clear, spring-fed streams & lakes

Conservation Challenges:

- Ecosystem alteration/habitat degradation
 - Mining
 - Logging
 - Road construction
- Grazing/agricultural practices
 - Heavy grazing
- Highly vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Restore & maintain habitat & stream connectivity

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams – T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Mountain Sucker

MOSU

Catostomus platyrhynchus

Description:

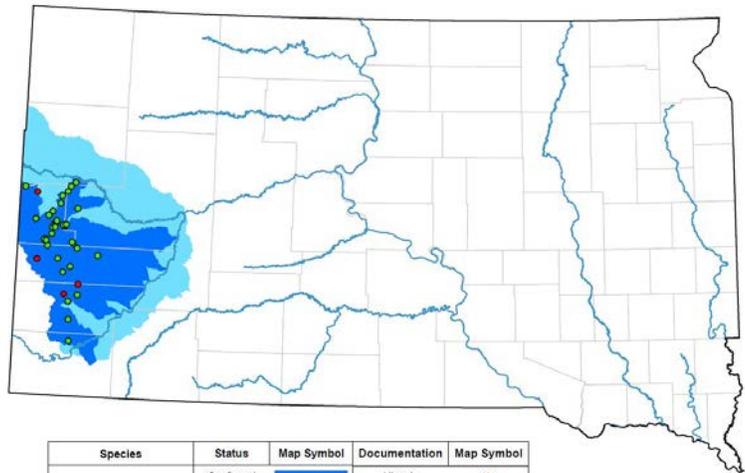
- Stout sucker with a small, round head
- Dark brown with black/dark mottling shaped saddles across back, fading to white on the belly

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S3 (Vulnerable)

Distribution:

- Western SD-tributaries to the Cheyenne & Belle Fourche River basins
- SD is on the eastern periphery of the range for this species



Key Habitat:

- Clear, cold streams & small to medium sized rivers
- Waters with clear rubble, gravel or sand substrates
- Juveniles inhabit slower moving water in side channels or weedy backwater areas

Conservation Challenges:

- Modified/suppressed fire regimes
- Exotic/introduced species impacts
- Ecosystem alteration/habitat degradation
 - Mining
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
 - Heavy grazing
- Forest Management Practices
 - Logging
- Extremely vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Provide conservation programs/incentives to landowners to secure the long-term protection of unique & high quality Mountain Sucker habitats
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Develop programs to reduce or eliminate the treat of predation on Mountain Sucker by non-native trout species
- Develop captive breeding and reintroduction programs for Mountain Suckers into suitable habitats

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Conservation status of the mountain sucker in South Dakota – T-2-2
- An aquatic invasive species risk assessment for South Dakota – T-36

South Dakota Wildlife Action Plan

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Assess current density & genetic variation for Mountain Suckers
- Identify limiting factors in current populations
- Research seasonal movements, migration patterns, & recolonization capabilities
- Investigate captive breeding capabilities for future reintroductions

Existing Recovery Plans:

Isaak, D.J., W.A. Hubert, and C.R. Berry. Jr. 2002. Conservation Assessment for Lake Chub, Mountain Sucker, and Finescale Dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region

South Dakota Wildlife Action Plan

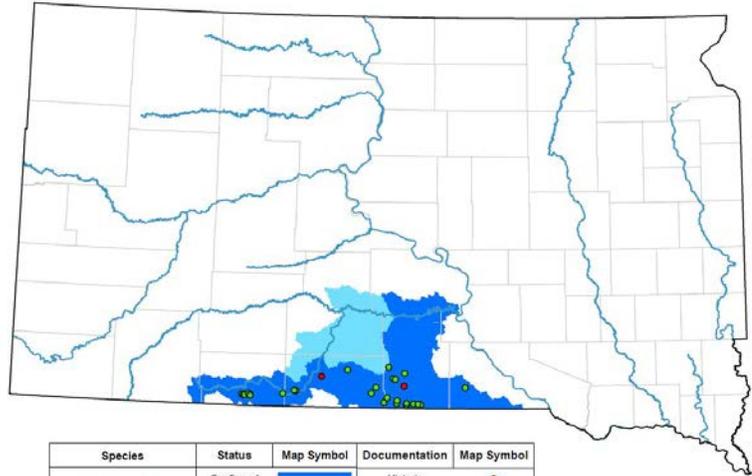
Northern Pearl Dace

NPDA

Margariscus nachtriebi

Description:

- Small, dark colored minnow with light belly & spot near base of caudal fin
- Young have a dark lateral stripe
- Flap-like barbel in front of jaw
- Breeding males have red sides & belly



Protection Status:

- Federal: None
- State: Threatened
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)

Distribution:

- South central SD- tributaries to the Little White & Keya Paha River basins
- SD is on the southern periphery of the range for this species

Key Habitat:

- Prefers cool, bogs, ponds, beaver ponds, lakes, & small clear streams

Conservation Challenges:

- Reduced number of beaver ponds/dams
- Ecosystem/habitat conversion or loss
 - Impoundments
 - Channelization
 - Pond drainage
 - Conversion of land to agriculture
- Ecosystem alteration/habitat degradation
- Pollution/pesticides/herbicides
- Extremely vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Restore & maintain habitat & landscape connectivity
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Glacial relict fishes in spring fed headwater streams of South Dakota’s Sandhills region – T-2-8
- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors

South Dakota Wildlife Action Plan

Northern Redbelly Dace

NRDA

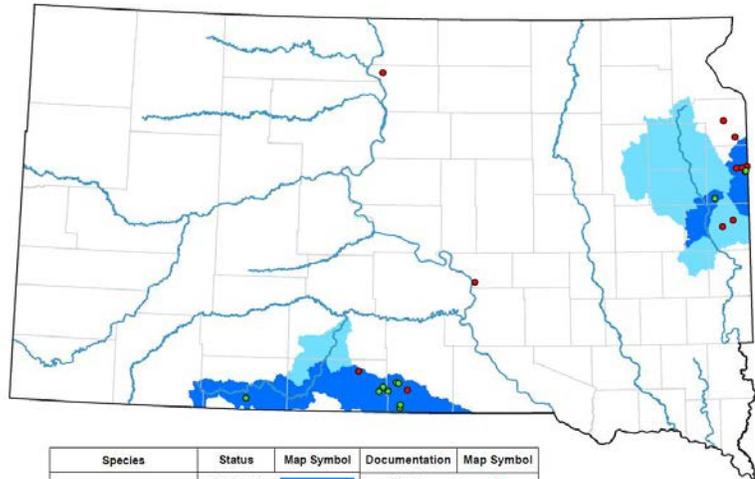
Chrosomus eos

Description:

- Small fish with olive-brown back with 2 black stripes along sides
- Breeding males have brilliant red belly & yellow fins
- SIMILAR SPECIES: Finescale Dace, Northern Pearl Dace & Southern Redbelly Dace

Protection Status:

- Federal: None
- State: Threatened
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)



Species	Status	Map Symbol	Documentation	Map Symbol
Northern Redbelly Dace	Confirmed	Dark Blue	Historic	Red Dot
	Probable	Light Blue	Current	Green Dot

Distribution:

- Southern & north eastern SD-tributaries to the Missouri River, Minnesota, Big Sioux, White, Niobrara & Keya Paha River basins
- SD is on the southern periphery of the range for this species

Key Habitat:

- Prefer vegetated areas of quiet spring-fed streams, bogs, & beaver ponds

Conservation Challenges:

- Ecosystem alteration/habitat degradation
 - Reduced # of beaver dams/ponds
 - Mining
 - Logging
 - Construction of roads
 - Heavy grazing
 - Stream channelization
- Hybridization with Finescale Dace
- Extremely vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Glacial relict fishes in spring fed headwater streams of South Dakota’s Sandhills region – T-2-8
- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams– T-9
- Comprehensive aquatics survey of the Minnesota River tributaries – T-17D

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Pallid Sturgeon

PAST

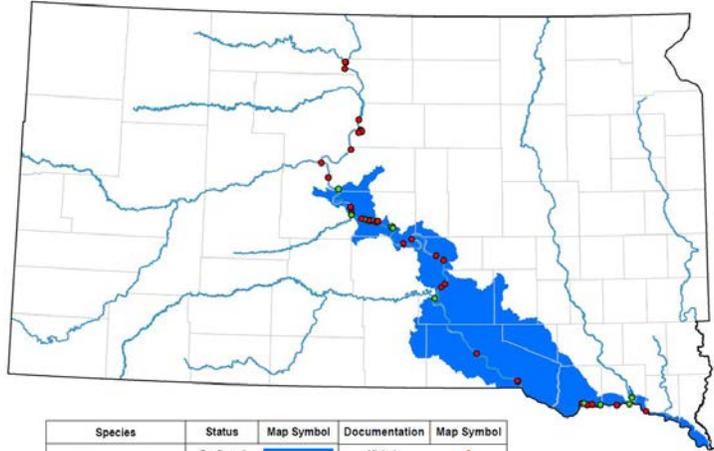
Scaphirhynchus albus

Description:

- Large, flat bodied fish, wider towards the bottom, & grey-white color
- Flat, shovel-shaped snout
- Bony plates on top & sides, but LACKING on belly
- Bases of outer chin barbels slightly farther back & twice as long as inner barbels
- SIMILAR SPECIES: Shovelnose Sturgeon

Protection Status:

- Federal: Endangered
- State: Endangered
- Global Rank: G2 (Imperiled)
- State Rank: S1 (Critically imperiled)



Distribution:

- Central SD-Missouri River basin
- SD is within the center of the range for this species

Key Habitat:

- Prefers large, rivers with natural hydrographs
- Diverse depths & velocities, sand bars, sand flats & gravel bars

Conservation Challenges:

- Modified flood regimes
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
 - Channelization
 - Dredging
- Pollution/pesticides/herbicides
- Hybridization with shovelnose sturgeon
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop captive breeding and stocking programs
- River corridor habitat protection through conservation programs/incentives or purchase

Current Monitoring & Inventory Programs (Appendix E):

- Lower Missouri River Fish Surveys (USACE, USFWS, SDGFP)

SWG Accomplishments (Appendix F):

- Development & application of a habitat assessment tool for juvenile pallid sturgeon in the upper Missouri River – T-24

South Dakota Wildlife Action Plan

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop standardized protocols for monitoring all life history stages
- Evaluate the role of sediment transport & discharge on the creation & maintenance of habitats for all life stages
- Identify limiting factors associated with natural recruitment
- Research spawning & potential natural recruitment on the James River & below Gavin's Point Dam
- Research seasonal movements

Existing Recovery Plans:

- 1) U.S. Fish and Wildlife Service. 1993. Pallid Sturgeon Recovery Plan. USFWS, Bismarck, North Dakota. 55 pp.; 2) SDGFP. 2005. South Dakota pallid sturgeon (*Scaphirhynchus albus*) management plan. South Dakota Dept. of Game, Fish and Parks, Pierre, SD, Wildlife Division Report 2006-01. 41 pp. plus appendices. Available online at:
<http://gfp.sd.gov/wildlife/management/plans/docs/FinalPallidPlan.pdf>

South Dakota Wildlife Action Plan

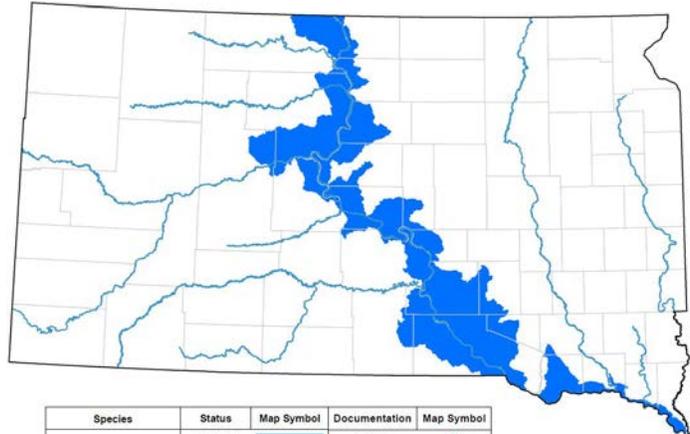
Shovelnose Sturgeon

SHST

Scaphirhynchus platyrhynchus

Description:

- Large, flat bodied fish, wider towards the bottom, & yellowish-brown in color
- Flat shovel-shaped snout
- Bony plates on top, sides, & belly
- Bases of barbels aligned in a single straight row & similar in length
- SIMILAR SPECIES: Pallid Sturgeon



Species	Status	Map Symbol	Documentation	Map Symbol
Shovelnose Sturgeon	Confirmed	■	Historic	●
	Probable	■	Current	●

Protection Status:

- Federal: Threatened
- State: None
- Global Rank: G4 (Apparently secure)
- State Rank: S4 (Apparently secure)

Distribution:

- Central SD-tributaries to the Missouri River basin
- SD is within the center of the range for this species

Key Habitat:

- Prefers swift currents of large rivers with natural hydrographs & deep channels

Conservation Challenges:

- Modified flood regimes
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
- Impoundments
- Channelization
- Dredging
- Pollution/pesticides/herbicides
- Hybridization with pallid sturgeon

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible

Current Monitoring & Inventory Programs (Appendix E):

- Lower Missouri River Fish surveys (USACE, USFWS, SDGFP)
- Missouri River reservoir fisheries surveys (SDGFP)

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Develop standardized protocols for monitoring all life history stages
- Evaluate the role of sediment transport & discharge on the creation & maintenance of habitats for all life stages
- Identify limiting factors associated with natural recruitment & hybridization with Pallid Sturgeon
- Research seasonal movements

South Dakota Wildlife Action Plan

Sicklefin Chub

SICH

Macrhybopsis meeki

Description:

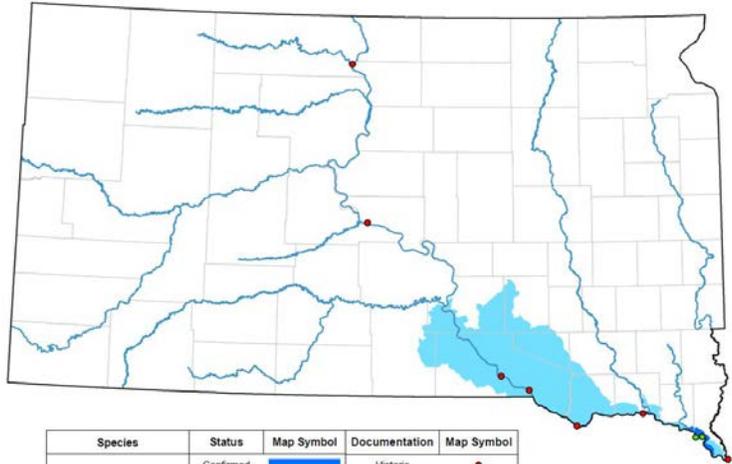
- Small, slender bodied minnow with small eyes & long sickle shaped pectoral fins
- Body yellowish-brown with silvery-white belly
- Conspicuous barbel at corners of mouth

Protection Status:

- Federal: None
- State: Endangered
- Global Rank: G3 (Vulnerable)
- State Rank: S1 (Critically imperiled)

Distribution:

- Central SD-tributaries to the Missouri River basin
- SD is on the northern periphery of the range for this species



Key Habitat:

- Prefer the main channels of large, turbid rivers with strong currents & sand or fine gravel substrates

Conservation Challenges:

- Exotic/introduced species impacts
- Modified flood regimes
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
 - Channelization
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce or eliminate the treat non-native species on Sicklefin Chub

Current Monitoring & Inventory Programs (Appendix E):

- Lower Missouri River Fish surveys (USACE, USFWS, SDGFP)
- Missouri River Reservoir fisheries surveys (SDGFP)

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

Existing Recovery Plan/Conservation Strategies:

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.

South Dakota Wildlife Action Plan

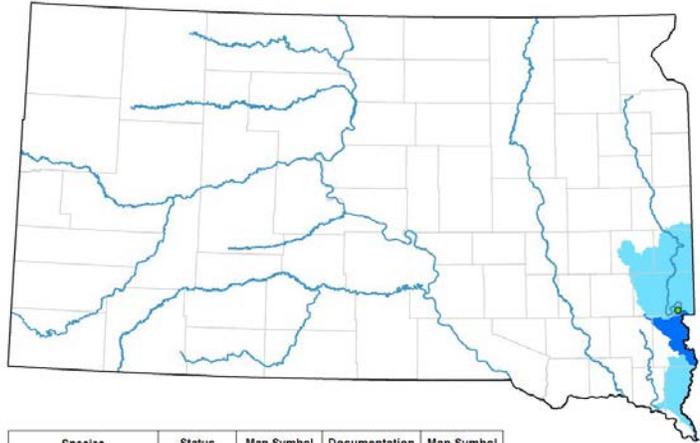
Southern Redbelly Dace

SRDA

Chrosomus erythrogaster

Description:

- Small, slender minnow with olive-brown back, light belly & extremely small scales
- Wedge shaped spot at the base of the caudal fin
- Two black strips along sides, upper stripe less prominent & lower stripe extending through the snout
- Breeding males have brilliant red belly & yellow fins
- SIMILAR SPECIES: Northern Redbelly Dace



Species	Status	Map Symbol	Documentation	Map Symbol
Southern Redbelly Dace	Confirmed	Dark Blue	Historic	Red dot
	Probable	Light Blue	Current	Green dot

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD-tributaries to the Big Sioux River basin
- SD is on the north western periphery of the range for this species

Key Habitat:

- Clear, cool, spring-fed headwater streams with rubble, gravel or sand substrates

Conservation Challenges:

- Ecosystem alteration/habitat degradation
 - Urban development
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
- Extremely vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts

Priority Research & Monitoring Needs (Appendices G-K):

- Develop baseline data & current status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Sturgeon Chub

STCH

Macrhybopsis gelida

Description:

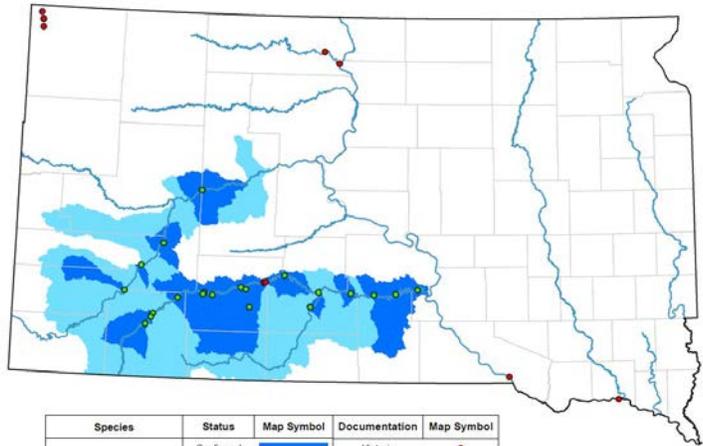
- Slender minnow with small eyes, brownish-blue back with dark specks & light belly
- Mouth inferior with conspicuous barbels

Protection Status:

- Federal: None
- State: Threatened
- Global Rank: G3 (Vulnerable)
- State Rank: S2 (Imperiled)

Distribution:

- Western SD- tributaries to the Cheyenne, White, Grand & Missouri River basins
- SD is within the central part of the range for this species



Key Habitat:

- Prefer areas with moderate to strong current on large rivers with rocks, gravel or coarse sand substrates

Conservation Challenges:

- Exotic/introduced species impacts
- Modified flood regimes
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Impoundments
- Channelization
- Water diversion
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices
- Highly vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Restore & maintain habitat & stream connectivity
- Develop programs to reduce or eliminate the treat of non-native fish competing with Sturgeon Chub

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory surveys (SDGFP, SDSU)
- Lower Missouri River Fish Surveys (USACE, SDGFP, USFWS)

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams – T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Develop a management plan
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

Existing Recovery Plan/Conservation Strategies:

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.

South Dakota Wildlife Action Plan

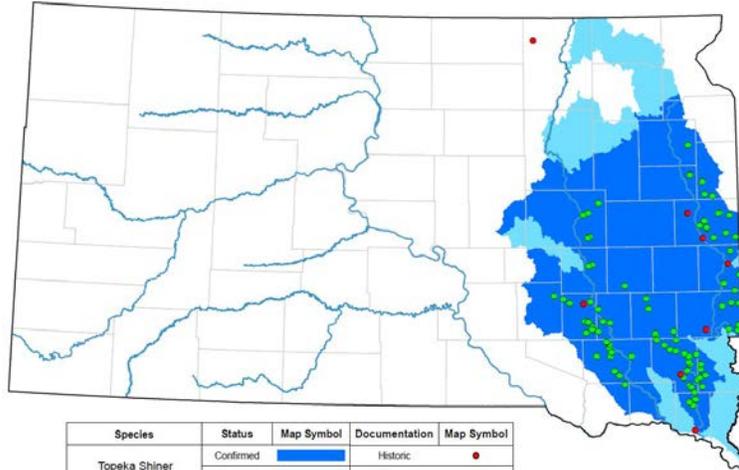
Topeka Shiner

TOSH

Notropis topeka

Description:

- Small, stout bodied minnow.
- Olive colored back with dark edged scales, lateral stripe & light underside.
- Caudal fin with chevron-shaped spot at the base.
- SIMILAR SPECIES: Sand Shiner



Protection Status:

- Federal: Endangered
- State: None
- Global Rank: G3 (Vulnerable)
- State Rank: S2 (Imperiled)

Distribution:

- Eastern SD- tributaries to the James, Vermillion & Big Sioux River basins.
- SD is on the northern periphery of the range for this species.

Key Habitat:

- Small streams with groundwater input & good water quality.
- Backwater areas, pools & dugouts with sand or gravel substrates.

Conservation Challenges:

- Exotic/introduced species impacts
 - Impoundments
 - Channelization
 - Water diversion
- Ecosystem/habitat conversion or loss
 - Urban development
 - Road-stream crossings
- Ecosystem alteration/habitat degradation
 - Pollution/pesticides/herbicides
 - Grazing/Agricultural practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Provide conservation programs/incentives to landowners to secure the long-term protection of unique & high quality Topeka Shiner habitats
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible

Current Monitoring & Inventory Programs (Appendix E):

- Topeka Shiner Monitoring (SDGFP)

SWG Accomplishments (Appendix F):

- Topeka Shiner monitoring in eastern South Dakota streams – T-12
- Topeka Shiner monitoring in eastern South Dakota streams (round two) – T-2-9

South Dakota Wildlife Action Plan

Priority Research & Monitoring Needs (Appendices G-K):

- Continue & expand current monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

Existing Recovery Plans:

- 1) Shearer, J.S. 2003. Topeka shiner management plan for the state of South Dakota. South Dakota Department of Game, Fish & Parks, Pierre, Wildlife Division Report No. 2003-10, 82 pp.;
- 2) U.S. Fish and Wildlife Service. 2009. Topeka shiner (*Notropis topeka*) Five year review: summary and evaluation. USFWS, Manhattan, Kansas. 44 pp.

South Dakota Wildlife Action Plan

Trout-Perch

TRPE

Percopsis omiscomaycus

Description:

- Small, thick bodied fish with a large scaleless head, adipose fin & spines
- Silvery to almost transparent in color with rows of dark spots along back & sides

Protection Status:

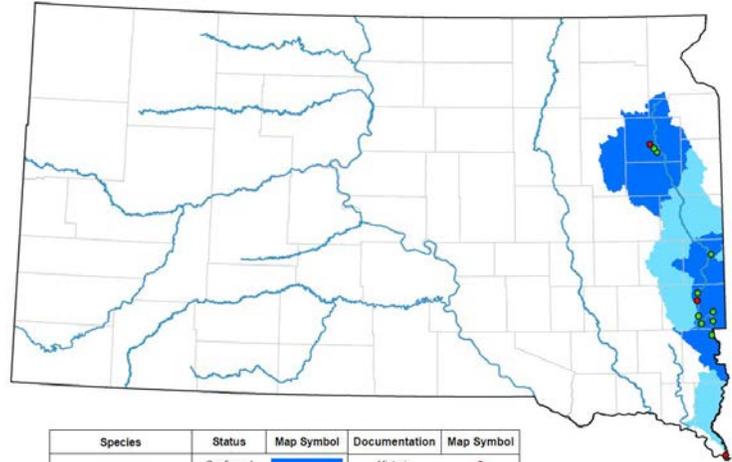
- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)

Distribution:

- Eastern SD-tributaries to the Big Sioux River basin
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefer deep flowing pools of streams, & small to large rivers, also found in lakes with sand or gravel substrates



Species	Status	Map Symbol	Documentation	Map Symbol
Trout-perch	Confirmed	Dark Blue	Historic	Red Dot
	Probable	Light Blue	Current	Green Dot

Conservation Challenges:

- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Impoundments
 - Channelization
- Ecosystem alteration/habitat degradation
 - Water diversion
- Pollution/pesticides/herbicides
- Grazing/Agricultural practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Restore & maintain habitat & stream connectivity
- Develop programs to reduce or eliminate the treat of non-native fish competing with Trout-perch

SWG Accomplishments (Appendix F):

- Evaluation of a decision support tool to help support fish species at risk in South Dakota streams – T-9

Priority Research & Monitoring Needs (Appendices G-K):

- Determine baseline data & status through monitoring efforts
- Assess population dynamics & genetic variation
- Identify critical habitats & limiting factors
- Research seasonal movements & recolonization capabilities

South Dakota Wildlife Action Plan

Creek Heelsplitter

CRHE

Lasmigona compressa

Description:

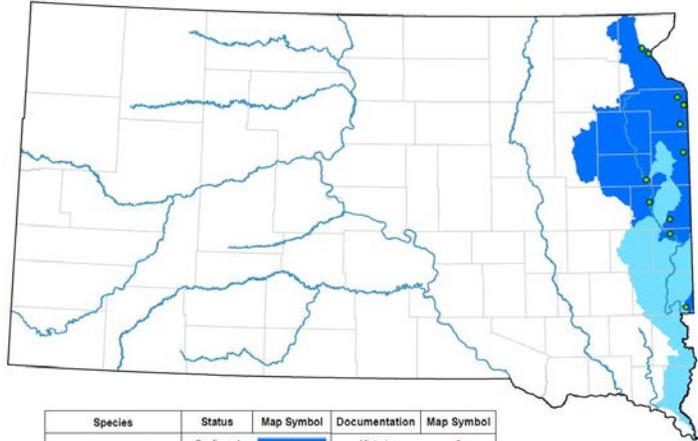
- Small to medium sized mussel under 4 in.
- Relatively thin, elongate shell with lateral teeth
- Outer shell is greenish (young) to greenish-black (adults), sometimes with fine green rays in young mussels

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD- tributaries to the Big Sioux & Minnesota River basins
- SD is on the western periphery of the range for this species



Species	Status	Map Symbol	Documentation	Map Symbol
Creek Heelsplitter	Confirmed	Dark Blue	Historic	Red Dot
	Probable	Light Blue	Current	Green Dot

Key Habitat:

- Prefers headwater streams of small to medium sized rivers with mud or sand substrates

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Impervious surfaces
- Pollution/pesticides/herbicides
 - Concentrated Animal Feeding Operations (CAFOs)
 - Agricultural runoff

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

- Statewide comprehensive mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- Comprehensive aquatics survey of the Minnesota River tributaries – T-17D
- An aquatic invasive species risk assessment for South Dakota – T-36
- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors

South Dakota Wildlife Action Plan

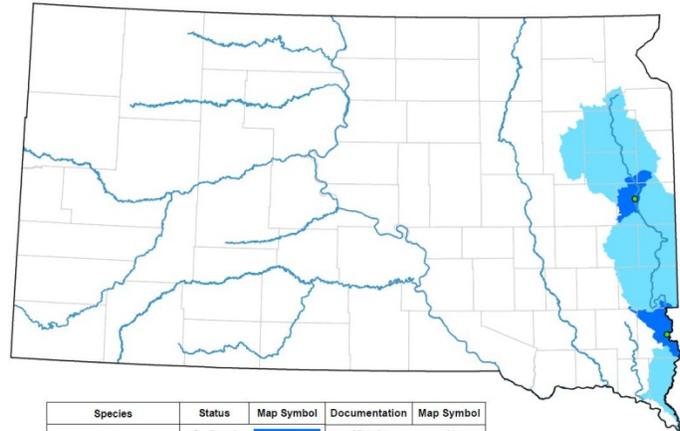
Elktoe

ELKT

Alasmidonta marginata

Description:

- Adults commonly 2.5 to 4 in.
- Small to medium sized mussel with elongate, triangular, inflated, & relatively thin, smooth shell
- Outer shell is yellowish-green in color with numerous dark green rays & spots present
- Sharp angled posterior ridge, poorly developed teeth & heavy beak sculpture



Species	Status	Map Symbol	Documentation	Map Symbol
Elktoe	Confirmed	Dark Blue	Historic	Red dot
	Probable	Light Blue	Current	Green dot

Protection Status:

- Federal: None
- State: None
- Global Rank: G4 (Apparently Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD- tributaries to the Big Sioux River basin
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefers small streams to medium rivers with swift current & sand or gravel substrates

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
 - Impervious surfaces
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
- Water Management Practices
 - Permitted discharges
- Moderately vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

SWG Accomplishments (Appendix F):

- An aquatic invasive species risk assessment for South Dakota – T-36
- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors

South Dakota Wildlife Action Plan

Hickorynut

HICK

Obovaria olivaria

Description:

- Small to medium sized mussel with thick, inflated rounded to oblong shell
- Outer shell is smooth & greenish or yellowish-brown in color

Distribution:

- Eastern SD- tributaries to the James & Big Sioux River basins
- SD is on the northern periphery of the range for this species

Protection Status:

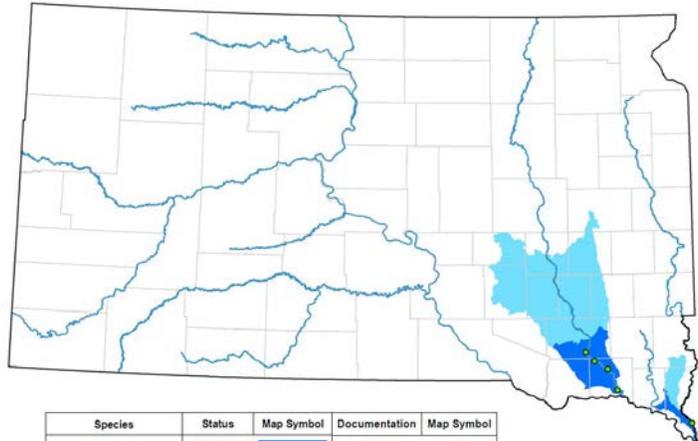
- Federal: None
- State: None
- Global Rank: G4 (Apparently Secure)
- State Rank: S1 (Critically Imperiled)

Key Habitat:

- Prefers large to medium sized rivers with good current with sand or gravel substrates
- Typically found in waters 6 to 8 feet deep

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
 - Permitted discharges
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Impervious surfaces
 - Road stream crossings
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
- Moderately vulnerable to climate change



Species	Status	Map Symbol	Documentation	Map Symbol
Hickorynut	Confirmed	Dark Blue	Historic	Red dot
	Probable	Light Blue	Current	Green dot

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

- Statewide comprehensive mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats

South Dakota Wildlife Action Plan

Higgins Eye

HIEY

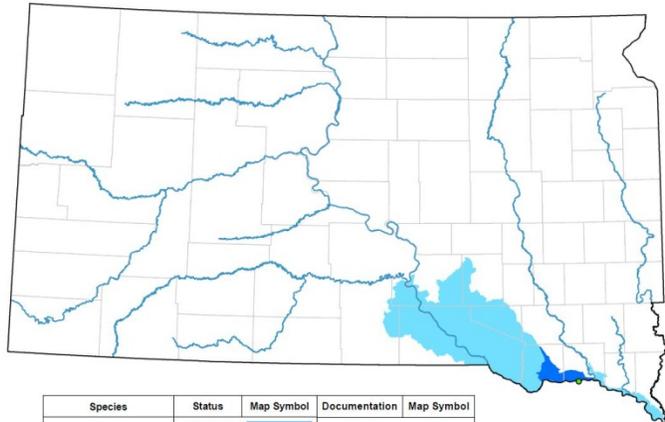
Lampsilis higginsii

Description:

- Small to medium sized mussel with slightly elongate, thick, smooth, inflated shell
- Yellowish-brown color with green rays
- Male has bluntly pointed posterior end

Distribution:

- Southern SD- single specimen collected within the Missouri River basin
- SD is on the northern periphery of the range for this species



Protection Status:

- Federal: Endangered
- State: Take not allowed
- Global Rank: G1 (Critically Imperiled)
- State Rank: S1 (Critically Imperiled)

Key Habitat:

- Prefer medium to large rivers with sand or mud substrates & moderate currents

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Road stream crossings
 - Impervious surfaces
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
 - Permitted discharges
- Highly vulnerable to climate change

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

- Mussel surveys – 39 mile & 59 mile (USACE, SDGFP, NPS)
- Statewide comprehensive mussel survey (SDGFP, SDSU)
- Western prairie streams & rivers mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61

South Dakota Wildlife Action Plan

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Develop a management plan
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors

Existing Recovery Plan/Conservation Strategies:

U.S. Fish and Wildlife Service. 2004. Higgins Eye Pearly mussel Recovery Plan: First Revision. Ft. Snelling, Minnesota. 126 pp.

South Dakota Wildlife Action Plan

Mapleleaf

MAPL

Quadrula quadrula

Description:

- Small to medium mussel with thick, square shell
- Outer shell is yellowish green to brown in color with two rows of raised bumps extending in a v-shape from the beak to ventral margin

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S2 (Imperiled)

Distribution:

- Eastern SD- tributaries to the Missouri, James & Big Sioux River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Can be found in shallow lakes, large rivers or deep reservoirs with sand or fine gravel substrates

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Road stream crossings
 - Impervious surfaces
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
 - Permitted discharges

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

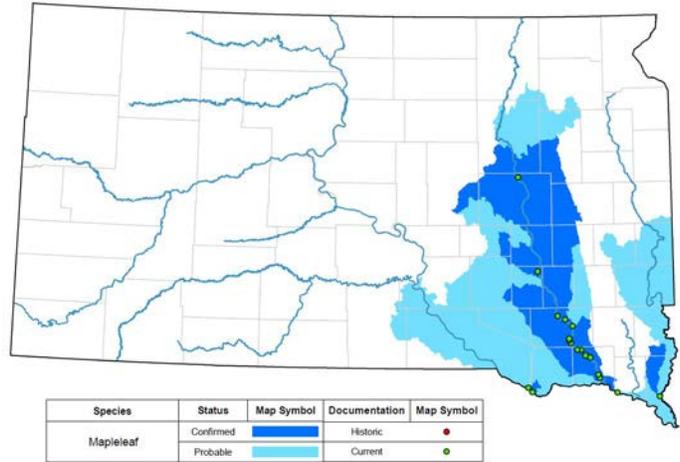
- Mussel surveys – 39 mile & 59 mile (USACE, SDGFP, NPS)
- Statewide comprehensive mussel survey (SDGFP, SDSU)
- Western prairie streams & rivers mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats



South Dakota Wildlife Action Plan

Pimpleback

PIMP

Quadrula pustulosa

Description:

- Small to medium mussel with thick, rounded, & compressed to moderately inflated shell
- Outer shell is yellowish-green to light brown in younger mussels & chestnut to dark brown in older mussels
- Outer shell is relatively smooth on the anterior half & covered with bumps on the posterior half or two-thirds

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD- tributaries to the James and Big Sioux River basins
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefer reservoirs & medium to large rivers with sand, mud or gravel substrates

Conservation Challenges:

- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Watershed destabilization
- Pollution/pesticides/herbicides
 - Degraded water quality
 - CAFOs
 - Agricultural runoff

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

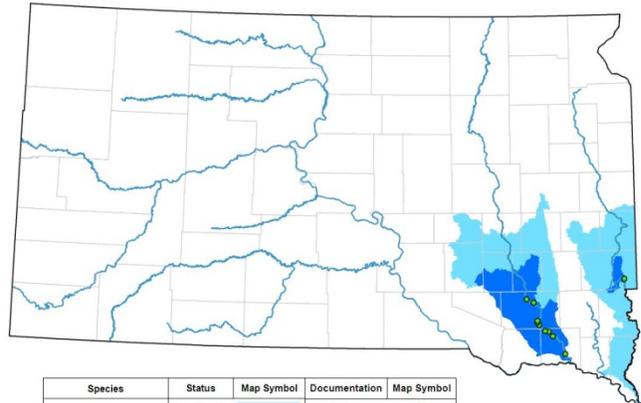
- Statewide comprehensive mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors



South Dakota Wildlife Action Plan

Rock Pocketbook

ROPO

Arcidens confragosus

Description:

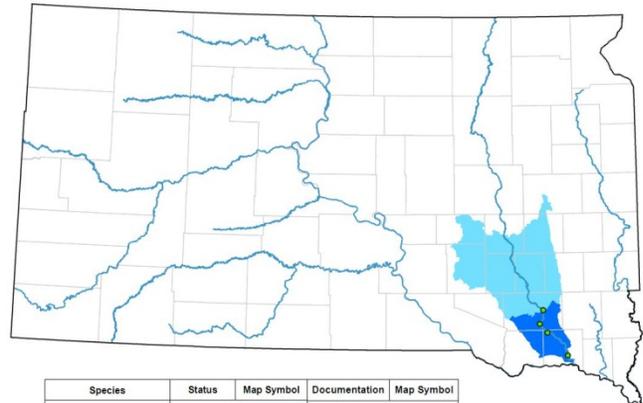
- Large mussel with thin to moderately thick elliptical & inflated shell.
- Outer shell dark green, brown or black.

Protection Status:

- Federal: None
- State: None
- Global Rank: G4 (Apparently Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD- tributaries to the James River basin
- SD is on the northern periphery of the range for this species



Key Habitat:

- Prefers medium to large rivers with standing or slow flowing water with mud or sand substrates

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Impervious surfaces
 - Road stream crossings
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
- Water Management Practices
 - Permitted discharges

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

- Statewide comprehensive mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- An aquatic invasive species risk assessment for South Dakota – T-36
- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors

South Dakota Wildlife Action Plan

Scaleshell

SCAL

Leptodea loptodon

Description:

- Small to medium sized mussel with elongated, compressed, thin, translucent shell.
- Outer shell is smooth & yellowish to brown with faint green rays
- Beak has 4-5 double looped ridges that are sometimes eroded

Protection Status:

- Federal: Endangered
- State: Take not allowed
- Global Rank: G1 (Critically Imperiled)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Southern SD- tributaries to the Missouri River basin
- SD is on the western periphery of the range for this species

Key Habitat:

- Prefer medium to large unpolluted rivers with sand, mud, or gravel substrates
- Occurs in riffles with moderate to high current

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Exotic/introduced species impacts
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Road stream crossings
 - Impervious surfaces
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
 - Permitted discharges
- Highly vulnerable to climate change

Conservation Actions:

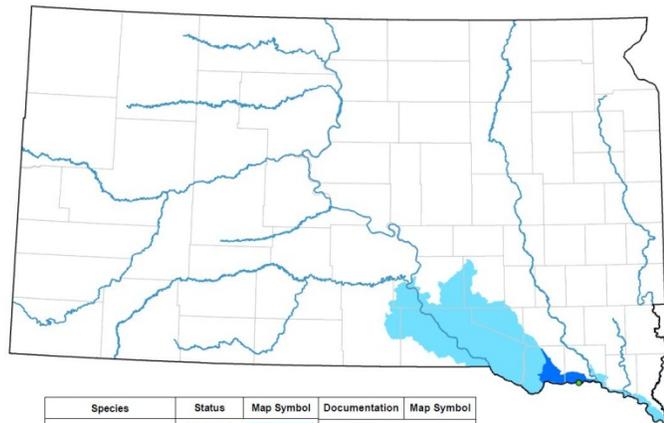
- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

- Mussel surveys – 39 mile & 59 mile (USACE, SDGFP, NPS)
- Statewide comprehensive mussel survey (SDGFP, SDSU)
- Western prairie streams & rivers mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61



South Dakota Wildlife Action Plan

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Develop a management plan
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors

Existing Recovery Plan/Conservation Strategies:

U.S. Fish and Wildlife Service. 2004. Scaleshell Mussel Draft Recovery Plan. U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. 90 pp.

South Dakota Wildlife Action Plan

Yellow Sandshell

YESA

Lampsilis teres

Description:

- Medium sized mussel with thick, inflated & elongated shell
- Shell is smooth, extremely shiny in young mussels becoming dull with age
- Outer shell yellowish in color and lacking rays

Protection Status:

- Federal: None
- State: None
- Global Rank: G5 (Secure)
- State Rank: S1 (Critically Imperiled)

Distribution:

- Eastern SD- tributaries to the James & Big Sioux River basins
- SD is on the northern periphery of the range for this species

Key Habitat:

- Prefers medium to large rivers with low to medium flow & mud or sand substrates

Conservation Challenges:

- Modified flood regimes
 - Major hydrologic alterations
- Ecosystem/habitat conversion or loss
 - Dams
- Ecosystem alteration/habitat degradation
 - Impervious surfaces
- Pollution/pesticides/herbicides
 - CAFOs
 - Agricultural runoff
- Water Management Practices
 - Permitted discharges

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible
- Develop programs to reduce/eliminate the threat of non-native species competing with native mussels

Current Monitoring & Inventory Programs (Appendix E):

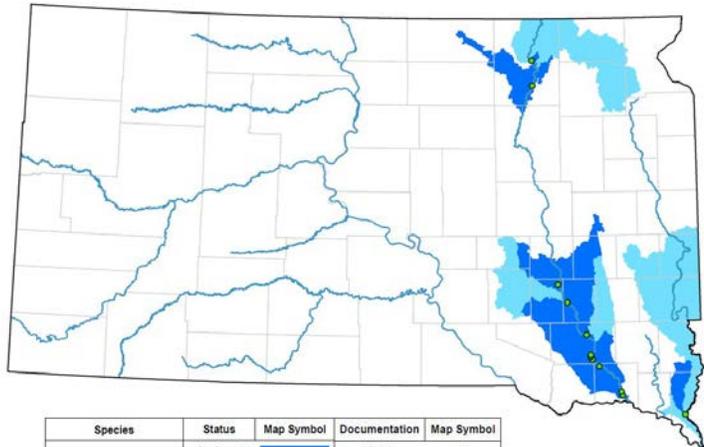
- Statewide comprehensive mussel survey (SDGFP, SDSU)

SWG Accomplishments (Appendix F):

- A population survey of mussels in South Dakota rivers – T-61

Priority Research & Monitoring Needs (Appendices G-K):

- Facilitate a state-wide comprehensive survey and long-term monitoring program for mussels
- Conduct research on life history, reproductive behaviors & potential
- Identify suitable & critical habitats
- Identify limiting factors



South Dakota Wildlife Action Plan

A Mayfly

ANEX

Analetris eximia

Description:

- Mayfly, color markings on abdomen are similar between adult & nymph stages
- Adults have small, distinct white projection between fore-coxae, with smaller projection between mid-coxae
- Distinct semi-membranous spine on each side postero-dorsally to the front coxae
- Front to hind wing length ratio 7.5:4
- Longitudinal veins slightly pigmented with black, crossveins & wing membrane colorless

Protection Status:

- Federal: None
- State: None
- Global Rank: G3 (Vulnerable)
- State Rank: SNR (Not ranked)

Distribution:

- South Dakota distribution unknown
- Reports suggest native to the Upper Missouri River basin (NatureServe)
- South Dakota is on the eastern periphery of the range for this species

Key Habitat:

- Confined to backwaters of low gradient creeks to medium rivers with shifting sand substrates

Conservation Challenges:

- Ecosystem/habitat conversion or loss
 - Impoundments
 - Channelization
- Ecosystem alteration/habitat degradation
 - Increased turbidity & siltation of stream bottoms
- Pollution/pesticides/herbicides
 - Increased turbidity
- Grazing/Agricultural practices
 - Heavy grazing practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory & surveys (SDGFP, SDSU)

Priority Research & Monitoring Needs (Appendices G-K):

- Establish baseline distribution & current status data through monitoring efforts
- Identify suitable & critical habitats
- Conduct research on life history requirements
- Identify limiting factors

South Dakota Wildlife Action Plan

Dakota Stonefly

PEDA

Perlesta dakota

Description:

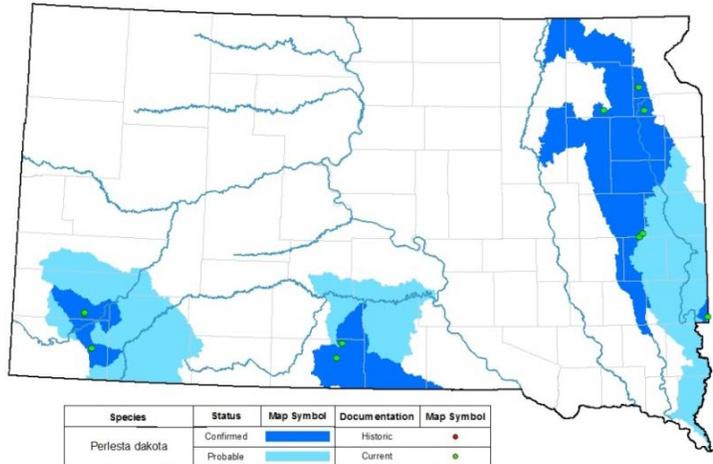
- Stonefly

Protection Status:

- Federal: None
- State: None
- Global Rank: G3 (Vulnerable)
- State Rank: SNR (Not ranked)

Distribution:

- Southern & Eastern SD- tributaries to the Cheyenne, White, & Big Sioux River basins
- Species range almost entirely isolated to South Dakota with only 3 records from North Dakota



Key Habitat:

- Small streams or rivers with low flow
- Adults prefer overhanging riparian vegetation

Conservation Challenges:

- Ecosystem/habitat conversion or loss
 - Impoundments
 - Channelization
- Ecosystem alteration/habitat degradation
 - Increased turbidity & siltation of stream bottoms
 - Pollution/pesticides/herbicides
 - Increased turbidity
- Grazing/Agricultural practices
 - Heavy grazing practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory & surveys (SDGFP, SDSU)

Priority Research & Monitoring Needs (Appendices G-K):

- Establish baseline distribution & current status data through monitoring efforts
- Identify suitable & critical habitats
- Conduct research on life history requirements
- Identify limiting factors

South Dakota Wildlife Action Plan

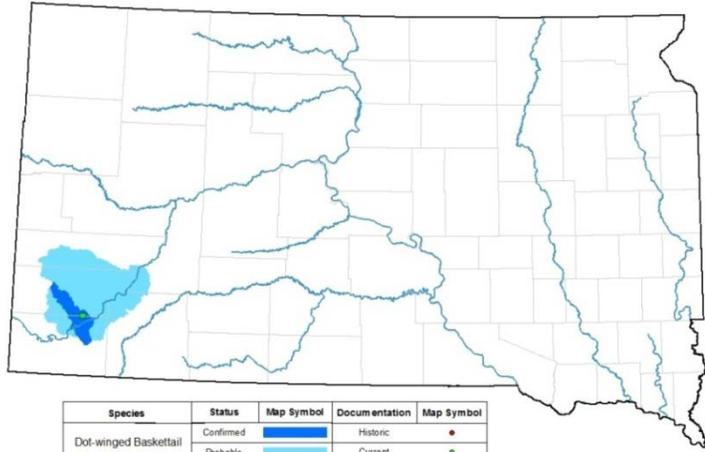
Dot-winged Baskettail

EPPE

Epitheca petechialis

Description:

- Dragonfly-baskettail
- Brown with yellow spots along sides of slender abdomen
- Distinct row of brown spots on the leading edge of hindwings, however sometimes not prevalent
- SIMILAR SPECIES: Slender Baskettail



Protection Status:

- Federal: None
- State: None
- Global Rank: G4 (Apparently Secure)
- State Rank: SNR (Not ranked)

Distribution:

- Western SD-tributaries to the Cheyenne River basins
- South Dakota is on the northern edge of this species range

Key Habitat:

- Lakes, ponds, & low flow streams

Conservation Challenges:

- Ecosystem/habitat conversion or loss
 - Impoundments
 - Channelization
- Ecosystem alteration/habitat degradation
 - Increased turbidity & siltation of stream bottoms
- Pollution/pesticides/herbicides
 - Increased turbidity
- Grazing/Agricultural practices
 - Heavy grazing practices

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff

Current Monitoring & Inventory Programs (Appendix E):

- Western prairie streams & rivers inventory & surveys (SDGFP, SDSU)

Priority Research & Monitoring Needs (Appendices G-K):

- Establish baseline distribution & current status data through monitoring efforts
- Identify suitable & critical habitats
- Conduct research on life history requirements
- Identify limiting factors

South Dakota Wildlife Action Plan

Elusive Clubtail-A Dragonfly

STNO

Stylurus notatus

Description:

- Slender, greenish-yellow dragonfly with brown stripes on the thorax
- Abdomen has 8-9 segments with large pale green to yellow spots on the sides

Protection Status:

- Federal: None
- State: None
- Global Rank: G3 (Vulnerable)
- State Rank: SNR (Not ranked)

Distribution:

- South Dakota distribution unknown
- South Dakota is on the western periphery of the range for this species

Key Habitat:

- Prefers large rivers with moderate flow and sand or gravel substrates, also found in lakes
- Adults patrol open waters or perch from treetops making sightings extremely rare

Conservation Challenges:

- Ecosystem/habitat conversion or loss
- Ecosystem alteration/habitat degradation
 - Increased siltation of stream bottoms
 - Impoundments
 - Channelization
- Pollution/pesticides/herbicides
 - Increased turbidity
- Grazing/Agricultural practices
 - Heavy grazing practices
- Forest Management Practices
 - Logging

Conservation Actions:

- Increase partnerships & cooperative arrangements
- Increase educational efforts
- Promote management practices that reduce/limit soil erosion & nutrient/pesticide runoff
- Maintain/restore natural hydrology & stream connectivity when possible

Priority Research & Monitoring Needs (Appendices G-K):

- Establish baseline distribution & current status data through monitoring efforts
- Identify suitable & critical habitats
- Conduct research on life history requirements
- Identify limiting factors

South Dakota Wildlife Action Plan

Appendix D. Species codes used in South Dakota Wildlife Action Plan.

Common Name	Scientific Name	Species Code
BIRDS		
American Dipper	<i>Cinclus mexicanus</i>	AMDI
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	ATTW
American White Pelican	<i>Pelecanus erythrorhynchos</i>	AWPE
Baird's Sparrow	<i>Ammodramus bairdii</i>	BAIS
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BAEA
Black Tern	<i>Chlidonias niger</i>	BLTE
Black-backed Woodpecker	<i>Picoides arcticus</i>	BBWO
Burrowing Owl	<i>Athene cunicularia</i>	BUOW
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	CCLO
Ferruginous Hawk	<i>Buteo regalis</i>	FEHA
Greater Prairie-Chicken	<i>Tympanuchus cupido</i>	GRPC
Greater Sage-Grouse	<i>Centrocercus urophasianus</i>	SAGR
Interior Least Tern	<i>Sternula antillarum athalassos</i>	LETE
Lark Bunting	<i>Calamospiza melanocorys</i>	LARB
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	LCSP
Lewis's Woodpecker	<i>Melanerpes lewis</i>	LEWO
Long-billed Curlew	<i>Numenius americanus</i>	LBCU
Marbled Godwit	<i>Limosa fedoa</i>	MAGO
Northern Goshawk	<i>Accipiter gentilis</i>	NOGO
Osprey	<i>Pandion haliaetus</i>	OSPR
Peregrine Falcon	<i>Falco peregrinus</i>	PEFA
Piping Plover	<i>Charadrius melodus</i>	PIPL
Ruffed Grouse	<i>Bonasa umbellus</i>	RUGR
Sprague's Pipit	<i>Anthus spragueii</i>	SPPI
Trumpeter Swan	<i>Cygnus buccinator</i>	TRUS
White-winged Junco	<i>Junco hyemalis aikeni</i>	WWJU
Whooping Crane	<i>Grus americana</i>	WHCR
Willet	<i>Tringa semipalmata</i>	WILL
Wilson's Phalarope	<i>Phalaropus tricolor</i>	WIPH
GASTROPODS		
Callused (Dakota) Vertigo	<i>Vertigo arthuri</i>	DAVE
Cooper's Rocky Mountainsnail	<i>Oreohelix strigosa cooperi</i>	CRMO
Frigid Ambersnail	<i>Catinella gelida</i>	FRAM

South Dakota Wildlife Action Plan

Appendix D (continued). Species codes used in South Dakota Wildlife Action Plan.

Mystery Vertigo	<i>Vertigo paradoxa</i>	MYVE
AMPHIBIANS AND REPTILES		
Black Hills Redbelly Snake	<i>Storeria occipitomaculata pahasapae</i>	BHRS
Blanchard's Cricket Frog	<i>Acris blanchardi</i>	BCFR
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	CGTR
Eastern Hognose Snake	<i>Heterodon platirhinos</i>	EHSN
False Map Turtle	<i>Graptemys pseudogeographica</i>	FMTU
Lesser Earless Lizard	<i>Holbrookia maculata</i>	LELI
Lined Snake	<i>Tropidoclonion lineatum</i>	LISN
Many-lined Skink	<i>Plestiodon multivirgatus</i>	MLSK
Sagebrush Lizard	<i>Sceloporus graciosus</i>	SALI
Short-horned Lizard	<i>Phrynosoma hernandesi</i>	SHLI
Smooth Softshell	<i>Apalone mutica</i>	SMSO
Western (Ornate) Box Turtle	<i>Terrapene ornata</i>	WBTU
MAMMALS		
Black-footed Ferret	<i>Mustela nigripes</i>	BFFE
Black Hills Red Squirrel	<i>Tamiasciurus hudsonicus dakotensis</i>	BHSQ
Franklin's Ground Squirrel	<i>Poliocitellus franklinii</i>	FGSQ
Fringe-tailed Myotis	<i>Myotis thysanodes pahasapensis</i>	FTMY
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	NFSQ
Northern Myotis	<i>Myotis septentrionalis</i>	NOMY
Northern River Otter	<i>Lontra canadensis</i>	NROT
Richardson's Ground Squirrel	<i>Urocitellus richardsonii</i>	RGSQ
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	SHBA
Swift Fox	<i>Vulpes velox</i>	SWFO
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	TBBA
TERRESTRIAL INSECTS		
American Burying Beetle	<i>Nicrophorus americanus</i>	AMBE
Dakota Skipper	<i>Hesperia dacotae</i>	DASK
Great Plains Tiger Beetle	<i>Amblycheila cylindriiformis</i>	GPTB
Indian Creek Tiger Beetle	<i>Cicindela nevadica makosika</i>	ICTB
Iowa Skipper	<i>Atrytone arogos iowa</i>	IOSK
Little White Tiger Beetle	<i>Cicindela lepida</i>	LWTB
Northern Sandy Tiger Beetle	<i>Cicindela limbata nympa</i>	NSTB
Ottoo Skipper	<i>Hesperia ottoe</i>	OTSK
Pahasapa Fritillary	<i>Speyeria atlantis pahasapa</i>	PAFR

South Dakota Wildlife Action Plan

Appendix D (continued). Species codes used in South Dakota Wildlife Action Plan.

Poweshiek Skipperling	<i>Oarisma poweshiek</i>	POSK
Regal Fritillary	<i>Speyeria idalia</i>	REFR
AQUATIC INSECTS		
A Mayfly	<i>Anaetris eximia</i>	ANEX
Dakota Stonefly	<i>Perlesta dakota</i>	PEDA
Dot-winged Baskettail	<i>Epithea petechialis</i>	EPPE
Elusive Clubtail	<i>Stylurus notatus</i>	STNO
FRESHWATER MUSSELS		
Creek Heelsplitter	<i>Lasmigona compressa</i>	CRHE
Elktoe	<i>Alasmidonta marginata</i>	ELKT
Hickorynut	<i>Obovaria olivaria</i>	HICK
Higgins Eye	<i>Lampsilis higginsii</i>	HIEY
Mapleleaf	<i>Quadrula quadrula</i>	MAPL
Pimpleback	<i>Quadrula pustulosa</i>	PIMP
Rock Pocketbook	<i>Arcidens confragosus</i>	ROPO
Scaleshell	<i>Leptodea leptodon</i>	SCAL
Yellow Sandshell	<i>Lampsilis teres</i>	YESA
FISHES		
Banded Killifish	<i>Fundulus diaphanus</i>	BAKI
Blacknose Shiner	<i>Notropis heterolepis</i>	BLSH
Blackside Darter	<i>Percina maculata</i>	BLDA
Blue Sucker	<i>Cycleptus elongatus</i>	BLSU
Carmine Shiner	<i>Notropis percobromus</i>	CASH
Central Mudminnow	<i>Umbra limi</i>	CEMU
Finescale Dace	<i>Chrosomus neogaeus</i>	FIDA
Hornyhead Chub	<i>Nocomis biguttatus</i>	HOCH
Lake Chub	<i>Couesius plumbeus</i>	LACH
Logperch	<i>Percina caprodes</i>	LOGP
Longnose Sucker	<i>Catostomus catostomus</i>	LOSU
Mountain Sucker	<i>Catostomus platyrhynchus</i>	MOSU
Northern Pearl Dace	<i>Margariscus nachtriebi</i>	NPDA
Northern Redbelly Dace	<i>Chrosomus eos</i>	NRDA
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	PAST
Shovelnose Sturgeon	<i>Scaphirhynchus platyrhynchus</i>	SHST
Sicklefin Chub	<i>Macrhybopsis meeki</i>	SICH
Southern Redbelly Dace	<i>Chrosomus erythrogaster</i>	SRDA
Sturgeon Chub	<i>Macrhybopsis gelida</i>	STCH
Topeka Shiner	<i>Notropis topeka</i>	TOSH
Trout-perch	<i>Percopsis omiscomaycus</i>	TRPE

South Dakota Wildlife Action Plan

Appendix E. Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

MONITORING/INVENTORY PROGRAM and TIMEFRAME (Efforts are ongoing unless otherwise indicated.)	PRIMARY AGENCY/ORGANIZATION	DESCRIPTION
BIRDS		
North America Breeding Bird Surveys	U.S. Geological Survey and cooperating agencies, tribes and volunteers	Status and trends of bird populations
Christmas Bird Count	National Audubon Society and cooperating NAS chapters, agencies, tribes and volunteers	Status and trends of bird populations
Breeding waterfowl survey	U.S. Fish and Wildlife Service	Estimates of waterfowl numbers by species
South Dakota Breeding Bird Atlas 2 (2008-2014)	SD Ornithologists' Union and SD Game, Fish, and Parks (SDGFP)	Determine the abundance and distribution of breeding birds in South Dakota 20 years after initial atlas project
Trumpeter Swan	U.S. Fish and Wildlife Service and NE Game and Parks Commission	Annual fall survey to determine production and distribution for portion of Interior Population of High Plains Flock
Bird banding – Farm Island and Oahe Downstream, South Dakota	SDGFP	Migratory bird occurrence and abundance data
Colonial Waterbird Inventory and Monitoring Program (5- to 10-year rotation or as funding allows)	Rocky Mountain Bird Observatory and SDGFP	Census of waterbirds in South Dakota on a 5-10 year rotational basis
Monitoring Avian Productivity and Survivorship (MAPS) Program	The Institute for Bird Populations	Monitor population dynamics of over 120 species of land birds (as of 2013, one station in Brookings County, South Dakota)

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

Bald Eagle Midwinter Survey	SDGFP, Nebraska Game and Parks Commission, U.S. Fish and Wildlife Service and U.S.G.S.	Annual winter population surveys on standardized routes along Missouri River
Bald Eagle Nest Surveys (conducted at 2- to 3-year intervals)	SDGFP, U.S. Fish and Wildlife Service, and other participants	Biennial surveys of bald eagle nest occurrences and success
Least Tern and Piping Plover Nesting Surveys	U.S. Army Corps of Engineers and SDGFP	Annual surveys of nest colony locations and success
Whooping Crane Migration Monitoring	SDGFP, U.S. Fish and Wildlife Service	Collect information on migrating whooping cranes to assure their safe passage through the state
Seasonal Bird Observation Report System	Dakota State University and South Dakota Ornithologists' Union	Seasonal reporting and publication of bird observations and nest records, including verified reports of rare bird species
Northern Goshawk Nesting Surveys (conducted at 2- to 3-year intervals)	Black Hills National Forest	Determine locations of known territories and nests to monitor population status
Project FeederWatch	Cornell Lab of Ornithology	Annual volunteer-based monitoring of winter feeding birds
Project NestWatch	Cornell Lab of Ornithology	Annual volunteer-based monitoring of bird nests.
Great Backyard Bird Count	Cornell Lab of Ornithology, National Audubon Society, Bird Studies Canada	Annual volunteer-based monitoring of backyard birds during mid-February
eBird	Cornell Lab of Ornithology and National Audubon Society	Online system that allows birders to keep track of their bird sightings and lists. Data used to monitor bird species occurrences and patterns
Sage-Grouse lek surveys	SD Game, Fish and Parks, Forest Service, Bureau of Land Management	Counts of males on priority leks. Periodic counts of all males on all known leks.

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

Sharp-tailed Grouse and Greater Prairie-Chicken lek surveys	Forest Service, South Dakota Game, Fish and Parks and Fish and Wildlife Service.	Lek counts on 10, 40 mile ² survey blocks and established blocks within the Fort Pierre National Grassland. Listening surveys are also completed on 33 established routes. Additional surveys conducted throughout western South Dakota.
Integrated Monitoring in Bird Conservation Regions (IMBCR)	Rocky Mountain Bird Observatory	Monitor bird populations and trends from local to regional scales. West River only.
Turkey Management Surveys <ul style="list-style-type: none"> • turkey brood survey • turkey harvest survey • turkey trapping and transfer • turkey winter flock counts 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations
Turkey Management Surveys <ul style="list-style-type: none"> • brood survey • harvest survey 	Lower Brule Sioux Tribe	Determine current status and trends and estimate harvest annually through questionnaires.
Pheasant Management Surveys <ul style="list-style-type: none"> • pheasant brood surveys • pheasant winter sex ratio surveys 	SDGFP	Determine current status and trends, population composition, and appropriate hunting regulations.
Pheasant Management Surveys <ul style="list-style-type: none"> • brood survey • harvest survey • wing collection 	Lower Brule Sioux Tribe	Determine current status and trends, estimate harvest annually through questionnaires and estimate hatching dates.
Grouse Management Surveys <ul style="list-style-type: none"> • sharp-tailed grouse and prairie chicken spring lek survey • sharp-tailed grouse and prairie chicken harvest field survey • sage grouse spring survey and lek inventory • sage grouse hunter harvest survey 	SDGFP	Determine current status and trends, population composition, appropriate hunting regulations, and extent of utilization and recreation.

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

<p>Sharp-tailed grouse and greater prairie-chicken Management Surveys</p> <ul style="list-style-type: none"> • lek survey • harvest survey • wing collection 	Lower Brule Sioux Tribe	Determine current status and trends, estimate harvest annually through questionnaires, and estimate hatching dates.
<p>Gray Partridge Management Surveys</p> <ul style="list-style-type: none"> • gray partridge harvest survey 	SDGFP	Determine current status and trends, population composition, appropriate hunting regulations, and extent of utilization and recreation.
<p>Quail Management Surveys</p> <ul style="list-style-type: none"> • quail whistle count survey 	SDGFP	Determine current status and trends, population composition, and appropriate hunting regulations.
<p>Waterfowl Management Surveys</p> <ul style="list-style-type: none"> • surveys of migrating and wintering waterfowl 	SDGFP	Determine current status and trends, population composition, and appropriate hunting regulations.
<p>Waterfowl Management Surveys</p> <ul style="list-style-type: none"> • migration survey • harvest survey 	Lower Brule Sioux Tribe	Estimate numbers of migrating waterfowl and estimate harvest annually through questionnaires.
<p>Banding and Band Recovery Analysis of Migratory Birds</p>	SDGFP	Determine current status and trends, population composition, appropriate hunting regulations, and extent of utilization and recreation.
<p>Small Game Harvest Survey</p> <ul style="list-style-type: none"> • upland game bird and waterfowl nesting success survey 	SDGFP	Determine extent of utilization and recreation.
<p>Game Bird Nesting Success Surveys</p>	SDGFP	Determine current status and trends, population composition, and appropriate hunting regulations.
<p>Mourning Dove Surveys</p> <ul style="list-style-type: none"> • mourning dove call-count survey 	SDGFP	Determine current status and trends and population composition.

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

Mourning Dove Management Surveys <ul style="list-style-type: none">roadside surveyharvest survey	Lower Brule Sioux Tribe	Determine current status and trends and estimate harvest annually through questionnaires.
Wildlife Mortality Investigations	SDGFP	Determine the presence and extent of diseases, parasites and other health anomalies that occur in the state's wildlife populations, and to initiate necessary and timely steps to clean-up or reduce abnormally large die-offs. (Also pertains to mammals).
Raptor Surveys <ul style="list-style-type: none">inventory of nesting raptorssurvey of wintering raptors on Fort Pierre National Grasslandnational park-specific surveys	SDGFP, U.S. Forest Service and Wind Cave National Park	Status and trend surveys
Raptor Surveys <ul style="list-style-type: none">winter aerial surveynest survey	Lower Brule Sioux Tribe	Status and trends of wintering raptors and monitor success of bald and golden eagle nests.
Shorebird surveys	USFWS and cooperators	Develop broad-scale habitat models and maps to monitor populations and guide conservation efforts
Use of video cameras to identify prey selection of northern harriers, ferruginous hawks, golden eagles, and Swainson's hawks in the northern Great Plains (2012-2016)	SDSU Agricultural Experiment Station and USFWS	Document prey selection of these raptor species in SD and ND.
Annual bird surveys	National parks in SD	Part of Inventory and Monitoring Network
Grouse lek surveys	Wind Cave National Park	Status and trend surveys
Off-road breeding bird surveys	Wind Cave National Park	Status and trend surveys

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

Nightjar survey (Nightjar Survey Network)	Center for Biological Diversity and volunteers	Volunteer-based status and trend survey
MAMMALS		
Monitoring of Black Hills bats	SDGFP, BatWorks, Jewel Cave National Monument and Wind Cave National Park	Status and trend surveys
Black-tailed Prairie Dog distribution surveys	U.S. Forest Service and Wind Cave National Park	Status and trend surveys; WCNP monitors ½ of the colonies each year
Black-tailed Prairie Dog acreage survey	SDGFP	Statewide acreage estimation conducted at 3-year intervals
Black-tailed Prairie Dog management and surveys <ul style="list-style-type: none"> • colony mapping • windshield survey • harvest survey • insecticide application 	Lower Brule Sioux Tribe	Estimate number and size of colonies and complexes, monitor colony activity related to plague occurrence, estimate harvest annually through questionnaires and apply deltamethrin to minimize plague occurrence.
Sylvatic Plague monitoring	SDGFP and other cooperators	Monitor distribution and prevalence of sylvatic plague in South Dakota
River Otter distribution	SDGFP	Monitor species occurrence and evaluate need for reintroduction
Deer Management Surveys <ul style="list-style-type: none"> • deer harvest survey • detectability survey 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations
Deer Management Surveys <ul style="list-style-type: none"> • winter aerial survey • spotlight survey • age structure analysis • CWD and EHD monitoring 	Lower Brule Sioux Tribe	Estimate population size, recruitment, sex ratios and age structure. Estimate harvest annually through questionnaires. Monitor occurrence of CWD and EHD.
Pronghorn Management Surveys <ul style="list-style-type: none"> • spring aerial survey • fall recruitment survey • pronghorn harvest survey 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

Pronghorn Surveys	Wind Cave National Park	Status and trend surveys
Elk Counts	Wind Cave National Park	Status and trend surveys
Pronghorn Management Surveys <ul style="list-style-type: none"> • winter aerial survey • summer aerial survey • harvest survey 	Lower Brule Sioux Tribe	Estimate population size, recruitment and sex ratios. Estimate harvest annually from questionnaires.
Elk Management Surveys <ul style="list-style-type: none"> • elk aerial sightability survey • elk harvest age structure • fall herd composition survey • elk harvest survey 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations
Elk Management Surveys <ul style="list-style-type: none"> • ground survey • harvest survey • CWD monitoring 	Lower Brule Sioux Tribe	Estimate population size, recruitment and sex ratios, record annual harvest and monitoring CWD occurrence.
Mountain Goat Management Surveys <ul style="list-style-type: none"> • mountain goat aerial survey • hunter orientation and biological data of mountain goats 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations
Bighorn Sheep Management Surveys <ul style="list-style-type: none"> • bighorn sheep population surveys • hunter orientation and biological data of bighorn sheep • bighorn sheep trap, transfer and monitoring 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

<p>Mountain Lion Management Surveys</p> <ul style="list-style-type: none"> • mountain lion harvest reporting • mountain lion mortality • mountain lion population trend surveys • mountain lion observation reporting 	SDGFP	Determine population and harvest information to assist in making and evaluating management decisions, including hunting regulations
<p>Furbearer Harvest Surveys</p> <ul style="list-style-type: none"> • fur dealer survey 	SDGFP	Determine furbearer population and harvest data to guide furbearer management programs.
<p>Furbearer Management Surveys</p> <ul style="list-style-type: none"> • winter aerial survey • harvest survey 	Lower Brule Sioux Tribe	Monitor status and trends of coyotes and estimate harvest annually through questionnaires.
<p>Bobcat Management Surveys</p> <ul style="list-style-type: none"> • age, sex and reproductive characteristics of harvested bobcat 	SDGFP	Determine bobcat population and harvest data to guide furbearer management programs.
<p>Reintroduced populations of Swift Fox</p>	Badlands National Park	Monitor success of reintroductions re: establishment of self-sustaining populations
<p>Reintroduced populations of Black-footed Ferrets</p> <ul style="list-style-type: none"> • Spotlight survey • Vaccinate against plague and other diseases 	Forest Service, National Park Service, Cheyenne River Sioux Tribe, Rosebud Sioux Tribe, Lower Brule Sioux Tribe, U.S. Fish and Wildlife Service	Monitor success of reintroductions re: establishment of self-sustaining populations.
<p>Bison Management Surveys</p> <ul style="list-style-type: none"> • ground survey • harvest survey 	Lower Brule Sioux Tribe	Estimate population size, recruitment and sex ratios. Record annual harvest.
<p>Small Game Harvest Surveys</p> <ul style="list-style-type: none"> • cottontails and squirrels 	SDGFP	<p>Surveys of hunters conducted at regular intervals to monitor harvest</p> <p>http://gfp.sd.gov/hunting/harvest/default.aspx</p>

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

FRESHWATER MUSSELS		
Mussel surveys – 39 mile and 59 mile (5-year intervals or as funding allows)	Missouri River USCOE Districts SD Game, Fish and Parks; National Park Service; US Army Corps of Engineers	Status and trend surveys – 5 year recurrence
Statewide comprehensive mussel survey (2014-2016)	SDGFP and South Dakota State University	Distribution, abundance, and status survey
Western prairie streams and rivers inventory survey	SDGFP and South Dakota State University	Monitor and inventory species assemblage structure
Zebra and quagga mussel surveys	Bureau of Reclamation	Monitoring and detection program at reservoirs
GASTROPODS		
Black Hills land snail surveys	Black Hills National Forest	Monitor species occurrence and trends
INSECTS		
American Burying Beetle population surveys (5-year intervals or as funding allows)	SDGFP, U.S. Fish and Wildlife Service, and volunteers	Periodically monitor species occurrence, trends, and state distribution
Dakota skipper and Poweshiek skipperling population surveys	SDGFP and U.S. Fish and Wildlife Service	Monitor species occurrence, abundance, relationship to management practices, and state distribution
Mosquito surveys	SD Department of Health, South Dakota State University, Northern State University, various communities	Survey and monitor distribution and abundance of mosquito populations, with special emphasis on <i>Culex tarsalis</i> , the most common West Nile Virus vector in SD
AQUATIC INVERTEBRATES		
Western prairie streams and rivers inventory and surveys	SDGFP and South Dakota State University	Monitor and inventory species assemblage structure

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

FISHES		
Topeka Shiner population monitoring (3-year intervals)	SDGFP	Monitor species occurrence and trends – 3-year recurrence
Lakes and rivers fisheries surveys	SDGFP	Monitor species occurrence and trends
Missouri River reservoir and Fort Pierre National Grassland fisheries surveys	SDGFP	Monitor species occurrence – recurrence manage on water-specific basis and rotation
Western prairie streams and rivers inventory surveys	SDGFP and South Dakota State University	Monitor and inventory species assemblage structure
Lower Missouri River Fish Surveys	U.S. Army Corps of Engineers, SDGFP, U.S. Fish and Wildlife Service	Monitor species occurrence and trends, with emphasis on pallid sturgeon re: success of reintroduction efforts
Fish Management Surveys and Management <ul style="list-style-type: none"> • fisheries survey • harvest survey • fish stocking • paddlefish harvest 	Lower Brule Sioux Tribe	Survey and stock small impoundments, estimate harvest annually through questionnaires
AMPHIBIANS AND REPTILES		
Turtle monitoring, Missouri National Recreational River below Fort Randall and Gavins Point dams	National Park Service, Nebraska Game and Parks Commission	Monitor species occurrence and trends
Wild Turtles Inventory (2002-2003)	SDGFP and cooperators	Statewide inventory of 9 turtle species
Reptile and Amphibian surveys (2003-2005)	SDGFP and cooperators	Species occurrence

South Dakota Wildlife Action Plan

Appendix E (continued). Summary of aquatic and terrestrial species-level monitoring programs in South Dakota, as of 2013.

EFFORTS THAT CROSS ANIMAL GROUPS OR APPLY TO MULTIPLE HABITAT TYPES:

- SD Natural Heritage Program Monitored Species: Collections, observations, nests locations, etc., of monitored species to document species occurrences to facilitate species and habitat conservation and to assist with environmental review.
- Aquatic Invasive Species Management Plan Implementation: Detect and address AIS issues in South Dakota.

South Dakota Wildlife Action Plan

Appendix F. List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

Project title, identifier and status	Objectives	PI or contractor
<p>Survey of animal species of greatest conservation needs at representative public areas in South Dakota</p> <p>T-2-R-1</p> <p>completed 2004</p>	<ol style="list-style-type: none"> 1. survey animal species of greatest conservation need at three publicly-owned areas in eastern SD 2. draw attention to species of concern and methods used to conduct biological surveys 3. compile set of survey protocols that have application to future taxa surveys in SD 	<p>Ken Higgins, SDSU, Coop. Unit</p>
<p>Black-backed and Lewis's woodpeckers responses to fire; can post-burn use be predicted using pre-burn forest structure variables?</p> <p>T-3-R-1</p> <p>completed 2005</p>	<ol style="list-style-type: none"> 1. determine the validity of a black-backed woodpecker model predicting occurrence in a burned site based on pre-fire forest structure 2. determine the response of other woodpecker species to fire 3. quantify habitat characteristics of nest sites compared to random sites to determine habitat preferences of breeding woodpeckers 	<p>Kerri Vierling, SD School of Mines and Technology</p>
<p>Enhance wildlife habitat provided by aspen in Custer State Park</p> <p>T-4-R-1</p> <p>completed 2004</p>	<p>Protect/enhance essential habitats for wildlife species by treating at least 40 aspen clones</p>	<p>Gary Brundige, CSP, SDGFP</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>An evaluation of nesting success of grassland birds in fragmented and unfragmented areas in the mixed grass prairie region of South Dakota, with emphasis on declining grassland species</p> <p>T-5-R-1</p> <p>completed 2006</p>	<ol style="list-style-type: none"> 1. to evaluate the relationship between nest density and grassland patch size and landscape composition 2. to evaluate the relationship between nest success and grassland patch size and landscape composition 3. to evaluate the relationship between nest predation and parasitism and grassland patch size and landscape composition 4. to determine the most effective size of grassland patches for bird conservation areas in eastern South Dakota 5. to determine habitat requirements for Le Conte's and Henslow's sparrows, if encountered 6. to record species of concern from all taxa encountered during research 	<p>Kristel Bakker, DSU and Ken Higgins, SDSU, Coop. Unit</p>
<p>Development of South Dakota's comprehensive wildlife conservation plan</p> <p>T-6-R-1</p> <p>completed 2005</p>	<p>Complete the South Dakota wildlife comprehensive plan by September 30, 2005</p>	<p>Jon Haufler, Ecosystem Management Research Institute</p>
<p>Ecology of the Black Hills redbelly snake (<i>Storeria occipitomaculata pahasapae</i>) with emphasis on food habits</p> <p>T-7-R-1</p> <p>completed 2006</p>	<ol style="list-style-type: none"> 1. determine seasonal activity, reproductive characteristics, relative body size, habitat selection, population characteristics, distribution, and food habits of the Black Hills redbelly snake 2. determine if there is an association between prey selection and abundance of prey and whether prey abundance is influencing the Black Hills redbelly snake population 	<p>Chuck Dieter, SDSU</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Herpetology surveys for South Dakota Comprehensive Wildlife Conservation Plan</p> <p>T-8-R-1</p> <p>completed 2005</p>	<p>By January 30, 2005, survey ten priority habitats for all species of reptiles and amphibians; these surveys will focus on species of concern and state listed species of amphibians and reptiles</p>	<p>Many (10 total)</p>
<p>Evaluation of a decision support tool to help support fish species at risk in South Dakota streams</p> <p>T-9-R-1</p> <p>completed 2006</p>	<ol style="list-style-type: none"> 1. assess the accuracy of models to validate their use as decision support tools 2. increase data on distributions of fish species focusing on 9 species of concern 3. obtain data on the habitat and community associations of 9 fish species of concern 	<p>Chuck Berry, SDSU, Coop. Unit</p>
<p>Reintroduction of osprey into suitable sites along the Missouri River in South Dakota</p> <p>T-10-R-1</p> <p>completed 2010</p>	<ol style="list-style-type: none"> 1. reintroduce 20-30 osprey chicks per year from 2004 through 2007 at selected sites in southeastern South Dakota 2. document timing, distance and routes of migration for juvenile ospreys hacked from selected sites in South Dakota 3. identify wintering areas and arrival and departure dates 4. evaluate characteristics of the migration routes and wintering areas and attempt to identify potential threats to ospreys based on this evaluation 	<p>Melissa Horton, Wildlife Experiences, Janie Fink and Wayne Melquist, University of Idaho</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Peregrine falcon (<i>Falco peregrinus</i>) reintroduction in South Dakota</p> <p>T-10-R-1 Amendment 4 &5 completed 2013</p>	<p>By September 30, 2013:</p> <p>Reintroduce 15 captive-reared falcons in an urban setting in South Dakota to facilitate the return of adult peregrine falcons to establish breeding territories in the vicinity of the reintroduction area.</p>	<p>Janie Fink, Birds of Prey Northwest</p>
<p>A proposal to examine endemism and population relationships of the Black Hills <i>Oreohelix</i> snails</p> <p>T-11-R-1 completed 2006</p>	<ol style="list-style-type: none"> 1. determine if the <i>Oreohelix</i> in the Black Hills consist of one or more than one biological entities that can be defined by genetics, morphology, anatomy, and/or environmental conditions 2. determine if <i>Oreohelix</i> in the Black Hills represent an endemic group, unique from other <i>Oreohelix</i> in the geographical region 	<p>Tamara Anderson, University of Colorado</p>
<p>Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams</p> <p>T-12-R-1 completed 2006</p>	<p>Develop and implement a 3-year Topeka shiner survey program in 11 watersheds necessary to evaluate the management goals outlined in the State Plan and provide baseline data for evaluating long-term trends in Topeka shiner populations and habitat</p>	<p>Steve Wall</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Nesting success, brood survival, and movements of long-billed curlews (<i>Numenius americanus</i>) in grazed landscapes of western South Dakota</p> <p>T-13-R-1</p> <p>completed 2006</p>	<ol style="list-style-type: none"> 1. determine the effects of land-use practices (grazing regimes) on nesting habitat selection, nest density, and nesting success by long-billed curlews 2. determine the effects of land-use practices (grazing regimes) on movement rates and brood survival of long-billed curlews 3. assess the importance of early-seasons food availability from different grazing regimes on the resultant nesting success and population recruitment in long-billed curlews 	<p>K.C. Jensen, SDSU</p>
<p>Natural history and genetic makeup of the northern flying squirrel (<i>Glaucomys sabrinus bangsi</i>) population in the Black Hills and northeastern South Dakota</p> <p>T-14-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. determine reproductive characteristics, morphological characteristics, habitat selection, seasonal activity patterns, population characteristics, distribution and food habits 2. to develop proper handling, trapping, and radio-collaring techniques 3. determine the genetic variability and genetic distance between the Black Hills, South Dakota and northeastern South Dakota populations of northern flying and red squirrel using microsatellite markers, mitochondrial DNA markers, and Y-chromosome markers 4. study the population and develop parentage testing for the <i>Glaucomys sabrinus</i> and <i>Tamiasciurus hudsonicus</i> in the Black Hills, South Dakota and northeastern South Dakota using microsatellite markers 	<p>Chuck Dieter, SDSU and Hugh Britten, USD</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Bat habitat protection and evaluation: implementing and assessing management techniques</p> <p>T-15-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. evaluate the management activities undertaken within the Black Hills region to date 2. determine the role of Black Hills habitat in supporting regional bat populations 3. identify ten additional sites providing significant habitat to regional bat species and develop management plans for their protection 4. establish a database of bat survey data based upon active and hibernation seasons 5. compile a call library of bat echolocation calls for all species identified within South Dakota 	<p>Joel Tigner, BatWorks</p>
<p>Statewide colonial and semi-colonial waterbird inventory with a plan for long-term monitoring</p> <p>T-16-R-1</p> <p>completed 2007</p>	<p>Implement a statewide inventory of colonial and semi-colonial waterbird populations in South Dakota and develop a plan for their long-term monitoring</p>	<p>Nancy Drilling, Rocky Mountain Bird Observatory</p>
<p>Monitoring the American burying beetle in South Dakota</p> <p>T-17A-R-1</p> <p>completed 2009</p>	<ol style="list-style-type: none"> 1. expand monitoring efforts to cover more habitat annually than is currently being surveyed 2. increase sampling time in June and August, when adult ABB are most active 3. tag individuals with numbered bee tags to facilitate tracking movements and estimate population size through recaptures 	<p>Doug Backlund, SDGFP and Gary Marrone</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Monitoring butterfly species of concern in South Dakota</p> <p>T-17B-R-1</p> <p>completed 2009</p>	<ol style="list-style-type: none"> 1. survey suitable habitat throughout the Black Hills and northeastern South Dakota for 4 target species 2. collect information on plant species used as larval food sources and adult nectar sources 3. develop a monitoring plan for 4 target species, if populations are found that warrant monitoring 	<p>Doug Backlund, SDGFP</p>
<p>Monitoring American dippers in the Black Hills</p> <p>T-17C-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. monitor annual production at nest sites for 5 years 2. assess aquatic insect abundance at nest sites 3. monitor winter use of stream habitat by dippers for 5 years 4. track movements and length of survival of color banded dipper for 5 years 	<p>Doug Backlund, SDGFP</p>
<p>Comprehensive aquatics survey of the Minnesota River tributaries</p> <p>T-17D-R-1</p> <p>completed 2007</p>	<p>Provide up-to-date survey information on the relative abundance of fish, unionid mussel, and aquatic insect species to determine populations trends and state heritage ranks</p>	<p>Jeff Shearer and Andy Burgess, SDGFP</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Biology of American three-toed woodpeckers in the Black Hills</p> <p>T-18-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. survey Black Hills white spruce habitat for resident American three-toed woodpeckers 2. characterize Black Hills white spruce habitats and other habitats used by American three-toed woodpeckers 3. locate nests and monitor production 4. band American three-toed woodpeckers in the Black Hills with standard FWS bands and color bands and use radio transmitters to track movements of a subset of banded birds 5. collect information on foraging behavior and attempt to relate this to habitat 6. record presence and nesting of sympatric avian species inhabiting Black Hills white spruce habitats and evaluate competition 7. collect DNA samples from the Black Hills populations of American three-toed woodpeckers and sequence mitochondrial and microsatellite DNA 8. obtain samples from other populations and determine the genetic uniqueness of Black Hills population 	<p>Dave Swanson, USD</p>
<p>Assessing the impacts of tree plantings on grassland birds in South Dakota</p> <p>T-19-R-1</p> <p>completed 2006</p>	<ol style="list-style-type: none"> 1. compare bird density among transects placed at variable distances from tree plantings 2. evaluate bird density in transects at sites with trees to those from grassland sites without trees (i.e. controls) 3. assess changes in bird density at sites before and after trees are removed as part of an experimental manipulation 	<p>Dave Naugle, University of Montana</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Northern cricket frog (<i>Acris crepitans</i>) seasonal status and distribution in southeastern South Dakota</p> <p>T-20A-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. determine cricket frog occurrence and abundance in appropriate habitats within its historic range in South Dakota 2. determine overwintering habitat and habitat conditions in South Dakota 3. determine freezing tolerance capacity for cricket frogs in South Dakota 	<p>Dave Swanson, USD</p>
<p>Status and distribution of turtles and turtle nests, particularly species of greatest conservation need, in southeastern South Dakota</p> <p>T-20B-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. survey waterways in southeastern South Dakota, particularly the Missouri River, to locate and identify turtle nests and locations 2. determine characteristics of the identified areas, including occupied niches 3. compare habitats occupied to habitats available as nest sites to help in making management recommendations 	<p>Chuck Dieter, SDSU</p>
<p>Genetic variation in the smooth green snake, <i>Liochlorophis vernalis</i>, in South Dakota</p> <p>T-21-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. analyze the extent of genetic variation in this species within South Dakota. 2. examine genetic distance amongst South Dakota populations relative to those outside of the state 	<p>Brian Smith, Black Hills State University</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Distribution and monitoring of bat species along the lower Missouri River with emphasis on resident vs. migratory behavior</p> <p>T-22-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. determine migratory behaviors/patterns and migratory timing of bats in South Dakota, specifically those that may use the Missouri River drainage as a corridor 2. determine the distribution, seasonal activity pattern and habitat selection of bats using the Missouri River drainage 	<p>Scott Pedersen, SDSU</p>
<p>Does prairie dog colony size matter? Implications for the conservation of grassland biota in South Dakota</p> <p>T-23-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. compare burrowing owl abundance across a range of prairie dog colony sizes 2. compare prairie dog density and productivity across a range of prairie dog colony sizes 3. compare vegetation cover and composition across a range of prairie dog colony sizes as a measure of forage utility to prairie dogs and other herbivores 4. develop a suite of competing models that compare the influence of covariates (i.e. colony size, age, and spatial arrangement, soil type, and annual precipitation) on burrowing owls, prairie dogs, and vegetation 	<p>Kristy Bly and Mike Phillips, Turner Endangered Species Fund</p>
<p>Development and application of a habitat assessment tool for juvenile pallid sturgeon in the upper Missouri River</p> <p>T-24-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. develop and evaluate a juvenile pallid sturgeon bioenergetics model. 2. quantify effects of water temperature, turbidity and water velocity on feeding rate of juvenile pallid sturgeon. 3. model habitat suitability for juvenile pallid sturgeon in the Missouri River. 4. quantify prey selectivity of age-0 pallid sturgeon 	<p>Steve Chipps, SDSU, Coop. Unit</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Restoring swift foxes (<i>Vulpes velox</i>) to the Bad River Ranches and environs in western South Dakota</p> <p>T-25-R-1</p> <p>completed 2009</p>	<p>Job 1:</p> <ol style="list-style-type: none"> 1. establish a self-sustaining population of swift fox in west-central South Dakota (Haakon, Jackson, Jones, Lyman and Stanley counties) that serves as a course for swift fox recovery and expansion in the northern Great Plains, assists in removing this species from the South Dakota threatened species list, restores native biodiversity to the area, and promotes prairie conservation awareness. 2. collect and disseminate scientific information on the ecology of the species, the ecological requirements for successful restoration, and the evaluation of reintroduction and management techniques. <p>Job 2:</p> <ol style="list-style-type: none"> 1. to evaluate resource selection of swift foxes during the pup-rearing period in the mixedgrass prairie of west-central South Dakota 2. to refine the existing habitat suitability model developed by Kunkel et al. (2003) for the pup-rearing period using updated techniques and area-specific data 	<p>Kevin Honness and Mike Phillips, Turner Endangered Species Fund; amended to Dr. Jon Jenks, SDSU</p>
<p>Wildlife habitat inventory on game production areas in eastern South Dakota</p> <p>T-26-R-1</p> <p>completed 2009</p>	<p>To map, categorize, and make management recommendations for remaining tracts of native grassland and associated native habitats on state Game Production Areas in a 33 county area of eastern South Dakota</p>	<p>Dan Limmer, Sustained Horizons</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Exploration of factors that influence productivity of American white pelicans at Bitter Lake in northeastern South Dakota</p> <p>T-27-R-1</p> <p>completed 2011</p>	<ol style="list-style-type: none"> 1. determine nest-attendance schedules and chick-feeding rates during the pre-crèche stages of breeding 2. estimate distances to foraging sites 3. determine locations and attributes of foraging sites 4. document sources of disturbance at nesting areas; 5. monitor colony productivity 	<p>Marsha Sovada and Pam Pietz, USGS-Northern Prairie Wildlife Research Center</p>
<p>Sage-steppe and prairie conservation planning</p> <p>T-28-R-1</p> <p>ongoing</p>	<p>By 30 June 2010, develop a cohesive, comprehensive, WAFWA prairie conservation strategy that integrates pertinent components of companion efforts for the white-tailed, Gunnison's, and black-tailed prairie dogs; black-footed ferret; swift and kit foxes; lesser prairie chicken; mountain plover; burrowing owl; ferruginous hawk; Swainson's hawk; loggerhead shrike; and, as appropriate and feasible, other shrub and grassland species in the Western Great Plains.</p>	<p>WAFWA</p>
<p>Mapping big sagebrush vegetation in western South Dakota</p> <p>T-29-R-1</p> <p>completed 2008</p>	<p>To map remaining stands of big sagebrush vegetation in three western SD counties: Butte, Harding and Fall River</p>	<p>Mike Pucharelli, USBR and Dan Cogan, Cogan Technology Inc.</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Population estimates, habitat relationships, and movement patterns of turtles, with an emphasis on two species of greatest conservation need, the False Map Turtle, <i>Graptemys pseudogeographica</i> and the Smooth Softshell, <i>Apalone mutica</i>, in southeastern South Dakota</p> <p>T-30-R-1</p> <p>in progress</p>	<ol style="list-style-type: none"> 1. determine age structure, sex ratios, and abundance of turtles 2. investigate effects of harvest in James River 3. utilize radio telemetry to investigate how patterns of movement relate to seasonal, sexual and age related parameters of Smooth Softshells and False Map Turtles on the Missouri River and associated tributaries 4. monitor radio tagged turtles and environmental variables associated with their hibernacula in order to investigate the occurrence of, and factors related to winter mortality 5. document and determine how habitat characteristics of aquatic and riparian areas relate to the utilization and distribution of turtle assemblages within southeastern South Dakota 	<p>David Swanson USD</p>
<p>Testing the ecosystem diversity approach of South Dakota's Wildlife Action Plan</p> <p>T-31-R-1</p> <p>completed 2009</p>	<ol style="list-style-type: none"> 1. develop a prototype process for focussing the scope of the South Dakota Wildlife Action Plan to address discrete local-level planning areas using a selected portion of the Missouri Coteau Planning Area 2. identify and explore additional opportunities to assess South Dakota's ecosystem diversity at a local level 	<p>EMRI</p>
<p>Avian monitoring in the Black Hills</p> <p>T-32-R-1</p> <p>completed 2010</p>	<p>Monitor aspen and shrubland habitats on Black Hills National Forest using techniques developed by Rocky Mountain Bird Observatory</p>	<p>Glenn Giroir, RMBO</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>An evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota</p> <p>T-33-R-1</p> <p>completed 2009</p>	<ol style="list-style-type: none"> 1. describe local vegetational habitat requirements of SoGCN and Level I and Level II priority grassland bird species 2. describe habitat associations for SoGCN and Level I and Level II priority grassland bird species 3. identify patch and landscape level habitat requirements for SoGCN and Level I and Level II priority grassland bird species 	<p>Kristel Bakker, DSU and Charles Dieter, SDSU</p>
<p>Estimating conversion of native grassland to cropland in South Dakota: Loss of habitat for grassland-nesting birds</p> <p>T-34-R-1</p> <p>completed 2007</p>	<ol style="list-style-type: none"> 1. estimate recent rates of conversion of native grassland to cropland in South Dakota 2. use observed recent conversion to validate predictive models of the probability of conversion of grassland to cropland 3. develop predictive models of the cost of protection for native grassland 4. employ probability models to develop a GIS which will enable wildlife managers to assess the conservation priority of grassland habitats and landscapes in South Dakota 	<p>Scott Stephens, DU</p>
<p>Understanding the relationship between prairie dog ecology and black-footed ferret resource selection</p> <p>T-35-R-1</p> <p>completed 2009</p>	<ol style="list-style-type: none"> 1. measure the spatial distribution of prairie dogs at multiple spatial scales through state-of-the-art resource monitoring and GIS techniques 2. measure resource selection by ferrets and relate resource selection to the spatial distribution of prairie dogs 3. measure prey selection by ferrets 	<p>Joshua Millspaugh, University of Missouri-Columbia</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>An aquatic invasive species risk assessment for South Dakota</p> <p>T-36-R-1</p> <p>completed 2008</p>	<ol style="list-style-type: none"> 1. supply information required for effective control and management of aquatic invasive species (AIS) in South Dakota 2. develop an objective ranking of threat from AIS 	<p>Dr. Katie Bertrand, South Dakota State University</p>
<p>Assessment, monitoring and protection of bat habitats in western South Dakota</p> <p>T-37-R-1</p> <p>completed 2010</p>	<ol style="list-style-type: none"> 1. continue to evaluate the management activities undertaken within western South Dakota to date to benefit bat species by surveying protected hibernacula (both abandoned mines and natural caves), surveying active season bat use of protected sites (compared with pre-gating surveys), and annually monitoring protected sites for vandalism 2. identify and install bat-friendly, vandal-resistant gates at up to 20 additional sites that provide significant habitat to regional bat species and develop management plans for their protection 	<p>Joel Tigner, Bat Works</p>
<p>What factors affect territoriality and productivity of black-footed ferrets?</p> <p>T-38-R-1</p> <p>in progress</p>	<ol style="list-style-type: none"> 1. measure space use of black-footed ferrets in small black-tailed prairie dog complexes and relate territory size, colony size, and carrying capacity by December 15, 2010 2. measure space use by female ferrets and compare the degree of overlap with offspring and unrelated ferrets by December 15, 2010 3. measure space use and resource overlap between black-footed ferrets and badgers by December 15, 2010 4. measure and relate ferret productivity, prairie dog productivity, and forage productivity by December 15, 2010 	<p>Shaun Grassel, University of Idaho</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Importance of mountain pine beetle infestations and fire as Black-backed Woodpecker habitat in the Black Hills, South Dakota</p> <p>T-39-R-1</p> <p>completed 2011</p>	<p>Understand the relative importance of fire and MPB infestations on population and habitat selection processes of BBWO:</p> <ol style="list-style-type: none"> 1. estimate home ranges during the breeding season, fall, and winter in recently burned and MPB habitats 2. document seasonal time budgets in recently burned and MPB habitats 3. compute general and forage resource selection models for BBWO 4. develop a demographic population model that compares BBWO demographics in burned and MPB habitats of the Black Hills, SD 5. write an article for the public (e.g., South Dakota Conservation Digest, etc.) about the role of disturbance in maintaining BBWO habitat 	<p>Josh Millsbaugh, UMC and Mark Rumble, Forest Service</p>
<p>Nesting success of tree-nesting waterbirds in colonies on selected wetlands in northeast South Dakota</p> <p>T-40-R-1</p> <p>completed 2010</p>	<p>By June 30, 2010:</p> <ol style="list-style-type: none"> 1. to determine the nesting success of tree-nesting waterbirds breeding in colonies on selected wetlands in northeast South Dakota as suggested in the SDWCCP and SDABCP 2. to identify important aspects of habitat required for colonial tree-nesting waterbirds on wetlands of northeast South Dakota in order to create management recommendations 	<p>Chuck Dieter, SDSU and Kristel Bakker, Dakota State University</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>South Dakota Breeding Bird Atlas 2</p> <p>T-41-R-1</p> <p>in progress</p>	<p>By June 30, 2014:</p> <ol style="list-style-type: none"> 1. document current distribution of all breeding bird species, including under-surveyed species such as owls and secretive marshbirds 2. assess changes in distributions of breeding birds since the first SDBBA (1988-1992) 3. identify habitat associations and requirements for all breeding species 4. produce a report and interactive web site with species distribution maps and analyses 	<p>Nancy Drilling, Rocky Mountain Bird Observatory</p>
<p>Faunal survey of the delta habitat of Upper Lewis and Clark Lake</p> <p>T-42-R-1</p> <p>completed 2012</p>	<p>By June 1, 2012:</p> <ol style="list-style-type: none"> 1. Survey the delta for marsh birds, amphibians, reptiles, and freshwater invertebrates, specifically targeting Wildlife Action Plan species of greatest conservation need. 2. Examine the potential for trematode infection in amphibian, snail, and bird hosts. 3. Disseminate information concerning the delta fauna to both wildlife biologist and the general public. 	<p>Jacob Kerby and David Swanson, USD</p>
<p>Status of the Bear Lodge Meadow Jumping Mouse (<i>Zapus hudsonius campestris</i>)</p> <p>T-43-R-1</p> <p>completed 2012</p>	<p>By December 31, 2012:</p> <ol style="list-style-type: none"> 1. Determine the present distribution, abundance, and habitat affinity of <i>Zapus hudsonius campestris</i> in the Black Hills of South Dakota during June and July of 2010 and 2011. 2. Compare the present distribution and abundance with historical records of this species. 	<p>Tim Mullican, Dakota Wesleyan University</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Distribution, abundance, and seasonal habitat use patterns in ornate box turtles in South Dakota</p> <p>T-44-R-1</p> <p>completed 2012</p>	<p>By May 15, 2012:</p> <ol style="list-style-type: none"> 1. Estimate the geographic range of ornate box turtles in South Dakota through the use of ecological niche modeling. 2. Document the macro- and microhabitat use throughout the active season (May through September). 3. Describe movements and estimate home range size. 4. Document daily and seasonal activity periods. 5. Estimate population size. 6. Provide training in ecological field research to Oglala Lakota College (OLC) students. 	<p>Alessandra Higa and Hugh Quinn, Oglala Lakota College</p>
<p>Survey and mapping of Black Hills montane grasslands</p> <p>T-45-R-1</p> <p>completed 2012</p>	<p>By December 31, 2012:</p> <ol style="list-style-type: none"> 1. Digitally map higher quality Black Hills montane grasslands; construct a montane grassland GIS layer in cooperation with public agencies. 2. Provide a set of photos of survey sites from relocatable points. 3. Thoroughly characterize the Black Hills montane grassland vegetation type. 4. Develop a field key to the type. 5. Share information through national databases and publication in an academic journal. 	<p>Hollis Marriott, Don Faber-Langendoen, and Jim Drake</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Evaluation of artificial bat roost selection and occupancy in South Dakota ecoregions</p> <p>T-46-R-1</p> <p>in progress</p>	<p>By May 15, 2014:</p> <ol style="list-style-type: none"> 1. Determine optimal bat house designs for habitat specific ecoregions in South Dakota. 2. Record and assess occupancy and microclimate of existing artificial roosts for comparison with historical data collected by Joel Tigner and throughout the period of the grant. 3. Develop bat house design recommendation plans for landowners and homeowners; create a pamphlet for the SDSU Extension Service and link to South Dakota Bat Working Group website to make research results available to the public. 4. Evaluate potential for a continued volunteer monitoring program at sites. 5. Assess potential influence of environmental factors on artificial roost selection/occupancy. 6. Perform acoustic surveys at occupied sites for determination of bat species present and DNA fecal analysis to determine species using bat houses. 	<p>Scott Pedersen, SDSU</p>
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South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Mapping and characterization of calcareous fens in eastern South Dakota</p> <p>T-47-R-1</p> <p>in progress</p>	<p>By December 31, 2014:</p> <ol style="list-style-type: none"> 1. Delineate favorable fen habitat and identify potential fen locations in South Dakota. 2. Confirm fen locations and characterize plant community composition, peat depth, water chemistry, and surrounding land use of both previously described and newly delineated calcareous fens. 3. Develop indices of calcareous fen condition and develop statistical models to relate condition to site-level management, size and isolate of fen, and landscape and regional land use factors. 4. Develop an ArcGIS geodatabase. 	<p>Mark Dixon, USD and Gary Larson, SDSU</p>
<p>Revision of South Dakota comprehensive wildlife conservation plan</p> <p>T-48-R-1</p> <p>in progress</p>	<p>By December 31, 2013:</p> <p>Revise the South Dakota Wildlife Action Plan by reviewing and updating the 8 required elements and including consideration of climate change as a potential cause of concern for South Dakota's fish and wildlife species and associated habitats.</p>	<p>Jon Haufler, EMRI, and GFP staff</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Preliminary investigation into migratory movements of bats in South Dakota</p> <p>T49-R-1</p> <p>initial project completed, but additional data analysis needed</p>	<p>By June 30, 2013:</p> <ol style="list-style-type: none"> 1. Describe (graphically) and detect (statistically) significant peaks in annual, monthly, and nightly bat activity (as measured by a bat activity index) at 16 selected bat migration stations located throughout South Dakota. 2. Determine if the 15 selected monitoring stations experience peaks in bat activity during spring and fall migration during each calendar year of the study. 3. Determine if a correlation exists between environmental variables (time, temperature, wind speed, etc.) and a bat activity index at each of the 16 selected bat migration stations during spring and fall or throughout the calendar year. 4. Measure annual and seasonal (spring and fall) bat species (or species group) richness at each of 16 selected bat migration stations. 5. Provide recommendations for a long-term bat migration monitoring program. 	<p>Joel Tigner, BatWorks, and Silka Kempema, SDGFP</p>
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South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Classification and mapping of riparian forest along the White River in South Dakota</p> <p>T-50-R-1</p> <p>in progress</p>	<p>By June 30, 2014:</p> <ol style="list-style-type: none"> 1. Map vegetation extent, structure, and composition along the riparian corridor of the White River in South Dakota within a GIS framework, using a hierarchical classification system compatible with the National Vegetation Classification. 2. Sample and quantify riparian forest composition and structure within selected study reaches along the White River, with a particular emphasis on the delta where the White River flows into the Missouri River (Lake Francis Case). 3. Quantify historic changes in riparian vegetation extent, recruitment, and channel dynamics via analysis of historic aerial photography using GIS, along selected reaches of the White River. 	<p>Mark Dixon, USD and W. Carter Johnson, SDSU</p>
<p>Past and Current Vegetation Conditions of Core Sagebrush Habitat and Leaks of the Greater Sage-Grouse (<i>Centrocercus urophasianus</i>) at the easternmost extent of its range in Western South Dakota</p> <p>T-51-R-1</p> <p>completed 2013</p>	<p>By April 30, 2013:</p> <ol style="list-style-type: none"> 1. Review and analyze data and field check locations of historical data on GRSG occurrences and associated habitat information. 2. Repeat data collection at historical sites described in Carter data, including vegetation data and observations of individual GRSG, GRSG leks and collection of plant voucher specimens, as needed. 3. Compile and summarize existing information on GRSG counts and lek data collected in South Dakota for comparison to the historical Carter data and the results obtained in Objective 2. 4. Compile information on sagebrush habitat restoration methods and evaluate public land sites for potential future restoration work. 	<p>Shelly Deisch, SDGFP and Daryl Mergen, Mergen Ecological Delineations, Inc.</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Colonial and semi-colonial waterbird monitoring</p> <p>T-52-R-1</p> <p>completed 2012</p>	<p>By December 31,2012:</p> <ol style="list-style-type: none"> 1. Survey major and important colonial and semi-colonial waterbird breeding colonies to document and enumerate breeding species. 2. Document current habitat conditions at each major and important colony site and identify the surrounding land use and management practices within ½ mile of the colony centroid. 3. Conduct aerial surveys in the Prairie Coteau, Lake Thompson watershed, and Northern Pothole regions of South Dakota to document breeding status in known colonial and semi-colonial waterbird colonies and search for new colonies. 	<p>Nancy Drilling, RMBO</p>
<p>Status and distribution of Franklin’s ground squirrels and Richardson’s ground squirrels in eastern South Dakota</p> <p>T-53-R-1</p> <p>in progress</p>	<p>By June 30,2015:</p> <ol style="list-style-type: none"> 1. To identify colony sites, determine the current range, and estimate relative abundance of <i>S. franklinii</i> and <i>S. richardsonii</i> in eastern South Dakota, as suggested in the SDCWCP (SDGFP 2006). 2. To describe land use and habitat characteristics of colony sites of <i>S. franklinii</i> and <i>S. richardsonii</i>, and create a georeferenced database of <i>S. richardsonii</i> colony locations as suggested in the SDCWCP (SDGFP 2006). 3. To identify important areas of habitat required for <i>S. franklinii</i> and <i>S. richardsonii</i> in order to create management recommendations. 	<p>Charles Dieter, SDSU and Tim Mullican, DWU</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Mapping and characterization of native grassland habitats on South Dakota's prairie Coteau</p> <p>T-54-R-1, Amendment 2</p> <p>in progress</p>	<p>By May 31, 2015:</p> <ol style="list-style-type: none"> 1. Delineate all remaining grassland habitat within a 225-square mile study area located on a portion of the Prairie Coteau with the highest number of documented records of Dakota skipper butterflies. This grassland inventory will involve the use of aerial imagery and ground truthing to produce a GIS layer of remaining native grassland. 2. Rank the ecological condition of delineated grassland parcels within the study area based upon the "Condition Ranking Guidelines" developed by the Minnesota County Biological Survey, and other vegetation inventory projects. 3. Quantitatively characterize the native vegetation that predominates at sites inhabited by Dakota Skipper butterflies. This will involve quantitative sampling of representative stands of each native grassland vegetation type within the study area. Vegetation plot data will be collected to enable comparison with previously collected plot data from elsewhere on the Prairie Coteau. 4. Identify sites within the study area likely to support Dakota Skipper butterflies based upon vegetation and habitat characteristics. 	<p>Lan Xu and Gary Larson, SDSU</p>
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South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Determination of river otter distribution and evaluation of potential sites for population expansion in South Dakota</p> <p>T-55-R-1</p> <p>in progress</p>	<p>By December 31, 2014:</p> <ol style="list-style-type: none"> 1. Update river otter occupancy status of drainages with evidence more than 5 years old. 2. Determine river otter occupancy status of agreed-upon drainages. 3. Evaluate agreed-upon sites for reintroduction suitability. 	<p>Wayne Melquist, CREX Consulting</p>
<p>Development of a long-term grassland songbird monitoring program for South Dakota with an emphasis on species of greatest conservation need</p> <p>T-56-R-1</p> <p>in progress</p>	<p>By June 30, 2015:</p> <ol style="list-style-type: none"> 1. Update existing literature review with peer-reviewed publications published after 2003 and synthesis with a focus on grassland passerines to be completed by September 2012 2. Conduct literature review, synthesis, and analysis of bird survey and monitoring methodologies by May 2013. 3. Conduct review and analysis of existing grassland bird monitoring programs and consult with monitoring experts by May 2013 (ongoing). 4. Propose, finalize, and test monitoring program methodologies. 5. Develop long-term (10-15 year) monitoring plan containing specific data collection field methodology and estimated cost. 6. Plan methodology will increasing grassland passerine species detection rates, provide statistically valid data and address bird population monitoring criteria outlined by the U.S. NABCI Monitoring Subcommittee. 	<p>Kristel Bakker, DSU and Silka Kempema, SDGFP</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Threats, management, and suggested harvest and collection policy of herpetofauna of South Dakota</p> <p>T-57-R-1</p> <p>completed 2012</p>	<p>By September 1, 2012:</p> <ol style="list-style-type: none"> 1. Provide recommendations on take allowances. 2. Provide data to justify the amount of take, both commercially and via fishing licenses. 3. Identify best management practices which could be implemented for herpetofauna during construction projects. 4. Identify general threats to reptiles and amphibians in South Dakota. 5. Provide a final report with data supported recommendations to South Dakota Game, Fish, and Parks (SDGFP) which could be implemented in management decisions. 	<p>Brian Smith, BHSU and Hugh Quinn, OLC</p>
<p>Breeding ecology of ferruginous hawks and golden eagles in north-central and western South Dakota</p> <p>T-58-R-1</p> <p>in progress</p>	<p>By June 30, 2016:</p> <ol style="list-style-type: none"> 1. Using ground and aerial surveys, document locations of all nesting raptor species of interest in the study area. 2. Evaluate reproductive parameters of ferruginous hawk and golden eagle nests. 3. Evaluate food habits of ferruginous hawks and golden eagles in space and time. 4. Document mammalian prey species abundance using line transects, focusing on prey species documented in the literature as major prey items for ferruginous hawks and golden eagles. 	<p>Troy Grovenburg, SDSU</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Breeding ecology of ferruginous hawks and golden eagles in north-central and western South Dakota (continued)</p> <p>T-58-R-1</p> <p>in progress</p>	<ol style="list-style-type: none"> 5. Identify landscape characteristics associated with raptor nests within each study area by examining habitat characteristics within multiple spatial scales around each nest site, and evaluating how local- and landscape-level processes influence nesting patterns and overall reproductive success. 6. Using nest occupancy data gathered during this study and survey data gathered during previous research in Harding, Perkins, and McPherson counties, determine raptor detection probability and nest occupancy through time, and model how future land-use changes could potentially influence population viability and sustainability. 	
<p>Evaluation of the James River Conservation Reserve Enhancement Program in South Dakota</p> <p>T-59-R-1</p> <p>in progress</p>	<p>By December 31, 2016:</p> <ol style="list-style-type: none"> 1. Assess effects of CREP on water quality, aquatic habitats and fish assemblage structure in the James River, its tributaries, and watershed wetlands. 2. Assess functional and numerical responses of avifauna to the James River Conservation Reserve Enhancement Program. 	<p>Joshua Stafford, SD Coop. Unit and Katie Bertrand, SDSU</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Preliminary investigation of the role of small mammals in the maintenance of plague on Lower Brule black-tailed prairie dog colonies</p> <p>T-60-R-1</p> <p>in progress</p>	<p>By June 30, 2016:</p> <ol style="list-style-type: none"> 1. Estimate the effect of treatment with deltamethrin on the survival, density, and diversity of small rodents on black-tailed prairie dog colonies. 2. Estimate the prevalence of <i>Yersinia pestis</i> in burrow-collected fleas on black-tailed prairie dog colonies pre- and post-treatment with deltamethrin and in fleas from prairie dogs collected in 2010 to obtain an estimate of <i>Y. pestis</i> prevalence in the study colonies. 3. Estimate and detect any differences in <i>Y. pestis</i> prevalence in fleas on small rodents on treated, untreated, inactive colony, and off-colony plots and compare these prevalence estimates to <i>Y. pestis</i> prevalence of fleas collected from prairie dog burrows. 4. Measure the exposure of small rodents to plague on and near black-tailed prairie dog colonies by titers for plague antibodies in blood samples. 5. Detect any change in flea abundance and flea species diversity on small rodents on treated, untreated, inactive colony, and off-colony plots and in black-tailed prairie dog burrows on dusted and undusted plots. 	<p>Hugh Britten, USD</p>
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South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>A population survey of mussels in South Dakota rivers</p> <p>T-61-R-1</p> <p>in progress</p>	<p>By December 31, 2016:</p> <ol style="list-style-type: none"> 1. Assess the presence of mussel populations, distribution, abundance, and habitat affinity from wadeable streams across the state of South Dakota. 2. Conduct effort-based survey of mussel species occurrence followed by quantitative species counts and habitat assessment from wadeable tributary and main stem sites of major river basins to determine species composition and habitat preference. 3. Provide recommendations for an effective long-term monitoring plan for mussels across the state of South Dakota. 	<p>Nels Troelstrup, SDSU, Chelsey Pasbrig and Mike Smith, SDGFP</p>
<p>Evaluation of timber harvest on nongame bird abundance and diversity in Custer State Park, South Dakota</p> <p>T2-1-R-1</p> <p>completed 2013</p>	<p>By May 15, 2013:</p> <ol style="list-style-type: none"> 1. compare nongame bird abundance and diversity before and after timber sale treatments 2. determine the effects of timber harvest on abundance of sensitive or species of greatest conservation need 3. quantify macro- and micro-habitat characteristics used by nongame birds in a ponderosa pine ecosystem 	<p>Chad Lehman, SDGFP and Kent Jensen, SDSU</p>
<p>Conservation status of the mountain sucker (<i>Catostomus platyrhynchus</i>) in South Dakota</p> <p>T2-2-R-1</p> <p>completed 2011</p>	<p>By December 31, 2011:</p> <ol style="list-style-type: none"> 1. document the current distribution and abundance of mountain sucker in South Dakota for comparison with historical data 2. evaluate the potential influence of physical and biological factors on the abundance and distribution of the mountain sucker 3. inform management recommendations related to the conservation of mountain suckers in SD 	<p>Katie Bertrand, South Dakota State University</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Prevalence of an emerging disease in South Dakota amphibian populations</p> <p>T2-3-R-1</p> <p>completed 2011</p>	<p>By June 1, 2011:</p> <ol style="list-style-type: none"> 1. Survey the prevalence of the chytrid fungus in amphibian populations across South Dakota 2. Use an Amphibian Disease Testing Center to provide timely and cost-efficient evaluations of amphibian disease outbreaks for researchers working in the state of South Dakota 3. Disseminate information concerning the chytrid fungus to both wildlife biologists and the general public 	<p>Jake Kerby</p> <p>University of South Dakota</p>
<p>Classification and mapping of riparian vegetation along the Big Sioux River</p> <p>T2-4-R-1</p> <p>completed 2012</p>	<p>By August 31, 2012:</p> <ol style="list-style-type: none"> 1. Map vegetation extent, structure, and composition along the riparian corridor of the Big Sioux River from Watertown to Sioux City within a GIS framework, using a hierarchical classification system compatible with the National Vegetation Classification 2. Sample and quantify dominant overstory and understory plant species composition within at least 5 stands of each classified vegetation type in a format compatible with VegBank 3. Quantify historic changes in riparian vegetation extent, adjacent land cover, and channel dynamics along the Big Sioux River in Brookings, County, SD 	<p>Mark Dixon</p> <p>University of South Dakota</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Burrowing owl distribution in western South Dakota</p> <p>T2-5-R-1</p> <p>completed 2012</p>	<p>By June 30, 2012:</p> <ol style="list-style-type: none"> 1. Determine distribution of burrowing owl occupied black-tailed prairie dog colonies on 50% of known colonies in western South Dakota 2. Construct a database of black-tailed prairie dog colonies containing multiple burrowing owl pairs which includes size, ownership and management of colonies 3. Describe local vegetational habitat factors associated with occurrence and density of burrowing owls in black-tailed prairie dog colonies 4. Describe habitat associations (active/inactive black-tailed prairie dog colonies, poisoning and grazing regimes, ownership of colonies), colony and landscape level factors affecting burrowing owl use of black-tailed prairie dog colonies 5. Compare vegetation, habitat associations, colony- and colony- and landscape-level characteristics of burrowing owl occupied and unoccupied colonies. 6. Determine factors associated with nest site selection by burrowing owls in select colonies. 	<p>Kristel Bakker, Dakota State University and Chuck Dieter, SDSU</p>
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South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Biodiversity inventory of native bees in the Black Hills Ecoregion</p> <p>T2-6-R-1</p> <p>completed 2012</p>	<p>By December 31, 2012:</p> <ol style="list-style-type: none"> 1. Provide a biodiversity inventory of the native bee species of the Black Hills 2. Focus the survey and inventory on exemplary forest, meadow, and shrub-steppe habitats in the Black Hills of Lawrence, Pennington, Custer, and Fall River counties in South Dakota 3. Document host flowers and analyze floral visitation patterns through seasonal changes 4. Use data collected on species occurrence and associated habitat characteristics for initial geospatial evaluations in order to seek patterns associated with historical and contemporary land-use 	<p>Paul Johnson, SDSU</p>
<p>Distribution and lek locations of Greater Prairie-Chickens and Sharp-tailed Grouse outside of their traditional range in South Dakota</p> <p>T2-7-R-1</p> <p>completed 2012</p>	<p>By June 30, 2012:</p> <ol style="list-style-type: none"> 1. To identify and survey areas of eastern South Dakota where populations of Greater Prairie-Chickens and Sharp-tailed Grouse are suspected to reside, and document their distribution and numbers. 2. To characterize the landscape attributes within 3000 m of identified display grounds (leks). 3. To analyze landscape characteristics using Geographic Information System modeling to develop a predictive model to assist natural resource managers in identifying potential prairie-chicken and sharp-tailed grouse habitats. 	<p>Charles Dieter and Kent Jensen, SDSU</p>

South Dakota Wildlife Action Plan

Appendix F (continued). List of State Wildlife Grant-funded projects conducted in South Dakota, as of 2013.

<p>Glacial relict fishes in spring-fed headwater streams of South Dakota's Sandhills region</p> <p>T2-8-R-1</p> <p>completed 2013</p>	<p>To assess the occurrence of Finescale Dace, Northern Pearl Dace, Northern Redbelly Dace, Blacknose Shiner, and Plains Topminnow in the Sandhills of South Dakota and to provide recommendations for an effective long-term monitoring plan for glacial relict fishes in spring-fed headwater streams.</p>	<p>Katie Bertrand, SDSU</p>
<p>Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams (round two)</p> <p>T2-9-R-1</p> <p>completed 2012</p>	<p>Collect standardized biological and physical habitat data from all previously monitored streams by 2012.</p>	<p>Chelsey Pasbrig, SDGFP</p>
<p>Status of salamander species in South Dakota</p> <p>T62-R-1</p>	<p>By April 30, 2016:</p> <p>Investigate the threat of ranavirus to false map turtle (<i>Graptemys pseudogeographica</i>), smooth softshell (<i>Apalone mutica</i>), Cope's gray treefrog (<i>Hyla chrysoscelis</i>), and Blanchard's cricket frog (<i>Acris blanchardi</i>) by sampling tiger salamander populations (<i>Ambystoma tigrinum</i>) for the presence of ranavirus infection.</p>	<p>Jacob Kerby, USD</p>

South Dakota Wildlife Action Plan

Appendix G. Species-level research and survey needs identified during South Dakota Wildlife Action Plan revision to address conservation challenges.

Conservation challenge	Future or ongoing survey needs Future research needs (Initials indicate respondents ^a)	Relevant SGCN	Related completed or ongoing projects
<p>Diseases</p> <ul style="list-style-type: none"> • white-nose syndrome • West Nile Virus • sylvatic plague • ranavirus • chytrid fungus • snake fungal dermatitis 	<p>Survey:</p> <ul style="list-style-type: none"> • Establish monitoring program to detect new occurrences of ranavirus by geographic area or watershed • Monitor West Nile virus incidence and mortality (ND) • Monitor white pelicans and associated colonial waterbirds for disease outbreaks (ND) 	<ul style="list-style-type: none"> • Cope’s Gray Treefrog • Blanchard’s Cricket Frog • Greater Sage-Grouse • American White Pelican • all SGCN terrestrial populations 	<ul style="list-style-type: none"> • Status of salamander species in South Dakota. Jacob Kerby, USD, PI. State Wildlife Grant T-62-R-1.
	<p>Research:</p> <ul style="list-style-type: none"> • Investigate prevalence of ranavirus in South Dakota amphibian species 		
	<ul style="list-style-type: none"> • Investigate prevalence of West Nile virus and its effects on terrestrial populations, particularly birds (AK) 		<ul style="list-style-type: none"> • USGS research, Marsha Sovada and others
	<ul style="list-style-type: none"> • Examine bacterial and viral species present in American pelican feces, determining strains of microorganisms that may be detrimental to populations (AK) 		

South Dakota Wildlife Action Plan

Appendix G (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision to address conservation challenges.

Exotic or introduced species impacts	<p>Survey:</p> <ul style="list-style-type: none"> Determine whether SDGFP AIS efforts should be expanded to additional areas with high levels of SGCN occurrence. 	<ul style="list-style-type: none"> all aquatic and multiple terrestrial SGCN 	<ul style="list-style-type: none"> SDGFP AIS work
Pollution/pesticides <ul style="list-style-type: none"> environmental contaminants lead poisoning 	<p>Survey:</p> <ul style="list-style-type: none"> Establish monitoring program for large white pelican colonies in South Dakota, in association with fish contaminant monitoring in areas near the largest colonies. 	<ul style="list-style-type: none"> American White Pelican 	<ul style="list-style-type: none"> USGS research study on large white pelican colonies in the Northern Great Plains
	<p>Research:</p> <ul style="list-style-type: none"> Secure and analyze white pelican chick mortalities for analysis of contaminant loads. 	<ul style="list-style-type: none"> American White Pelican 	
	<p>Research:</p> <ul style="list-style-type: none"> Analyze contaminant loads in eastern hog-nosed snakes, lined snakes, and greater short-horned lizards (HQ). 	<ul style="list-style-type: none"> Eastern Hog-nosed Snake Lined Snake Greater Short-horned Lizard 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
Wetland quality (includes riparian strips)	<p>Research:</p> <ul style="list-style-type: none"> Analyze contaminant levels in wetlands; assess damage to these areas (particularly grazing) (BS) 	<ul style="list-style-type: none"> all amphibians Red-bellied Snake 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.

South Dakota Wildlife Action Plan

Appendix G (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision to address conservation challenges.

Damage to Black Hills meadows	<p>Research:</p> <ul style="list-style-type: none"> Study effects of grazing on mesic meadows at higher elevations in the Black Hills (>4000 ft.) (BS) 	<ul style="list-style-type: none"> Black Hills Red-bellied Snake 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
Protection of habitats used by Sagebrush Lizards and Greater Short-horned Lizards	<p>Research:</p> <ul style="list-style-type: none"> Characterization of these habitat types via niche modeling (BS) 	<ul style="list-style-type: none"> Sagebrush Lizard Greater Short-horned Lizard associated species using this habitat type 	<ul style="list-style-type: none"> Short-horned lizard survey (<i>Phrynosoma hernandesi</i>) survey in South Dakota 2008 – 2009. Final Report Submitted to the South Dakota Department of Game, Fish and Parks 31 December 2009. Hugh Quinn, Brian Smith, Holly Quinn and Gwen H. Writer. Brian E. Smith, Jodi L. Massie, and Ben G. Blake. Distribution of the sagebrush lizards, <i>Sceloporus graciosus</i>, in the Black Hills of South Dakota. 2006. Unpublished report submitted to the South Dakota Department of Game, Fish and Parks.
Protection of snake hibernacula	<p>Research:</p> <ul style="list-style-type: none"> Characterization of habitat features required for snake hibernacula via GIS modeling; surveys of such habitat (BS) 	<ul style="list-style-type: none"> all snakes 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota. Massie, J.L., B.E. Smith, and H. Quinn. 2013. Redbelly snake (<i>Storeria occipitomaculata</i>) and smooth greensnake (<i>Opheodrys vernalis</i>) activity along roadways near a presumed hibernaculum. Report to South Dakota Department of Game, Fish and Parks, Pierre, South Dakota.

South Dakota Wildlife Action Plan

Appendix G (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision to address conservation challenges.

Over-collection of reptiles and amphibians	<p>Policy:</p> <ul style="list-style-type: none"> Enact bag limits for the collection of all amphibians and reptile species in South Dakota (HQ). 	<ul style="list-style-type: none"> all amphibians and reptiles 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
Genetic Structure Data	<p>Research:</p> <ul style="list-style-type: none"> Inbreeding rates and nesting success of American white pelicans, determining factors that may contribute to poor survival (AK). Examine subspecies determinations for herpetofauna (AK). 	<ul style="list-style-type: none"> American White Pelican all herpetofauna 	
Riparian area habitat degradation and loss	<p>Survey:</p> <ul style="list-style-type: none"> Establish a monitoring program for mussels and other aquatic biodiversity in South Dakota, in association with housing development along riparian areas. (KPaquatics). 	<ul style="list-style-type: none"> all mussels all aquatic SGCN 	
	<p>Research:</p> <ul style="list-style-type: none"> Study effects of housing developments along riparian areas on mussels and other aquatic biodiversity. (KPaquatics). 		

^aRespondents to South Dakota Wildlife Action Plan research and survey needs assessment request.

Respondent	Code	Affiliation	Topics
Katie Bertrand	(KBaquatic)	South Dakota State University	fish
Kerry Burns	(KeB)	Black Hills National Forest	birds and bats, Black Hills

South Dakota Wildlife Action Plan

Appendix G (continued). Research and survey needs identified during the South Dakota Wildlife Action Plan revision to address conservation challenges.

Respondent	Code	Affiliation	Topics
Charles Dieter	(CD)	South Dakota State University	birds, mammals
Nancy Drilling	(ND)	Rocky Mountain Bird Observatory	birds, habitats
Randy Griebel	(RG)	Nebraska National Forest	black-footed ferrets and related issues
Mick Hanan	(MH)	US Fish and Wildlife Service, Lake Andes NWR	birds, habitats
Steve Hummel	(SHAquatic)	Odonata Central	aquatic insects-Odonata
Alyssa Kiesow	(AK)	Northern State University	herptiles, mammals
Dave Lucchesi	(DLaquatic)	SDGFP	fish
Keith Perkins	(KPaquatic)	University of Sioux Falls	mussels
Hugh Quinn	(HQ)	Oglala Lakota College/Black Hills State University	reptiles, amphibians
Mark Rumble	(MR)	USFS, Rocky Mountain Forest and Range Experiment Station	birds, habitats
Will Saylor	(WSaquatic)	SDGFP	fish
Brian Smith	(BS)	Black Hills State University	reptiles, amphibians
Steve Spomer	(SS)	University of Nebraska-Lincoln	terrestrial insects
Sam Stukel	(SSaquatic)	SDGFP	fish (i.e. Pallid Sturgeon, Blue Sucker, Sturgeon Chub, Sicklefin Chub)
David Swanson	(DS)	University of South Dakota	birds, amphibians
Joel Tigner	(JT)	BatWorks Consulting	bats

South Dakota Wildlife Action Plan

Appendix H. Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision by habitat types or geographical areas.

Habitat or area	Future research needs or ongoing survey needs (Initials indicate respondents ^a)	Relevant SGCN	Related completed or ongoing projects
Wetlands	Research: <ul style="list-style-type: none"> • How are wetland migrants distributed among natural and man-made wetlands? (Source: SD All Bird Conservation Plan) 	<ul style="list-style-type: none"> • Blanchard's Cricket Frog • Willet • Wilson's Phalarope • Black Tern • aquatic insects • Whooping Crane • Piping Plover 	<ul style="list-style-type: none"> • Bakker, K.K. 2005. South Dakota All Bird Conservation Plan. South Dakota Department of Game, Fish and Parks, Wildlife Division Report 2005-09.
	Survey: <ul style="list-style-type: none"> • Tile drainage locations 	<ul style="list-style-type: none"> • Whooping Crane • Willet • Long-billed Curlew • Marbled Godwit • Wilson's Phalarope • Black Tern • LeConte's Sparrow • all aquatic SGCN 	
	Research <ul style="list-style-type: none"> • Impact of narrowleaf cattail and hybrid spp. on wetland birds 	<ul style="list-style-type: none"> • Black Tern • Trumpeter Swan 	
	Research: <ul style="list-style-type: none"> • ID quality stopover habitat for wetland birds 	<ul style="list-style-type: none"> • Piping Plover • Willet • Marbled Godwit • Wilson's Phalarope 	

South Dakota Wildlife Action Plan

Appendix H (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision by habitat types or geographical areas.

Grassland	<p>Survey:</p> <ul style="list-style-type: none"> Overlap converted grassland habitat with the habitat needs of monitored species (CD) 	<ul style="list-style-type: none"> Baird’s Sparrow Swift Fox Western Box Turtle Dakota Skipper Sprague’s Pipit Lark Bunting Baird’s Sparrow Le Conte’s Sparrow Chestnut-collared Longspur 	<ul style="list-style-type: none"> Higgins, K.F., V. J. Smith, J.A. Jenks, J. J. Higgins, and G. A. Wolbrink. 2000. A provisional inventory of relict tallgrass prairie tracts remaining in Eastern South Dakota. SD Agricultural Experiment Station Extension Circular EC912. South Dakota State University, Brookings Ryba, A. 2013. Catalog of map and spatial data products available from the Habitat and Population Evaluation Team (HAPET) Office to support conservation planning and management in the Northern Great Plains Joint Venture. HAPET, Bismarck, ND.
	<p>Research:</p> <ul style="list-style-type: none"> Habitat requirements for non-passerine grassland birds 	<ul style="list-style-type: none"> Burrowing Owl Marbled Godwit Long-billed Curlew Greater Prairie Chicken Ferruginous Hawk 	<p>Relevant species conservation plans (ND)</p> <ul style="list-style-type: none"> http://www.whsrn.org/sites/default/files/file/Marbled_Godwit_Conservation_Plan_10_02-28_v1.2.pdf http://www.whsrn.org/sites/default/files/file/Long-billed_Curlew_Plan_-_USFWS_rev_2009_Sept.pdf
	<p>Research:</p> <ul style="list-style-type: none"> Evaluate impacts of CRP loss on wildlife (ND) 	<ul style="list-style-type: none"> Ferruginous Hawk Marbled Godwit Long-billed Curlew Greater Prairie-Chicken Willet Baird’s Sparrow Lark Bunting Chestnut-collared Longspur Sprague’s Pipit Dakota skipper 	<ul style="list-style-type: none"> SD State Wildlife Grant project T-59-R-1 (Evaluation of the James River Conservation Reserve Enhancement Program in South Dakota); duration 1 January 2013 – 31 December 2016

South Dakota Wildlife Action Plan

Appendix H (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision by habitat types or geographical areas.

Grasslands (continued)	<p>Research:</p> <ul style="list-style-type: none"> Nest success between native and “tame” grasslands (ND) 	<ul style="list-style-type: none"> Marbled Godwit Long-billed Curlew Greater Prairie-Chicken Willet Baird’s Sparrow Lark Bunting Chestnut-collared Longspur Sprague’s Pipit 	
Aquatic	<p>Survey:</p> <ul style="list-style-type: none"> Aquatic vegetation layer (produces invertebrates as a food source) 	<ul style="list-style-type: none"> fish SGCN mussel SGCN Wilson’s Phalarope 	
	<p>Research:</p> <ul style="list-style-type: none"> Bioassessment toolkit 	<ul style="list-style-type: none"> fish SGCN aquatic insects 	<ul style="list-style-type: none"> Krause, J.R., K.N. Bertrand, A. Kafle, and N.H. Troelstrup, Jr. In press. A fish index of biotic integrity for South Dakota’s Northern Glaciated Plains Ecoregion. Ecological Indicators.
Multiple	<p>Research:</p> <ul style="list-style-type: none"> Conduct an assessment of grassland and wetland loss in correlation to wetland, wildlife, and overall ecosystem health (including effects that will be detrimental to humans, potentially including water clarity, invertebrate species composition and quantity, vegetation structure, percent full and average depth for existing wetlands) (MH) 	<ul style="list-style-type: none"> Long-billed Curlew Swift Fox Short-horned Lizard Greater Prairie-Chicken Willet Sprague’s Pipit (ND) all SGCN 	

South Dakota Wildlife Action Plan

Appendix H (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision by habitat types or geographical areas.

Woodlands	<p>Research:</p> <ul style="list-style-type: none"> • Nest success between natural and man-made woodlands • Monitor nesting success and factors effecting nest success of woodland birds using relevant current protocols (DS) • Establish standard methods to evaluate woodland habitat quality and compare natural and planted woodlands 		<ul style="list-style-type: none"> • Followup research needed to evaluate cowbird parasitism in green ash woodlands along the Missouri River. (MR) • Gentry, D.J., D.L. Swanson, and J.D. Carlisle. 2006. Species richness and nesting success of migrant forest birds in natural river corridors and anthropogenic woodlands in southeastern South Dakota. <i>Condor</i> 108:140-153. (DS) • Dan Uresk, U.S. Forest Service, has already completed woodland classifications for cottonwood, green ash, oak, and box elder woodland types (MR). • Liu, M. and D.L. Swanson. 2014. Physiological evidence that anthropogenic woodlots can substitute for native riparian woodlands as stopover habitat for migrant birds. <i>Physiological and Biochemical Zoology</i> 87: <i>In press</i> (DS) • Thomas, N.E. and D.L. Swanson. 2013. Plasma metabolites and creatine kinase levels of shorebirds during fall migration in the Prairie Pothole Region. <i>Auk</i> 130:<i>In press</i>. http://www.jstor.org/stable/10.1525/auk.2013.12169 (DS)
Black Hills	<p>Research:</p> <ul style="list-style-type: none"> • Effects of development on Black Hills wildlife • Wildlife response to mountain pine bark beetle epidemic (ND and MR) • Relationship between summer prescribed fire and timing of wildfires as they relate to Black-backed Woodpecker habitat (MR) • Genetics research on American Three-toed Woodpecker (MR) 	<ul style="list-style-type: none"> • American Dipper • Northern Goshawk • Black Hills Red Squirrel • Northern flying Squirrel • Mountain Sucker • Townsend's Big-eared Bat • Ruffed Grouse • Black-backed, American Three-toed and Lewis's woodpeckers 	

South Dakota Wildlife Action Plan

Appendix H (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision by habitat types or geographical areas.

^aRespondents to South Dakota Wildlife Action Plan research and survey needs assessment request.

Respondent	Code	Affiliation	Topics
Katie Bertrand	(KBaquatic)	South Dakota State University	fish
Kerry Burns	(KeB)	Black Hills National Forest	birds and bats, Black Hills
Charles Dieter	(CD)	South Dakota State University	birds, mammals
Nancy Drilling	(ND)	Rocky Mountain Bird Observatory	birds, habitats
Randy Griebel	(RG)	Nebraska National Forest	black-footed ferrets and related issues
Mick Hanan	(MH)	US Fish and Wildlife Service, Lake Andes NWR	birds, habitats
Steve Hummel	(SHaquatic)	Odonata Central	aquatic insects-Odonata
Alyssa Kiesow	(AK)	Northern State University	herptiles, mammals
Dave Lucchesi	(DLaquatic)	SDGFP	fish
Keith Perkins	(KPaquatic)	University of Sioux Falls	mussels
Hugh Quinn	(HQ)	Oglala Lakota College/Black Hills State University	reptiles, amphibians
Mark Rumble	(MR)	USFS, Rocky Mountain Forest and Range Experiment Station	birds, habitats
Will Saylor	(WSaquatic)	SDGFP	fish
Brian Smith	(BS)	Black Hills State University	reptiles, amphibians
Steve Spomer	(SS)	University of Nebraska-Lincoln	terrestrial insects
Sam Stukel	(SSaquatic)	SDGFP	fish (i.e. Pallid Sturgeon, Blue Sucker, Sturgeon Chub, Sicklefin Chub)
David Swanson	(DS)	University of South Dakota	birds, amphibians
Joel Tigner	(JT)	BatWorks Consulting	bats

South Dakota Wildlife Action Plan

Appendix I. Species-level research and survey needs identified during South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Species or species group	Future or ongoing survey needs Future research needs Educational needs (Initials indicate respondents ^a)	Relevant SGCN	Related completed or ongoing projects
BIRDS			
Raptors	<p>Survey:</p> <ul style="list-style-type: none"> • Continue to monitor nest site selection, nesting phenology, nest success, and population trends of all raptor species. • Survey small mammal populations in key habitats to assess changes in prey base. • Collate data on human-caused mortality (direct hunting, power lines, wind turbines, etc.) (ND) 	<ul style="list-style-type: none"> • Bald Eagle • Osprey • Burrowing Owl • Ferruginous Hawk • Northern Goshawk • Peregrine Falcon 	<ul style="list-style-type: none"> • South Dakota Breeding Bird Atlas 1 and 2 • Bald Eagle Midwinter Survey • Bald Eagle Nest Surveys • Ft. Pierre National Grasslands winter raptor surveys • Raptor Management Surveys • A raptor survey of the Grand River National Grassland, Perkins County, SD • Aerial survey of Northwestern South Dakota for nesting golden eagles

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

<p>Raptors (continued)</p>	<p>Research:</p> <ul style="list-style-type: none"> • Identify critical habitats and prey preferences. • Research the effects of lead and other contaminants in the ecosystem to raptor populations. • Evaluate the potential effects of oil and gas development in northwest South Dakota to raptor nest success. • Assess the impact of wind energy facilities to resident and migratory raptors. • Evaluate the effects of habitat loss due to land conversion and fragmentation to raptor ecology 		<ul style="list-style-type: none"> • Burrowing owl distribution and nest site selection in western South Dakota • Breeding ecology of ferruginous hawks and golden eagles in north central and western South Dakota • Nesting ecology of the northern goshawk in the Black Hills of South Dakota
	<p>Survey:</p> <ul style="list-style-type: none"> • Continue to solicit sightings of color-banded birds to evaluate success of reintroduction efforts 	<ul style="list-style-type: none"> • Osprey • Peregrine Falcon 	
	<p>Survey:</p> <ul style="list-style-type: none"> • Continue periodic monitoring of Black Hills population, including evaluation of nests that may pose risks to powerlines or other structures 	<ul style="list-style-type: none"> • Osprey 	
	<p>Survey:</p> <ul style="list-style-type: none"> • Investigate reports of nesting pairs or color-banded birds 	<ul style="list-style-type: none"> • Peregrine Falcon 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Raptors (continued)	<p>Species Reintroduction:</p> <ul style="list-style-type: none"> Continue the reintroduction of selected species into suitable sites across South Dakota 		<ul style="list-style-type: none"> Reintroduction of osprey into suitable sites along the Missouri River in South Dakota Peregrine falcon reintroduction in South Dakota
Colonial Waterbirds	<p>Survey:</p> <ul style="list-style-type: none"> Continue statewide long-term monitoring of populations, identification of key colonies, and searches for new colony locations. Determine what and how management actions may positively or negatively impact breeding waterbirds. Track size and locations of colonies to aid management of waterbird-fisheries conflicts. Monitor colonies with double-crested cormorants to evaluate how they impact other species in the colonies (CD) Document all bird species using Bitter Lake complex (CD) 	<ul style="list-style-type: none"> American White Pelican Black Tern Interior Least Tern Piping Plover 	<ul style="list-style-type: none"> South Dakota statewide colonial and semi-colonial Waterbird inventory with a plan for long-term monitoring, 2007. South Dakota 2012 colonial waterbird survey South Dakota Breeding Bird Atlas 1 and 2 Colonial waterbird volunteer counts, 2009 and 2010

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

<p>Colonial Waterbirds (continued)</p>	<p>Research:</p> <ul style="list-style-type: none"> • Evaluate breeding habitat requirements and the effects of surrounding land use, changes in water levels, and human disturbances. • Identify causes of colony turnover. • Evaluate potential effects of commercial and non-commercial bait collection to food source availability. • Research factors that contribute to and the effects of interspecific competition at colonies. 		<ul style="list-style-type: none"> • Nesting success of tree-nesting waterbirds in colonies on selected wetlands in northeast South Dakota • Exploration of factors that influence productivity of American white pelicans at Bitter Lake in northeastern South Dakota
<p>American Dipper</p>	<p>Survey:</p> <ul style="list-style-type: none"> • Continue monitoring nest site occupancy in Black Hills (KeB) • Identify critical wintering areas (ND) • Continue to document sightings of color-marked birds <p>Research:</p> <ul style="list-style-type: none"> • Factors limiting population size, distribution (ND) • Winter ecology (ND) • Monitor breeding population/success (ND) 	<ul style="list-style-type: none"> • American Dipper 	<ul style="list-style-type: none"> • Forest Service also interested in monitoring. Possible sharing of personnel, etc.

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Ruffed Grouse	<p>Survey</p> <ul style="list-style-type: none"> Monitor long-term population trends. Possible cost share with FS (KeB) <p>Research:</p> <ul style="list-style-type: none"> Refine monitoring protocol to be more cost effective (KeB) Reasons for dramatic decrease in distribution (ND) 	<ul style="list-style-type: none"> Ruffed Grouse 	<ul style="list-style-type: none"> Hansen, Christopher P.; Rumble, Mark A.; Millspaugh, Joshua J. 2010. Monitoring ruffed grouse in the Black Hills: Protocol and user's manual for the occupancy spreadsheet program. Gen. Tech. Rep. RMRS-GTR-246WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 36 p. Integrated Monitoring in Bird Conservation Regions (IMBCR). Hansen, C.P., J.J. Millspaugh, M.A. Rumble. 2011. Occupancy modeling of ruffed grouse in the Black Hills National Forest. J. Wildl. Manage. 75(1): 71-77. Hansen, C.P., M.A. Rumble, J.J. Millspaugh. Ruffed grouse selection of drumming sites in the Black Hills National Forest. Am. Midl. Nat. 165:400-411.
Greater Prairie-Chicken	<p>Research: (Source: SD Prairie Grouse Management Plan)</p> <ul style="list-style-type: none"> Relate weather variables to grouse production on Ft. Pierre National Grasslands 	<ul style="list-style-type: none"> Greater Prairie-Chicken 	<ul style="list-style-type: none"> South Dakota Department of Game, Fish and Parks. no date. Prairie Grouse Management Plan for South Dakota 2011-2015. South Dakota Department of Game, Fish and Parks, Pierre, SD.
Greater Sage-Grouse	<p>Survey:</p> <ul style="list-style-type: none"> Continued surveys of sagebrush habitat (ND) <p>Research:</p> <ul style="list-style-type: none"> Determine effects of livestock grazing (ND) 	<ul style="list-style-type: none"> Greater Sage-Grouse 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Woodpeckers	<p>Survey:</p> <ul style="list-style-type: none"> • Monitor long-term population trends. Possible cost share with FS. (KeB) • Develop appropriate survey and monitoring techniques (ND) • Conduct baseline survey to determine distribution, estimate population sizes (ND) • Develop plan for long-term monitoring (ND) <p>Research:</p> <ul style="list-style-type: none"> • Evaluate effectiveness of IMBCR for monitoring trends (KeB) • Evaluate woodpecker responses to tree mortality caused by mountain pine bark beetles and fire (ND) • Identify limiting factors to population growth (ND) • Elucidate wood-boring insect prey population cycles in burns (ND) 	<ul style="list-style-type: none"> • Black-backed Woodpecker • Lewis’s Woodpecker • American Three-toed Woodpecker 	<ul style="list-style-type: none"> • Integrated Monitoring in Bird Conservation Regions (IMBCR) • Alternate protocol may be needed for low density birds with irregular distribution such as black-backed woodpecker
Piping Plover and Interior Least Tern	<p>Research</p> <ul style="list-style-type: none"> • Assess health of sandbar habitats with observed success of piping plover and least terns to determine successful habitat characteristics (MH) • Continue evaluation of nesting requirements and responses to annual available habitat 	<ul style="list-style-type: none"> • Piping Plover • Interior Least Tern 	<ul style="list-style-type: none"> • Variety of habitat evaluations conducted by U.S. Army Corps of Engineers, U.S.G.S. and additional research entities
Piping Plover	<p>Survey:</p> <ul style="list-style-type: none"> • Participate in International Piping Plover Census 	<ul style="list-style-type: none"> • Piping Plover 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Trumpeter Swan	<p>Survey:</p> <ul style="list-style-type: none"> • Winter distribution and limits to that distribution (ND) <p>Research:</p> <ul style="list-style-type: none"> • Investigate why breeding population is not spreading (ND) 	<ul style="list-style-type: none"> • Trumpeter Swan 	
Northern Goshawk	<p>Research:</p> <ul style="list-style-type: none"> • Telemetry study – where do pairs go when lose nest tree/stand/ nest- and territory site fidelity (ND) • Prey preferences; prey responses to habitat change and NOGO responses to prey base changes (ND) 	<ul style="list-style-type: none"> • Northern Goshawk 	
Ferruginous Hawk	<p>Research:</p> <ul style="list-style-type: none"> • Effects of prairie dog shooting, poisoning (ND) 	<ul style="list-style-type: none"> • Ferruginous Hawk 	
Whooping Crane	<p>Survey:</p> <ul style="list-style-type: none"> • Continue monitoring movements and associated habitat use of migrating whooping cranes. <p>Research:</p> <ul style="list-style-type: none"> • Habitat requirements at stopover sites (ND) 	<ul style="list-style-type: none"> • Whooping Crane 	
Long-billed Curlew	<p>Survey:</p> <ul style="list-style-type: none"> • Breeding distribution in SD (ND) • Location of core areas for conservation efforts (ND) 	<ul style="list-style-type: none"> • Long-billed Curlew 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Sprague's Pipit	<p>Research:</p> <ul style="list-style-type: none"> • Reproductive success in native versus nonnative grasslands (ND) • Habitat requirements during migration (ND) 	<ul style="list-style-type: none"> • Sprague's Pipit 	
Chestnut-collared Longspur	<p>Research:</p> <ul style="list-style-type: none"> • Identify core areas with highest population densities (ND) • Long-term monitoring of all grassland bird species (ND) 	<ul style="list-style-type: none"> • Chestnut-collared Longspur • all grassland bird species 	
White-winged Junco	<p>Survey:</p> <ul style="list-style-type: none"> • Monitor general status through existing methods, such as SDBBA2, North American Breeding Bird Survey and SDOU reporting 	<ul style="list-style-type: none"> • White-winged Junco 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

MAMMALS			
Bats	<p>Survey:</p> <ul style="list-style-type: none"> • Monitor progression of WNS (KeB) • Monitor important hibernacula sites for evidence of WNS (outside cave entrances for excessive winter/spring bat mortality) (KeB) • Evaluate cave conditions to determine if conditions are conducive to WNS (KeB) • Riparian area surveys, intensive monitoring programs along riparian areas (AK) <p>Agency Coordination:</p> <ul style="list-style-type: none"> • Agencies involved with public land and wildlife management should develop formal relationships to maintain monitoring and continue habitat research. (JT) • Continue requiring compliance with South Dakota bat collection and sampling protocol for scientific collector's permit holders. (JT) • Protect specific locational information on significant roosting locations to prevent unnecessary disturbance. (JT) 	<ul style="list-style-type: none"> • Northern Myotis • Townsend's Big-eared Bat • Silver-haired Bat • Red Bat 	<ul style="list-style-type: none"> • Nationwide monitoring of WNS (USFWS) • Forest Service effort to monitor bats, hibernacula and WNS as funding and time permits. • Forest Service temperature/humidity data loggers in several caves in Black Hills. • South Dakota Bat Working Group. 2004. South Dakota Bat Management Plan. Wildlife Division Report 2004-08. 89 pp. • Bales, B.T. 2007. Regional distribution and monitoring of bats, especially species of conservation concern, along the lower Missouri River in South Dakota. M.S. Thesis, South Dakota State University, Brookings. • Swier, V.J. 2003. Distribution, roost site selection and food habits of bats in eastern South Dakota. M.S. Thesis, South Dakota State University, Brookings. • Tigner, J. and E.D. Stukel. 2003. Bats of the Black Hills – A description of status and conservation needs. South Dakota Department of Game, Fish and Parks. Wildlife Division Report 2003-05. • Tigner (BatWorks) contract work for SDGFP, USFWS and BLM.

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Bats	<p>Survey: (source: South Dakota Bat Working Group. 2004. South Dakota Bat Management Plan. Wildlife Division Report 2004-08. 89 pp.)</p> <ul style="list-style-type: none">• Monitor significant hibernacula and maternity roosts through surveys, especially gated mines and caves.• Evaluate mines (marked for closure on public lands or funded for closure by public monies) through biological survey and monitoring by bat biologists before closure to determine significance of bat habitat.• Design a program for monitoring bats in South Dakota, particularly caves and mines.• Identify hibernacula and maternity roosts of bats, particularly for Townsend’s big-eared bats, and identify sites for gate installations.• Census bats along non-urban riparian corridors to understand the value of these habitats for foraging and roosting and as migration routes.• Survey bridges and box culverts along non-urban riparian corridors to determine location and type (e.g., swallow nests or crevices) of bat roosts.• Identify and protect important maternity roosts, nursery roosts, and hibernacula. (JT) <p>Research:</p> <ul style="list-style-type: none">• Role of abandoned mines in supporting bat populations. (JT)• Conduct future research under framework similar to <i>Guidelines for the Protection of Bat Roosts</i>, American Society of Mammalogists, 1992. (JT) <p>Research: (source: South Dakota Bat Working Group. 2004. South Dakota Bat Management Plan. Wildlife Division Report 2004-08. 89 pp.)</p> <ul style="list-style-type: none">• Determine which bridge and box culvert designs are used most frequently and/or may enhance use by bats in South Dakota• Determine the relative population trend of each bat species in South Dakota.• Continue to gather information on bat reproductive rates, home range, and movement patterns, particularly rare species, in each region of the state.• Determine the effective size of buffer zones needed around occupied caves and/or mines that serve as hibernacula and maternity roosts.• Investigate and determine impact of plant diversity and structure on bat activity at bat foraging habitats.• Determine the diets of each bat species and the relationship between invasive plant species, insect availability, and bat foraging success.• Determine the abundance and diversity of prey and investigate the impacts of pesticides on prey abundance and diversity and the effects on bats.• Analyze the potential threats to bats in areas selected as high priority for wind power generation.• Determine the effects of wind power generation sites on migratory bat populations in South Dakota.• Investigate responses of bats to fire (prescribed or wild) or other disturbance and/or catastrophe.• Continue to gather information on population genetic structure and evolutionary affinities of bat species and/or subspecies throughout the state.• Examine the role bats play in contributing to the control of pest populations in South Dakota.• Determine the effects of selective timber harvest on bat populations in the Black Hills.
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South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Bats (continued)	<p>Education: (South Dakota Bat Working Group. 2004. South Dakota Bat Management Plan. Wildlife Division Report 2004-08. 89 pp.)</p> <ul style="list-style-type: none"> • Develop Black Hills-wide education process (e.g., newspapers, schools, and radio/TV PSA) for existing and new landowners that may have mine audits. • Share information and management recommendations and procedures on how to maintain and enhance forest stands and riparian areas for tree bat roosts. • Increase public awareness of bat use of bridges and box culverts. • Inform pest control groups about bat friendly exclusion procedures and bat biology. • Provide information regarding regulations and policies associated with bats, bat roosts and habitats to agencies, organizations, and individuals. • Provide information regarding bats and their value, protection status, and (if available) conservation incentives. • Identify and develop informational tools to distribute to different publics. 		
Ground Squirrels	<p>Survey:</p> <ul style="list-style-type: none"> • Monitor distribution and abundance to evaluate effects of native grassland alteration. <p>Research:</p> <ul style="list-style-type: none"> • Assess habitat use and requirements • Research factors influencing distributional changes in South Dakota 	<ul style="list-style-type: none"> • Franklin’s Ground Squirrel • Richardson’s Ground Squirrel 	<ul style="list-style-type: none"> • Status and distribution of Franklin’s and Richardson’s ground squirrels in eastern South Dakota-T-53-R-1

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

<p>Black-footed Ferret</p>	<ul style="list-style-type: none"> • Determine the influence of predators and prey on black-footed ferret populations • Evaluate and improve reintroduction methods including captive rearing, captive animal release and translocation of wild animals • Further understand the ecology of sylvatic plague • Evaluate and improve current sylvatic plague mitigation methods including vaccination and insecticide application • Evaluate efficacy of sylvatic plague vaccine as a disease management tool and its effect on black-tailed prairie dog ecosystems 	<ul style="list-style-type: none"> • Black-footed ferret 	<ul style="list-style-type: none"> • Research needs identified by the Conservation Subcommittee of the National Black-footed Ferret Recovery Implementation Team, letter to the Executive Committee, 20 February 2013.
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South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

<p>Arboreal squirrels</p>	<p>Survey:</p> <ul style="list-style-type: none"> • Monitor long-term population trends. (KeB) • Conduct surveys and monitor population trends and dynamics (e.g., reproductive success). Do so in intervals (e.g., every other year) rather than annually to gather long-term data (AK) <p>Research:</p> <ul style="list-style-type: none"> • Evaluate effects of timber harvest and mountain pine beetle to population dynamics and movements • Habitat relationships, habitat use, desired habitat characteristics (KeB) 	<ul style="list-style-type: none"> • Northern Flying Squirrel • Red Squirrel 	<ul style="list-style-type: none"> • Hough, M.J. and C.D. Dieter. 2009. Summer nest tree use by northern flying squirrels in the Black Hills, South Dakota. <i>Am. Midl. Nat.</i> 162:98-111. • Hough, M.J. and C.D. Dieter. 2009. Home range and habitat use of northern flying squirrels in the Black Hills, South Dakota. <i>Am. Midl. Nat.</i> 162:112-124. • Kiesow, A.M., L.E. Wallace, and H.B. Britten. 2011. Characterization and isolation of five microsatellite loci in northern flying squirrels, <i>Glaucomys sabrinus</i> (Sciuridae, Rodentia). <i>Western North American Naturalist</i> 71: 553-556. • Kiesow, A.M., E.M. Monroe, and H.B. Britten. 2012. Genetic structure of the arboreal squirrels <i>Glaucomys sabrinus</i> and <i>Tamiasciurus hudsonicus</i> in the North American Black Hills. <i>Canadian Journal of Zoology</i> 90(9): 1191-1200. • Hough, M. and C. Dieter. 2013. Relative abundance of northern flying squirrels and red squirrels in different forest types, Black Hills, South Dakota. <i>Great Plains Research</i> 23:25-31.
<p>River Otter</p>	<p>Survey: (source: SD River Otter Management Plan)</p> <ul style="list-style-type: none"> • Update knowledge of river otter distribution in South Dakota <p>Research (source: SD River Otter Management Plan)</p> <ul style="list-style-type: none"> • Determine survival, mortality and reproductive rates <p>Education (source: SD River Otter Management Plan)</p> <ul style="list-style-type: none"> • Provide information to the public about river otter population and legal status 	<ul style="list-style-type: none"> • South Dakota Department of Game, Fish and Parks. 2012. South Dakota River Otter Management Plan. South Dakota Department of Game, Fish and Parks Wildlife Division Report Number 2012-07, Pierre, South Dakota, USA. 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

REPTILES AND AMPHIBIANS			
Amphibians and reptiles	Education:	<ul style="list-style-type: none"> all amphibians and reptiles 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota. Kiesow, Alyssa M. 2006. Field guide to amphibians and reptiles of South Dakota. South Dakota Department of Game, Fish and Parks. Pierre, South Dakota.
	Research:	<ul style="list-style-type: none"> Sagebrush Lizard Short-horned Lizard Black Hills Redbelly Snake 	<ul style="list-style-type: none"> Massie, J.L., B.E. Smith, and H. Quinn. 2013. Redbelly snake (<i>Storeria occipitomaculata</i>) and smooth greensnake (<i>Opheodrys vernalis</i>) activity along roadways near a presumed hibernaculum. Report to South Dakota Department of Game, Fish, and Parks, Pierre, South Dakota. Brian E. Smith, Jodi L. Massie, and Ben G. Blake. Distribution of the Sagebrush Lizard, <i>Sceloporus graciosus</i>, in the Black Hills of South Dakota. 2006. Unpublished report submitted to the South Dakota Department of Game, Fish, and Parks.
	Survey:	<ul style="list-style-type: none"> all amphibian and reptile species 	<ul style="list-style-type: none"> Short-horned lizard (<i>Phrynosoma hernandesi</i>) survey in South Dakota 2008 – 2009. Final Report Submitted to the South Dakota Department of Game, Fish and Parks 31 December 2009. Hugh Quinn, Brian Smith, Holly Quinn and Gwen H. Writer.

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

<p>Amphibians and Reptiles (continued)</p>	<p>Survey:</p> <p>Create a downloadable smart phone/computer application using the Field Guide to Amphibians and Reptiles of South Dakota to assist with statewide monitoring efforts (AK).</p>	<ul style="list-style-type: none"> • all herpetofauna 	
	<p>Survey:</p> <ul style="list-style-type: none"> • Habitat surveys in foraging habitat characterization (BS). 	<ul style="list-style-type: none"> • Sagebrush Lizard 	
	<ul style="list-style-type: none"> • Survey potential ornate box turtle sites identified via GIS technology by Higa et al. 2012 (HQ). 	<ul style="list-style-type: none"> • Ornate Box Turtle 	
	<p>Research:</p> <ul style="list-style-type: none"> • Examine the scope of aquatic turtle mortality as bycatch in fish traps (HQ). 	<ul style="list-style-type: none"> • False Map Turtle • Smooth Softshell 	
	<ul style="list-style-type: none"> • Identify areas where large concentrations of smooth softshells overwinter, and produce plans to manage those areas (HQ). • Survey rivers in northern and western SD (HQ) 	<ul style="list-style-type: none"> • Smooth Softshell 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Amphibians and Reptiles (continued)	<p>Survey:</p> <ul style="list-style-type: none"> Survey Missouri River north of Pierre (HQ) 	<ul style="list-style-type: none"> False Map Turtle 	
	<p>Survey:</p> <ul style="list-style-type: none"> Continue surveys of greater short-horned lizards to better understand their distribution in the state. Use of predictive ecological niche modeling should further help define appropriate areas to search (HQ). 	<ul style="list-style-type: none"> Greater Short-horned Lizard 	
	<p>Policy/Enforcement:</p> <ul style="list-style-type: none"> Encourage enactment of tribal law to provide protection of ornate box turtles on Pine Ridge and Rosebud Reservations (HQ). 	<ul style="list-style-type: none"> Ornate Box Turtle 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
	<ul style="list-style-type: none"> Conduct pitfall trap as well as visual surveys for many-lined skinks and common earless lizards in areas of sandy soils in Fall River, Shannon, Custer, Pennington, Jackson, Bennett, Mellette, Todd, Tripp and potentially Gregory Counties (HQ). <p>Research:</p> <ul style="list-style-type: none"> Collect and analyze molecular genetic population data of greater short-horned lizards and sagebrush lizards to examine population differentiation, gene flow, and populations potentially at risk due to low genetic variation (HQ & BS). 	<ul style="list-style-type: none"> Many-lined Skink Common Earless Lizard Greater Short-horned Lizard Sagebrush Lizard 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Amphibians and Reptiles (continued)	<ul style="list-style-type: none"> Examine micro- and macro-habitat use of greater short-horned lizards and sagebrush lizards to better understand the requirements of this species in South Dakota (HQ & BS). 	<ul style="list-style-type: none"> Greater Short-horned Lizard Sagebrush Lizard 	<ul style="list-style-type: none"> Quinn, Hugh, Brian Smith, and Gwen H. Writer. 2009. Short-horned lizard (<i>Phrynosoma hernandesi</i>) in South Dakota 1008 – 2009. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
Lizards	<ul style="list-style-type: none"> Conduct genetic analyses of many-lined skink and common earless lizard populations to determine the distinctiveness of South Dakota populations from those in other parts of their ranges (HQ). 	<ul style="list-style-type: none"> Many-lined Skink 	
Snakes	<p>Research:</p> <ul style="list-style-type: none"> Define patterns of genetic variation and differentiation among South Dakota eastern hog-nosed snake populations, and compare these to populations outside the state (HQ). 	Eastern Hognose Snake	<ul style="list-style-type: none"> Quinn, Hugh, Brian Smith, and Gwen H. Writer. 2009. Short-horned lizard (<i>Phrynosoma hernandesi</i>) in South Dakota 2008 – 2009. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota. Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota. Brian E. Smith, Jodi L. Massie, and Ben G. Blake. Distribution of the Sagebrush Lizard, <i>Sceloporus graciosus</i>, in the Black Hills of South Dakota. 2006. Unpublished report submitted to the South Dakota Department of Game, Fish, and Parks.
	<ul style="list-style-type: none"> Identify specific areas of high lined snake road mortality, and design methods to ameliorate such losses (HQ). 	<ul style="list-style-type: none"> Lined Snake 	
	<ul style="list-style-type: none"> Conduct genetic analyses to determine the distinctiveness of South Dakota lined snake populations from those in other parts of their range (HQ). 	<ul style="list-style-type: none"> Lined Snake 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Snakes	<ul style="list-style-type: none"> Long-term mark-recapture studies to track population densities through time (BS) 	<ul style="list-style-type: none"> snake species 	<ul style="list-style-type: none"> Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota. Massie, J.L., B.E. Smith, and H. Quinn. 2013. Redbelly snake (<i>Storeria occipitomaculata</i>) and smooth greensnake (<i>Opheodrys vernalis</i>) activity along roadways near a presumed hibernaculum. Report to South Dakota Department of Game, Fish, and Parks, Pierre, South Dakota. http://www.parcplace.org/publications/parcas-priority-amphibian-and-reptile-conservation-areas.html
	<p>Policy:</p> <ul style="list-style-type: none"> Participate in identification of Priority Amphibian and Reptile Conservation Areas (PARCAs) through regional Partners in Amphibian and Reptile Conservation (PARC) chapters 	<ul style="list-style-type: none"> all species 	
	<ul style="list-style-type: none"> Conduct genetic analyses to determine the distinctiveness of South Dakota lined snake populations from those in other parts of their range (HQ). 	<ul style="list-style-type: none"> Lined Snake 	
	<p>Survey:</p> <ul style="list-style-type: none"> Survey dunes in the Hecla area to see if this is still present. Identify threats (intensive grazing). Spomer’s recent habitat evaluation indicated some areas that were heavily grazes and dunes trampled. Continued presence at this site may depend on remaining undisturbed or lightly disturbed dunes (SS). Clean (undisturbed) blowouts need to be identified inland or on shores of lakes or river. (SS) 	<ul style="list-style-type: none"> Little White Tiger Beetle 	

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

TERRESTRIAL INSECTS			
Indian Creek Tiger Beetle	Survey: <ul style="list-style-type: none"> Continual monitoring of these species. Due to continued loss of prairie habitats in NE SD it is important to locate larval and adult populations of insects dependent on prairie habitats (AK). 	<ul style="list-style-type: none"> Indian Creek Tiger Beetle 	
Little White Tiger Beetle	Survey: <ul style="list-style-type: none"> Continued monitoring of these species 	<ul style="list-style-type: none"> Dakota Skippers, other prairie butterflies 	
Northern Sandy Tiger Beetle	Research: <ul style="list-style-type: none"> Continued participation in captive propagation and reintroduction efforts 	<ul style="list-style-type: none"> Northern Sandy Tiger Beetle 	
Indian Creek Tiger Beetle	Survey: <ul style="list-style-type: none"> Periodically survey occupied area to monitor population status and trends 	<ul style="list-style-type: none"> Indian Creek Tiger Beetle 	
Dakota Skipper and other prairie butterflies	Survey: <ul style="list-style-type: none"> Periodically survey occupied area to monitor population status and trends 	<ul style="list-style-type: none"> Dakota Skippers, other prairie butterflies 	<ul style="list-style-type: none"> Dennis Skadsen contract work Dennis Skadsen contract work in association with Minnesota Zoo

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Dakota Skipper and other prairie butterflies (continued)	Research: Continued participation in captive propagation and reintroduction efforts	<ul style="list-style-type: none"> Dakota Skippers, other prairie butterflies 	
American Burying Beetle	Survey: <ul style="list-style-type: none"> Periodically survey occupied area to monitor population status and trends 		<ul style="list-style-type: none"> Backlund, D. C., G. M. Marrone, C. K. Williams, and K. Tillman. 2008. Population Estimate of the Endangered American Burying Beetle, <i>Nicrophorus americanus</i>, Olivier (Coleoptera: Silphidae) in South Dakota. The Coleopterists Bulletin 62(1): 9-15.

^aRespondents to South Dakota Wildlife Action Plan research and survey needs assessment request.

Respondent	Code	Affiliation	Topics
Katie Bertrand	(KBaquatic)	South Dakota State University	fish
Kerry Burns	(KeB)	Black Hills National Forest	birds and bats, Black Hills
Charles Dieter	(CD)	South Dakota State University	birds, mammals
Nancy Drilling	(ND)	Rocky Mountain Bird Observatory	birds, habitats
Randy Griebel	(RG)	Nebraska National Forest	black-footed ferrets and related issues
Mick Hanan	(MH)	US Fish and Wildlife Service, Lake Andes NWR	birds, habitats
Steve Hummel	(SHaquatic)	Odonata Central	aquatic insects-Odonata
Alyssa Kiesow	(AK)	Northern State University	herptiles, mammals
Dave Lucchesi	(DLaquatic)	SDGFP	fish
Keith Perkins	(KPaquatic)	University of Sioux Falls	mussels
Hugh Quinn	(HQ)	Oglala Lakota College/Black Hills State University	reptiles, amphibians

South Dakota Wildlife Action Plan

Appendix I (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for terrestrial animal species groups.

Mark Rumble	(MR)	USFS, Rocky Mountain Forest and Range Experiment Station	birds, habitats
Will Saylor	(WSaquatic)	SDGFP	fish
Brian Smith	(BS)	Black Hills State University	reptiles, amphibians
Steve Spomer	(SS)	University of Nebraska-Lincoln	terrestrial insects
Sam Stukel	(SSaquatic)	SDGFP	fish (i.e. Pallid Sturgeon, Blue Sucker, Sturgeon Chub, Sicklefin Chub)
David Swanson	(DS)	University of South Dakota	birds, amphibians
Joel Tigner	(JT)	BatWorks Consulting	bats

South Dakota Wildlife Action Plan

Appendix J. Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

Species or species group	Future or ongoing survey needs Future research needs Educational or coordination needs (Initials indicate respondents ^a)	Relevant SGCN	Related completed or ongoing projects
All SGCN			
<p>Educational or coordination:</p> <ul style="list-style-type: none"> • Improve and increase collaboration and communication • Promote and improve conservation programs and incentives • Increase environmental efforts about the ecological, economic, and social values of aquatic SGCN • Establish standardized surveys and status assessments for native species, especially SGCN • Continue to build voucher, reference collections for all aquatic biodiversity • Follow up on recommendations from completed research projects • Focus conservation on the best opportunities • Promote management that focuses on conserving aquatic biodiversity 			
FRESHWATER MUSSELS			
all mussels	<p>Survey:</p> <ul style="list-style-type: none"> • Establish baseline status & distribution information. • Facilitate a state-wide comprehensive survey, (particularly eastriver KPaquatic). • Facilitate a long-term monitoring program. 	<ul style="list-style-type: none"> • Elktoe • Rock Pocketbook • Higgins Eye • Yellow Sandshell • Creek Heelsplitter • Scaleshell • Hickorynut • Pimpleback • Mapleleaf 	<p>Survey:</p> <ul style="list-style-type: none"> • Backlund, D. 1996. Freshwater Mussel Survey of the Medicine Knoll Creek Area, Hughes County, South Dakota. Unpublished Report, South Dakota Game, Fish and Parks. • Ecological Specialists, Inc. 1998. Final Report: Unionid Survey in Lake Sharpe, South Dakota and Possible Effects of Drawdown. Prepared for U.S. Army Corps of Engineers Omaha District, Omaha, NE.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

all mussels (continued)			<p>Survey:</p> <ul style="list-style-type: none"> • Ecological Specialists, Inc. 2005. Characterization of Unionid Communities at three sites in the Missouri River at river miles 810.0, 769.8, and 761.5. Prepared for U.S. Army Corps of Engineers Omaha District, Omaha, NE. • Hoke, E. 1983. Unionid Mollusks of the Missouri River on the Nebraska Border. American Malacological Bulletin 1:71-74. • Hoke, E. 2003. Investigations on the distributions of freshwater mussels in the Missouri River reservoirs of South Dakota. Final Report to South Dakota Game, Fish and Parks, Pierre, South Dakota. Perkins, K. III. 1975. Distribution and Relative Abundance of the Unionid Mussels in the Vermillion River, S.D. MS Thesis, University of South Dakota, Vermillion. • Perkins, K. III., D. Skadsen, and D.C. Backlund. 1995. A survey for unionid mussels in Day, Deuel, Grant, and Roberts Counties, South Dakota. South Dakota Game, Fish and Parks, Pierre, South Dakota. • Perkins, K. III., and D.C. Backlund. 2000. Freshwater mussels of the Missouri National Recreational River below Gavin's Point Dam, South Dakota and Nebraska. South Dakota Game, Fish and Parks Report 2000-1. • Perkins, K. III., and D.C. Backlund. 2003. A survey for winged mapleleaf (<i>Quadrula fragosa</i>) and scaleshell (<i>Leptodea leptodon</i>) in the James River, South Dakota. South Dakota Game, Fish and Parks Report 2003-17. • Skadsen, D. 1998. A report on the results of a survey for Unionid mussels on the Upper and Middle Big Sioux River and tributaries: Grant, Codington, Hamlin, Brookings, and Moody Counties, South Dakota. South Dakota Game, Fish and Parks Report 1998-02.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

all mussels (continued)			<ul style="list-style-type: none"> • Shearer, J., D. Backlund, and S.K. Wilson. 2005. Freshwater mussel survey of the 39-mile district-Missouri National Recreational River, South Dakota and Nebraska. South Dakota Game, Fish and Parks Report 2005-08.
	<p>Research:</p> <ul style="list-style-type: none"> • Identify suitable & critical habitats. • Conduct research on life history requirements. • Examine reproductive behaviors: identify hosts, seasonal timing, & environmental variables. • Identify if & where recruitment is occurring. • Research genetic variation. • Identify limiting factors in current populations, such as host fish presence & distributions, & critical densities to maintain recruitment. 		
	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness of mussels & their link to healthy ecosystems thru education & outreach. • Develop a Field Guide to the Freshwater Mussels of South Dakota. 		<p>Education:</p> <ul style="list-style-type: none"> • South Dakota Game, Fish, and Parks. (In preparation). Rare species field guide. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish and Parks. (In preparation). Wildlife Action Plan Interactive website. South Dakota Game, Fish, and Parks.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

GASTROPODS			
Gastropods	<p>Survey:</p> <ul style="list-style-type: none"> • Periodic surveys to monitor population status and trends 	<ul style="list-style-type: none"> • Dakota Vertigo • Mystery Vertigo • Frigid Ambersnail • Cooper's Rocky Mountainsnail 	<ul style="list-style-type: none"> • Anderson, T., R. Guralnick, and K. Weaver. 2006. Endemism and population relationships of the Black Hills Oreohelix snails – Final Report. • Anderson, T. K., K. F. Weaver, and R. P. Guralnick. 2007. Variation in adult shell morphology and life-history traits in the land snail <i>Oreohelix cooperi</i> in relation to biotic and abiotic factors. <i>Journal of Molluscan Studies</i> 73: 129-137. • Weaver, K., T. K. Anderson, and R. P. Guralnick. 2006. Combining phylogenetic and ecological niche modeling approaches to determine distribution and historical biogeography of the Black Hills Mountain Snails (Oreohelicidae). <i>Diversity and Distributions</i> 12:756-766. • Anderson, T. K and C. Schmidt. 2007. Population dynamics of a land snail species of conservation concern in the Black Hills. <i>Intermountain Journal of Sciences</i> 13:13-31. • Anderson, T. K. 2004. Field Guide to Black Hills Land Snails. Natural History Inventory Publication No. 22. University of Colorado Museum. • Anderson, T. K. 2004. A Review of the U.S. distribution of <i>Melanoides tuberculatus</i> (Muller, 1774), an exotic freshwater snail. <i>Ellipsar</i> 6(2): 15-18.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

FISHES			
Statewide Cyprinidae (Minnows)	<p>Survey:</p> <ul style="list-style-type: none"> • Determine baseline surveys and status assessments (completed for Topeka Shiner). • Facilitate a management plan (completed for Topeka Shiner). • Develop & implement a monitoring program to evaluate management goals and provide baseline data in 11 watersheds (33 sites) once every three years (Ongoing for Topeka Shiner). • Implement Topeka Shiner monitoring at a minimum of 3 sites per watershed (88 sites) for the remaining watersheds not included within the ongoing monitoring program (10 streams in the James, 5 streams in the Vermillion, and 14 streams in the Big Sioux River basins). 	<ul style="list-style-type: none"> • Blacknose Shiner • Carmine Shiner • Finescale Dace • Hornyhead Chub • Lake Chub • Northern Pearl Dace • Northern Redbelly Dace • Sicklefin Chub • Southern Redbelly Dace • Sturgeon Chub • Topeka Shiner 	<p>Survey:</p> <ul style="list-style-type: none"> • Glacial relict fishes in spring-fed headwater streams of South Dakota’s Sandhills region (T2-8-R-1). (Completion Date: December 2013). • Keya Paha Watershed Project with Nebraska (U-4-HM-1). (Completion Date: September 2016). • Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams (T-12-R). Completed 2007. • Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams (Round Two) (T2-9-R-1). Completed 2012. • Bailey, R.M., and Allum, M.O. 1962. Fishes of South Dakota (No. 119). Ann Arbor: Museum of Zoology, University of Michigan. • Bertrand, K. 2010. South Dakota Scientific Collector’s Permit. South Dakota Game, Fish, and Parks. • Bertrand, K. 2011. South Dakota Scientific Collector’s Permit. South Dakota Game, Fish, and Parks. • Blausey, C.M. 2001. The status and distribution of the Topeka shiner <i>Notropis topeka</i> in eastern South Dakota. MS. Thesis. South Dakota State University, Brookings. • Cunningham, G.R. and R.D. 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. Proceedings of the South Dakota Academy of Sciences 74:55-64.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

Statewide Cyprinidae (Minnows)	<p>Survey: (continued)</p> <ul style="list-style-type: none"> • Cunningham, G.R., and S.M. Hickey. 1997. Topeka shiner (<i>Notropis topeka</i>) survey at selected sites within the James and Big Sioux river drainages in South Dakota. Eco-Centrics, Omaha, NE. 39 pp. • Cunningham, G.R. 1999. A survey for the Topeka shiner (<i>Notropis topeka</i>) within the Big Sioux, Vermillion, and James river basins in South Dakota. Eco-Centrics, Omaha, NE. 73 pp. • Cunningham, G.R. 1999. Rare fish surveys in selected streams of eastern South Dakota. 1999 Survey. Wildlife Diversity Small Grant Report. • Cunningham, G.R. 2002. Topeka shiner surveys and population estimates in eastern South Dakota survey year 1999. Eco-Centrics, Omaha, NE. • Cunningham, G.R. 2006. Pearl dace (<i>Margariscus margarita</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Dieterman, D.J. and C.R. Berry, Jr. 1994. Fishes in seven streams of the Minnesota River drainage in north eastern South Dakota. Proceedings of the South Dakota Academy of Sciences 73:23-30. • Heakin, A., N. Morey, and C. Berry, Jr. 2003. Environmental monitoring and assessment program activities in South Dakota. Annual progress report. South Dakota Game, Fish, and Parks by U.S. Geological Survey. • Isaak, D.J., W.A. Hubert, and C.R. Berry, Jr. 2002. Conservation assessment for lake chub, mountain sucker, and finescale dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region. • 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. Proceedings of the South Dakota Academy of Sciences 53:202-219. • Morey, N.M. and C.R. Berry, Jr. 2004. New distributional records of the northern redbelly dace in the northern Great Plains. The Prairie Naturalist 36(4):257-260. • Morey, N. 2005. A survey of fishes from Snake Creek in the upper James River watershed. South Dakota Department of Transportation. • Moyle, J.B. and W.D. Clothier. 1959. Effects of management and winter oxygen levels on the fish populations of a prairie lake. Transactions of the American Fisheries Society 88:178-185. • Pasbrig, C.A. and D.O. Lucchesi. 2012. Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams (2010-2012). Unpublished report #T2-9-R-1. South Dakota Game, Fish and Parks. • Schultz, L. D., S. J. Lewis, and K. N. Bertrand. 2012. Fish assemblage structure in Black Hills, South Dakota streams. Prairie Naturalist 44:98-104.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Cyprinidae (Minnows)</p>	<p>Survey: (continued)</p> <ul style="list-style-type: none"> • Shearer, J.S. 2003. Topeka shiner (<i>Notropis topeka</i>) management plan for the state of South Dakota. Wildlife Division Report 2003-10. South Dakota Game, Fish, and Parks. • 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. April 2012. (SSaquatic) • 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. April 2012. • Stasiak, R. 2006. Lake Chub (<i>Couesius plumbeus</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Stasiak, R. 2006. Northern redbelly dace (<i>Chrosomus eos</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Stasiak, R. and G.R. Cunningham. 2006. Finescale dace (<i>Chrosomus neogaeus</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Stukel, S., J. Kral, and N. Loecher. 2011. 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. (SSaquatic) • Wall, S.S., C.M. Blausey, J.A. Jenks, and C.R. Berry, Jr. 2001. Topeka shiner (<i>Notropis topeka</i>) population status and habitat conditions in South Dakota. South Dakota Cooperative Fish and Wildlife Research Unit, Completion Report, Research Work Order 73, Brookings. • Wall, S.S. 2002. Dawson Creek Survey (2002). Unpublished report. South Dakota Game, Fish, and Parks. • Wall, S.S. 2005. Topeka Shiner (<i>Notropis topeka</i>) Monitoring in Eastern South Dakota Streams. Unpublished report. South Dakota Game, Fish, and Parks. • Wall, S.S. 2006. Topeka Shiner (<i>Notropis topeka</i>) Monitoring in Eastern South Dakota Streams. Unpublished report. South Dakota Game, Fish, and Parks. • Wall, S.S. and S.K. Thomson. 2007. Topeka shiner (<i>Notropis topeka</i>) monitoring in eastern South Dakota streams (2004-2006). Unpublished report. South Dakota Game, Fish and Parks.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Cyprinidae (Minnows)</p>	<p>Survey: (continued)</p>	<ul style="list-style-type: none"> • Wall, S.S. and S.K. Thomson. 2009. Population estimate of Topeka shiners within a watershed in eastern South Dakota. Unpublished report. South Dakota, Game, Fish, and Parks. • Wall, S.S. and S.K. Wall. 2010. Variations and trends in population estimates of Topeka shiners in eastern South Dakota. Unpublished report. South Dakota Game, Fish, and Parks.
<p>Statewide Cyprinidae (Minnows) (continued)</p>	<p>Research:</p> <ul style="list-style-type: none"> • Identify critical habitats. • Assess population dynamics. • Research life history characteristics and feeding habitats in South Dakota. • Research genetic variation. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 	<p>Research:</p> <ul style="list-style-type: none"> • Anderson, C.M. and S.K. Sarver. 2008. Development of polymorphic microsatellite loci for the endangered Topeka shiner, <i>Notropis topeka</i>. Molecular Ecology Resources 8:311-313. • Blank, M., R. Bramblett, J. Cahoon, T. McMahon, O. Stein, S. Kalinowski. 2006. Impacts of Barriers on Topeka shiner populations SD2006-07. Western Transportation Institute. South Dakota Department of Transportation. • Cunningham, G.R. 2002. Road and bridge construction best management practices for stream sites inhabited by <i>Notropis topeka</i> (Topeka shiner). Report to the South Dakota Department of Transportation, Pierre. • Cunningham, G.R. 2006. Pearl dace (<i>Margariscus margarita</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Isaak, D.J., W.A. Hubert, and C.R. Berry, Jr. 2002. Conservation assessment for lake chub, mountain sucker, and finescale dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region. • Sarver, S.K. 2001. Development of DNA fingerprinting markers in Topeka shiner. Final Report to South Dakota Game, Fish & Parks, Pierre, South Dakota. • Stasiak, R.H. 1978. Reproduction, Age, and Growth of the Finescale Dace, <i>Chrosomus neogaeus</i>, in Minnesota. Transactions of the American Fisheries Society 107(5):720-723. • Stasiak, R. 2006. Northern redbelly dace (<i>Chrosomus eos</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Stasiak, R. and G.R. Cunningham. 2006. Finescale dace (<i>Chrosomus neogaeus</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Cyprinidae (Minnows) (continued)</p>	<p>Research: (continued)</p>	<ul style="list-style-type: none"> • Thompson, S.K. 2008. The influence of livestock watering ponds (dugouts) on native stream fishes, especially the endangered Topeka shiner (<i>Notropis topeka</i>). Master's thesis. South Dakota State University. Brookings, SD. • Toline, C.A. and A.J. Baker. 1995. Mitochondrial DNA variation and population genetic structure of the northern redbelly dace (<i>Phoxinus eos</i>). <i>Molecular ecology</i>, 4(6):745-754. • Wall, S.S. and C.R. Berry, Jr. 2002. Inventory and mitigation of culverts crossing streams inhabited by Topeka shiners (<i>Notropis topeka</i>) in South Dakota – Draft. South Dakota Department of Transportation, Pierre, South Dakota. • Wall, S.S. and C.R. Berry, Jr. 2004. Road culverts across streams with the endangered topeka shiner, <i>Notropis topeka</i>, in the James, Vermillion, and Big Sioux River basins. <i>Proceedings of the South Dakota Academy of Science</i> 83: 125-135. • Wall, S.S. and C.R. Berry, Jr. 2006. The importance of multiscale habitat relations and biotic associations to the conservation of an endangered fish species, the Topeka shiner. <i>American Fisheries Society Symposium</i> 48: 305-322. 	
	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness of Cyprinids & their link to healthy ecosystems through education & outreach. • Create a Field Guide to the nongame fishes of South Dakota. 	<p>Education:</p> <ul style="list-style-type: none"> • Ashton, D.E. and E.M. Dowd. 2006. <i>Fragile Legacy: Rare Animals of South Dakota</i>. South Dakota Game, Fish, and Parks. 2nd Edition. Report No. 91-04. • South Dakota Game, Fish, and Parks. (In preparation). Rare species field guide. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish, and Parks. (In preparation). Wildlife Action Plan Interactive website. South Dakota Game, Fish, and Parks. 	
<p>Pallid Sturgeon</p>	<p>Survey:</p> <ul style="list-style-type: none"> • Facilitate a management plan (completed). • Develop & implement a monitoring program to evaluate management goals and provide baseline data (Ongoing). • Develop standardized protocols for monitoring all life history stages. 	<ul style="list-style-type: none"> • False Map Turtle • Pallid Sturgeon • Shovelnose Sturgeon • Sicklefin Chub • Smooth Softshell Turtle • Sturgeon Chub 	<p>Survey:</p> <ul style="list-style-type: none"> • 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.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Pallid Sturgeon (continued)</p>	<p>Survey: (continued)</p>	<ul style="list-style-type: none"> • 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. • 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. April 2012. • Stukel, S., J. Kral, and N. Loecher. 2011. 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. • U.S. Fish and Wildlife Service. 1993. Pallid Sturgeon Recovery Plan. USFWS, Bismarck, North Dakota. 55 pp.
	<p>Research:</p> <ul style="list-style-type: none"> • Evaluate the role of sediment transport & discharge on the creation & maintenance of habitats for all life stages. • Identify limiting factors associated with natural recruitment including environmental factors, microhabitat features, predation, and pollution. • Research spawning & potential natural recruitment below Gavins Point Dam. What are the factors influencing egg and age-0 juvenile survival? • Investigate seasonal movements, use, and potential spawning on the James River for all life stages. 	<p>Research:</p> <ul style="list-style-type: none"> • Development and application of a habitat assessment tool for juvenile Pallid Sturgeon in the upper Missouri River (T-24-R). Completed 2008. • Chipps, S.R., R.A. Klumb and E.B. Wright. 2008. Development and Application of Juvenile Pallid Sturgeon Bioenergetics Model. Final Report, State Wildlife Grant Program, Study T-24-R Study No. 2424. Submitted to South Dakota Department of Game, Fish and Parks, Pierre, SD. • French, W.E., B.D.S. Graeb, S.R. Chipps, K.N. Bertrand, and R.A. Klumb. In Press. Size-Dependent trophic patterns of Pallid Sturgeon and Shovelnose Sturgeon in a large river system. <i>Journal of Fish and Wildlife Management</i>. • French, W. E., B. D. S. Graeb, S. R. Chipps, K. N. Bertrand, T. M. Selch and R. A. Klumb. 2010. Vulnerability of age-0 pallid sturgeon <i>Scaphirhynchus albus</i> to fish predation, <i>J. Appl. Ichthyol.</i> 26: 6-10.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Pallid Sturgeon (continued)</p>	<p>Research: (continued)</p>	<ul style="list-style-type: none"> • Grohs, K.L. 2008. Macroinvertebrate composition and patterns of prey use by juvenile pallid sturgeon (<i>Scaphirhynchus albus</i>) in the Missouri River, South Dakota and Nebraska. M.S. Thesis, South Dakota State University, Brookings. • Grohs, K. L., R. A. Klumb, S. R. Chipps and G. A. Wanner. 2009. Ontogenetic patterns in prey use by pallid sturgeon in the Missouri River, South Dakota and Nebraska. J. Appl. Ichthyol. 25: 48-53. • 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. • Shuman, D. A., D. W. Willis, and S. C. Krentz. 2006. Application of a length-categorization system for pallid sturgeon (<i>Scaphirhynchus albus</i>). Journal of Freshwater Ecology 21:71-78. • Shuman, D. A., R. A. Klumb, R. Wilson, M. Jaeger, T. Haddix, B. Gardner, W. Doyle, P. Horner, M. Ruggles, K. Steffensen, S. Stukel, and G. A. Wanner. 2011. Pallid sturgeon growth, condition, and size structure within the Missouri River basin. Journal of Applied Ichthyology 27:269-281. • Sloss, B. L., R. A. Klumb, and E. J. Heist. 2009. Genetic conservation and paddlefish propagation. American Fisheries Society Symposium 66:307-327. • Spindler, B.D. 2008. Modeling spatial distribution and habitat associations for juvenile pallid sturgeon (<i>Scaphirhynchus albus</i>) in the Missouri River. M.S Thesis, South Dakota State University, Brookings. • Spindler, B.D. 2008. Modeling spatial distribution and habitat associations for juvenile pallid sturgeon (<i>Scaphirhynchus albus</i>) in the Missouri River. M.S Thesis, South Dakota State University, Brookings. • Spindler, B. D., S. R. Chipps, R. A. Klumb and M. C. Wimberly. 2009. Spatial analysis of pallid sturgeon <i>Scaphirhynchus albus</i> distribution in the Missouri River, South Dakota. J. Appl. Ichthyol. 25: 8-13. • Spindler, B.D., S.R. Chipps, R.A. Klumb, B.D.S. Graeb, and M.C. Wimberly. 2012. Habitat and prey availability attributes associated with juvenile and early adult pallid sturgeon occurrence in the Missouri River, USA. Endangered Species Research Vol. 16: 225-234.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Pallid Sturgeon (continued)</p>	<p>Research: (continued)</p>	<ul style="list-style-type: none"> • Wanner, G. A., R. A. Klumb, G. R. Jordan, and W. J. Stancill. 2007. Habitat use and movements of adult pallid sturgeon in the Missouri River downstream of Fort Randall Dam, South Dakota and Nebraska. <i>Proceedings of the South Dakota Academy of Science</i> 86:21-33. • Wanner, G. A., D. A. Shuman, M. L. Brown, and D. W. Willis. 2007. An initial assessment of sampling procedures for juvenile pallid sturgeon in the Missouri River downstream of Fort Randall Dam, South Dakota and Nebraska. <i>Journal of Applied Ichthyology</i> 23:529-538. • Wanner, G. A., D. A. Shuman, and D. W. Willis. 2006. Food habits of juvenile pallid sturgeon and adult shovelnose sturgeon in the Missouri River below Fort Randall Dam, South Dakota. <i>Journal of Freshwater Ecology</i> 22:81-92. • Wanner, G. A. 2006. Evaluation of a gastric lavage method on juvenile pallid sturgeon. <i>North American Journal of Fisheries Management</i> 26:587-591.
	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness of Pallid Sturgeon monitoring and recovery efforts thru education & outreach. 	<ul style="list-style-type: none"> • Ashton, D.E. and E.M. Dowd. 2006. <i>Fragile Legacy: Rare Animals of South Dakota</i>. South Dakota Game, Fish, and Parks. 2nd Edition. Report No. 91-04. • South Dakota Game, Fish, and Parks. (In preparation). <i>Rare species field guide</i>. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish, and Parks. (In preparation). <i>Wildlife Action Plan Interactive website</i>. South Dakota Game, Fish, and Parks.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Catostomidae (Suckers)</p>	<p>Survey:</p> <ul style="list-style-type: none"> • Conduct baseline surveys and status assessments. 	<ul style="list-style-type: none"> • Longnose Sucker • Mountain Sucker • Blue Sucker 	<p>Survey:</p> <ul style="list-style-type: none"> • Conservation status of the mountain sucker (<i>Catostomus platyrhynchus</i>) in South Dakota (T2-2-R-1). Completed 2011. • Schultz, L. D. and K. N. Bertrand. 2012. Long term trends and outlook for mountain sucker in the Black Hills of South Dakota. <i>Am. Midl. Nat.</i> 167:96-110. • Schultz, L. D., S. J. Lewis, and K. N. Bertrand. 2012. Fish assemblage structure in Black Hills, South Dakota streams. <i>Prairie Naturalist</i> 44:98-104. • 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. April 2012. • Stukel, S., J. Kral, and N. Loecher. 2011. 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.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Catostomidae (Suckers) (continued)</p>	<p>Research:</p> <ul style="list-style-type: none"> • Identify critical habitats. • Assess population dynamics. • Research life history characteristics and feeding habitats in South Dakota. • Research genetic variation. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 	<ul style="list-style-type: none"> • Longnose Sucker • Mountain Sucker • Blue Sucker 	<p>Research:</p> <ul style="list-style-type: none"> • Belica, L.T. and N.P. Nibbelink. 2006. Mountain Sucker (<i>Catostomus platyrhynchus</i>): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. • Dauwalter, D.C., F.J. Rahel, S.R. Hirtzel, K.G. Gerow, and G.D. Hayward. 2008. MIS Monitoring Protocol for Mountain Sucker. Black Hills National Forest, USDA Forest Service, Region 2. • Isaak, D.J., W.A. Hubert, and C.R. Berry, Jr. 2002. Conservation assessment for lake chub, mountain sucker, and finescale dace in the Black Hills National Forest, South Dakota and Wyoming. USDA Forest Service, Rocky Mountain Region. • Morey, N.M. and C.R. Berry Jr. 2003. Biological characteristics of Blue Sucker in the James River and Big Sioux River, South Dakota. <i>Journal of Freshwater Ecology</i> 18(1): 33-41. • Schultz, L. D. 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. 102 pp. • Schultz, L. D. and K. N. Bertrand. 2011. An assessment of the lethal thermal maxima for mountain sucker. <i>Western North American Naturalist</i> 71(3):404-411.
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South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Catostomidae (Suckers) (continued)</p>	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness of Catostomids & their link to healthy ecosystems through education & outreach. • Create a Field Guide to the nongame fishes of South Dakota. 	<ul style="list-style-type: none"> • Longnose Sucker • Mountain Sucker • Blue Sucker 	<p>Education:</p> <ul style="list-style-type: none"> • Ashton, D.E. and E.M. Dowd. 2006. Fragile Legacy: Rare Animals of South Dakota. South Dakota Game, Fish, and Parks. 2nd Edition. Report No. 91-04. • South Dakota Game, Fish, and Parks. (In preparation). Rare species field guide. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish, and Parks. (In preparation). Wildlife Action Plan Interactive website. South Dakota Game, Fish, and Parks.
<p>Statewide Fundulidae (Killifishes & Topminnows)</p>	<p>Survey:</p> <ul style="list-style-type: none"> • Determine baseline surveys and status assessments. 	<ul style="list-style-type: none"> • Banded Killifish • Plains Topminnow** 	<p>Survey:</p> <ul style="list-style-type: none"> • Glacial relict fishes in spring-fed headwater streams of South Dakota’s Sandhills region (T2-8-R-1). (Completion Date: December 2013). • Keya Paha Watershed Project with Nebraska (U-4-HM-1). (Completion Date: September 2016). • Pasbrig, C.A., K.D. Koupal, S. Schainost, and W.W. Hoback. 2012. Changes in range-wide distribution of plains topminnow, <i>Fundulus sciadicus</i>. Endangered Species Research 16: 235-247.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

<p>Statewide Fundulidae (Killifishes & Topminnows)</p>	<p>Research:</p> <ul style="list-style-type: none"> • Identify critical habitats. • Determine population dynamics. • Research life history characteristics and feeding habitats. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Research genetic variation. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 	<ul style="list-style-type: none"> • Banded Killifish • Plains Topminnow** 	<p>Research:</p> <ul style="list-style-type: none"> • Schumann, D.A., C.A. Pasbrig, K.D. Koupal, and W.W. Hoback. 2012. Culture of Plains Topminnow in a pond constructed for species conservation. North American Journal of Aquaculture 74(3): 360-364.
	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness & interest of nongame fishes & their link to healthy ecosystems thru education & outreach. • Create a Field Guide of the nongame fishes of South Dakota. 		<p>Education:</p> <ul style="list-style-type: none"> • South Dakota Game, Fish, and Parks. (In preparation). Rare species field guide. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish, and Parks. (In preparation). Wildlife Action Plan Interactive website. South Dakota Game, Fish, and Parks.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

Statewide Percidae (Darters & Logperch)	Survey: <ul style="list-style-type: none"> • Determine baseline surveys and status assessments. 	<ul style="list-style-type: none"> • Blackside Darter • Logperch 	
	Research: <ul style="list-style-type: none"> • Identify critical habitats. • Determine population dynamics. • Research life history characteristics and feeding habitats. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Research genetic variation. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 		
	Education: <ul style="list-style-type: none"> • Increase awareness & interest of nongame fishes & their link to healthy ecosystems thru education & outreach. • Create a Field Guide of the nongame fishes of South Dakota. 		Education: <ul style="list-style-type: none"> • South Dakota Game, Fish, and Parks. (In preparation). Rare species field guide. CyberTracker. South Dakota Game, Fish, and Parks. • South Dakota Game, Fish, and Parks. (In preparation). Wildlife Action Plan Interactive website. South Dakota Game, Fish, and Parks.

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

Statewide Umbridae (Mudminnows)	<p>Survey:</p> <ul style="list-style-type: none"> • Determine baseline surveys and status assessments. 	<ul style="list-style-type: none"> • Central Mudminnow 	
	<p>Research:</p> <ul style="list-style-type: none"> • Identify critical habitats. • Determine population dynamics. • Research life history characteristics and feeding habitats. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Research genetic variation. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 		
	<p>Education:</p> <ul style="list-style-type: none"> • Increase awareness & interest of nongame fishes & their link to healthy ecosystems thru education & outreach. • Create a Field Guide of the nongame fishes of South Dakota. 		
Statewide Percopsidae (Trout-Perch)	<p>Survey:</p> <ul style="list-style-type: none"> • Determine baseline surveys and status assessments. 	<ul style="list-style-type: none"> • Trout-Perch 	

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

Statewide Percopsidae (Trout-Perch) (continued)	Research: <ul style="list-style-type: none"> • Identify critical habitats. • Determine population dynamics. • Research life history characteristics and feeding habitats. • Research seasonal movements & re-colonization capabilities after periods of intermittency. • Research genetic variation. • Identify limiting factors in current populations, such as presence of AIS or game fish species, land-use practices, & critical densities to maintain recruitment. 	<ul style="list-style-type: none"> • Trout-Perch 	
	Education: <ul style="list-style-type: none"> • Increase awareness & interest of nongame fishes & their link to healthy ecosystems thru education & outreach. • Create a Field Guide of the nongame fishes of South Dakota. 		

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

AQUATIC INSECTS			
all aquatic insects	<p>Survey:</p> <ul style="list-style-type: none"> Establish baseline status & distribution information. 	<ul style="list-style-type: none"> <i>Anaetris eximia</i>-A Mayfly <i>Epithea petechialis</i>-Dot-winged Baskettail <i>Stylurus notatus</i>-Elusive Clubtail <i>Perlesta dakota</i>-A Stonefly <i>Libellula saturate</i>-Flame Skimmer** <i>Brechmorhoga mendax</i>-Pale-faced Clubskimmer** <i>Argia lugens</i>-Sooty Dancer** <i>Erpetogomphus designates</i>-Eastern Ringtail (SHAquatic)** 	<p>Survey:</p> <ul style="list-style-type: none"> Huntsman, B. O., Baumann, R. W., & Kondratieff, B. C. (2001). The stoneflies (Plecoptera) of South Dakota. <i>Entomological News</i>, 112(2), 104-111.
	<p>Research:</p> <ul style="list-style-type: none"> Identify suitable & critical habitats. Conduct research on life history requirements. Determine limiting factors. 		
	<p>Education:</p> <ul style="list-style-type: none"> Increase awareness & interest of aquatic invertebrates & their link to healthy ecosystems thru education & outreach. 		

**Topic is of research and/or monitoring importance, but species is not listed as a species of greatest conservation need

South Dakota Wildlife Action Plan

Appendix J (continued). Species-level research and survey needs identified during the South Dakota Wildlife Action Plan revision for aquatic animal species groups.

^aRespondents to South Dakota Wildlife Action Plan research and survey needs assessment request.

Respondent	Code	Affiliation	Topics
Katie Bertrand	(KBaquatic)	South Dakota State University	fish
Kerry Burns	(KeB)	Black Hills National Forest	birds and bats, Black Hills
Charles Dieter	(CD)	South Dakota State University	birds, mammals
Nancy Drilling	(ND)	Rocky Mountain Bird Observatory	birds, habitats
Randy Griebel	(RG)	Nebraska National Forest	black-footed ferrets and related issues
Mick Hanan	(MH)	US Fish and Wildlife Service, Lake Andes NWR	birds, habitats
Steve Hummel	(SHAquatic)	Odonata Central	aquatic insects-Odonata
Alyssa Kiesow	(AK)	Northern State University	herptiles, mammals
Dave Lucchesi	(DLaquatic)	SDGFP	fish
Keith Perkins	(KPaquatic)	University of Sioux Falls	mussels
Hugh Quinn	(HQ)	Oglala Lakota College/Black Hills State University	reptiles, amphibians
Mark Rumble	(MR)	USFS, Rocky Mountain Forest and Range Experiment Station	birds, habitats
Will Saylor	(WSaquatic)	SDGFP	fish
Brian Smith	(BS)	Black Hills State University	reptiles, amphibians
Steve Spomer	(SS)	University of Nebraska-Lincoln	terrestrial insects
Sam Stukel	(SSaquatic)	SDGFP	fish (i.e. Pallid Sturgeon, Blue Sucker, Sturgeon Chub, Sicklefin Chub)
David Swanson	(DS)	University of South Dakota	birds, amphibians
Joel Tigner	(JT)	BatWorks Consulting	bats

South Dakota Wildlife Action Plan

Appendix K. Species-level species- or habitat-specific restoration needs.

Species, species group or habitat	Restoration needs (Initials indicate respondents ^a)	Relevant SGCN	Related completed or ongoing projects
reptiles, birds	<ul style="list-style-type: none"> • Restore (either artificially or through natural flooding) open beaches below dams along the Missouri river (HQ). 	<ul style="list-style-type: none"> • For needed nesting habitat: False Map Turtle, Smooth Softshell, Least Tern, Piping Plover • For needed required habitat for all life stages: Eastern Hog-nosed Snake 	<ul style="list-style-type: none"> • Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
migratory birds	<ul style="list-style-type: none"> • Characterization and protection of migration and wintering habitats in Central and South America 	<ul style="list-style-type: none"> • American White Pelican • Osprey • Ferruginous Hawk • Peregrine Falcon • Willet • Long-billed Curlew • Marbled Godwit • Wilson’s Phalarope • Black Tern • Burrowing Owl • Sprague’s Pipit • Lark Bunting • Baird’s Sparrow • Le Conte’s Sparrow • Chestnut-collared Longspur 	<ul style="list-style-type: none"> • Southern Wings Program is an international effort to link bird needs across breeding, migration and wintering habitats. SDGFP has contributed to a project in the Saltillo Grasslands in Mexico to help protect important wintering habitat for Ferruginous Hawk, Western Meadowlark, Chestnut-collared Longspur, and Grasshopper Sparrow.

South Dakota Wildlife Action Plan

Appendix K (continued). Species-level species- or habitat-specific restoration needs.

lizards	<ul style="list-style-type: none"> • Create areas of open sand (discouraging stabilization of sand dune habitats) in areas of Lacreek National Wildlife Refuge where common earless lizards are known to occur (HQ). 	<ul style="list-style-type: none"> • Common Earless Lizard 	<ul style="list-style-type: none"> • Smith, Brian E., and Hugh Quinn. 2012. Threats, management and suggested harvest and collection policy for herpetofauna of South Dakota. Report to South Dakota Game, Fish and Parks Department, Pierre, South Dakota.
Greater Sage-Grouse	<ul style="list-style-type: none"> • Identify sites in Fall River County with suitable lek, nesting, brood-rearing, and winter habitat (ND) • Reintroduce disease-free birds into Fall River County (ND) 	<ul style="list-style-type: none"> • Greater Sage-Grouse 	
sagebrush	<ul style="list-style-type: none"> • Investigate best propagation and planting methods for big sagebrush (ND) • Identify sites for big sagebrush restoration (ND) 	<ul style="list-style-type: none"> • Greater Sage-Grouse • Sagebrush Lizard 	
mussel SGCN	<ul style="list-style-type: none"> • Identify high priority sites & landowners for potential conservation & recovery (Locate within COAs). • Controlled propagation of mussels to discover methods & techniques best suited to recover declined &/or extirpated populations. 	<ul style="list-style-type: none"> • Elktoe • Rock Pocketbook • Higgins Eye • Yellow Sandshell • Creek Heelsplitter • Scaleshell • Hickorynut • Pimpleback • Mapleleaf 	
Topeka Shiner	<ul style="list-style-type: none"> • Identify high priority sites & landowners for potential conservation & recovery (Locate within COAs). 	<ul style="list-style-type: none"> • Topeka Shiner 	

South Dakota Wildlife Action Plan

Appendix K (continued). Species-level species- or habitat-specific restoration needs.

Pallid Sturgeon	<ul style="list-style-type: none"> Continued supplemental stockings needed (Ongoing). River corridor habitat protection through easements or purchase. (SSaquatic) 	<ul style="list-style-type: none"> Pallid Sturgeon 	<ul style="list-style-type: none"> Jordan, G. R., R. A. Klumb, G. A. Wanner, and W. J. Stancill. 2006. Post-stocking movements of hatchery-reared juvenile pallid sturgeon in the Missouri River below Fort Randall Dam, South Dakota and Nebraska. Transactions of the American Fisheries Society 135:1499-1511.
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^aRespondents to South Dakota Wildlife Action Plan research and survey needs assessment request.

Respondent	Code	Affiliation	Topics
Katie Bertrand	(KBaquatic)	South Dakota State University	fish
Kerry Burns	(KeB)	Black Hills National Forest	birds and bats, Black Hills
Charles Dieter	(CD)	South Dakota State University	birds, mammals
Nancy Drilling	(ND)	Rocky Mountain Bird Observatory	birds, habitats
Randy Griebel	(RG)	Nebraska National Forest	black-footed ferrets and related issues
Mick Hanan	(MH)	US Fish and Wildlife Service, Lake Andes NWR	birds, habitats
Steve Hummel	(SHaquatic)	Odonata Central	aquatic insects-Odonata
Alyssa Kiesow	(AK)	Northern State University	herptiles, mammals
Dave Lucchesi	(DLaquatic)	SDGFP	fish
Keith Perkins	(KPaquatic)	University of Sioux Falls	mussels
Hugh Quinn	(HQ)	Oglala Lakota College/Black Hills State University	reptiles, amphibians
Mark Rumble	(MR)	USFS, Rocky Mountain Forest and Range Experiment Station	birds, habitats
Will Saylor	(WSaquatic)	SDGFP	fish
Brian Smith	(BS)	Black Hills State University	reptiles, amphibians

South Dakota Wildlife Action Plan

Appendix K (continued). Species-level species- or habitat-specific restoration needs.

Steve Spomer	(SS)	University of Nebraska-Lincoln	terrestrial insects
Sam Stukel	(SSaquatic)	SDGFP	fish (i.e. Pallid Sturgeon, Blue Sucker, Sturgeon Chub, Sicklefin Chub)
David Swanson	(DS)	University of South Dakota	birds, amphibians
Joel Tigner	(JT)	BatWorks Consulting	bats

Appendix L. Assessment methods, data sources, and products for terrestrial, riparian, and wetland systems

Terrestrial Systems

Mapping Ecological Sites

SD WAP Product: ALL MLRAs TERRESTRIAL SDWAP.shp

Source GIS and tabular data:

1. U.S. Department of Agriculture National Resource Conservation Service. Soil survey geographic (SSURGO) database for all available counties in South Dakota
[\(http://SoilDataMart.nrcs.usda.gov/\)](http://SoilDataMart.nrcs.usda.gov/)
2. U.S. Fish and Wildlife Service, National Wetlands Inventory (<http://www.wetlands.fws.gov>) – South Dakota data.
3. U.S. Department of Agriculture National Resource Conservation Service. Major Land Resource Area (MLRA) GIS layer (<http://soils.usda.gov/survey/geography/mlra/>)

Methods: Steps used to develop the GIS layer for mapping the terrestrial (grass/shrub and forested) ecological sites for the state of South Dakota.

1. Acquire NRCS SSURGO GIS and associated ecological site and soils data for the state of South Dakota.
2. Acquire NRCS Major Land Resource Area (MLRA) GIS layer.
3. Union SSURGO and MLRA GIS layers
4. Identify and remove riparian and wetland ecological sites.
5. Identify and fill blanks in the data where ecological site has not been identified for a polygon by using best available information such as adjacent county/MLRA data or soils information to associate an ecological site to blank polygons, where possible.
6. Develop a standardized state-wide naming protocol for ecological site as some MLRAs used different names for the same ecological site.
7. Remove additional mapped riparian and wetland sites using the National Wetlands Inventory GIS layer.
8. Table L-1 identifies and describes the fields associated with the resulting GIS layer and the original data source for the field. Those fields added to facilitate additional application to the SD WAP are noted as “Developed for the SD WAP” in the data source column.

South Dakota Wildlife Action Plan

Table L-1. Field names, descriptions and data sources used in the development of the South Dakota Wildlife Action Plan ecological site layer for terrestrial ecosystems (ALL MLRAs TERRESTRIAL SDWAP.shp).

<i>FIELD NAME</i>	<i>DESCRIPTION</i>	<i>GIS/DATA SOURCE</i>
ECOSITEID	Same as “ecoclassid” found in SSURGO table “coecoclass”; refers to a particular ecological site – represents the concatenated form of ecological site type, ecological site MLRA, ecological site LRU, ecological site number, and ecological site state FIPS code	NRCS SSURGO; some blanks may have been filled for SD WAP
ECOSITENAM	Ecological site name that also includes the precipitation zone, where applicable; may or may not be the same name provided by NRCS SSURGO data; in a few instances a blank field may have been populated with an ecological site name based on interpretation of best available information (see number 4 in method description above)	NRCS SSURGO; some blanks may have been filled for SD WAP
MLRA	Corresponds to Major Land Resource Areas (MLRA) identified within state of South Dakota	NRCS MLRA
ECOSITE	Same as ECOSITEID but ecological site name only	NRCS SSURGO
PRECZONE	Same as ECOSITEID but precipitation zone only, where applicable	NRCS SSURGO
SYSTEM	Broad vegetation system category (i.e. grass-shrub, forested, etc.)	Developed by SDWAP

Identifying Land Use Impacts

Source GIS and tabular data:

1. SD WAP Terrestrial Ecological Site Layer (ALL MLRAs TERRESTRIAL SDWAP.shp) – see previous section for a description of this layer
2. 2006 National Land Cover Database (Landsat-based, 30 meter resolution, landcover GIS file and database); <http://www.mrlc.gov/index.php>

Methods: Steps used to identify and quantify current land use impacts by ecological site and MLRA.

1. Evaluate options for quantifying land use impacts across South Dakota.
2. Acquire 2006 NLCD GIS layer and associated database.
3. Overlay NLCD GIS layer with SD WAP developed Terrestrial Ecological site Layer.
4. Group land use codes into broader categories needed to meet objectives of SD WAP - see table L-2 below.

South Dakota Wildlife Action Plan

Table L-2. Groupings of National Land Cover Data (NLCD) Code/Classification used to meet the objectives of the South Dakota Wildlife Action Plan for assessing and quantifying land use impacts.

<i>SD WAP Grouped Category</i>	<i>NLCD Code/Classification</i>
Urban/Residential Development	21/Developed, Open Space
	22/Developed, Low Intensity
	23/Developed, Medium Intensity
	24/Developed, High Intensity
Agriculture	81/Pasture-Hay
	82/Cultivated Crops
Unconverted	41/Deciduous Forest
	42/Evergreen Forest
	43/Mixed Forest
	52/Scrub-Shrub
	71,64,65,66/Grassland-Herbaceous
	90/Woody Wetlands
	95/Emergent Herbaceous Wetland
	31/Barron Land

Native Ecosystem Plant Community Descriptions

SD WAP Product: SD WAP Database.accdb

Source Data:

1. Ecological Site Description Plant Community tables (provided by Stan Bolts, NRCS)

Methods:

1. Acquire all available and approved ecological site description plant community tables for the state of South Dakota.
2. Review all plant community descriptions relative to the state and transition model developed for the SD WAP and assign one of six disturbance states to each plant community where possible (see Section 3.3 for more information on disturbance states) based on understanding plant community characteristics in response to fire and grazing regimes.
3. Add information on expected historical fire and grazing regimes.
4. Check species common and scientific names, as well as codes, for consistency and update if necessary using NRCS PLANTS database.
5. Remove all non-native species included in the plant community descriptions to meet the objectives for identifying historical disturbance states/conditions described in the SD WAP.

South Dakota Wildlife Action Plan

6. Table L-3 identifies and describes the fields associated with the resulting database and the original data source for the field. Those fields added to facilitate additional application to the SD WAP are noted as “Developed for the SD WAP” in the data source column.

South Dakota Wildlife Action Plan

Table L-3. Field names, descriptions and data sources used in the development of South Dakota Wildlife Action Plan Database for native ecosystem plant communities.

<i>FIELD NAME</i>	<i>DESCRIPTION</i>	<i>DATA SOURCE</i>
MLRA	Major Land Resource Area (MLRA)	NRCS Plant Community Table
ECOSITEID	NRCS code for ecological site – represents the concatenated form of ecological site type, ecological site MLRA, ecological site LRU, ecological site number, and ecological site state FIPS code	NRCS Plant Community Table
ECOSITENAME	Ecological site name	NRCS Plant Community Table
DISTSTATE	Corresponds to the disturbance state codes described in Section 2.5.1	Developed for the SD WAP
PLANTCOMMUNITY	Common name for co-dominant species identified in the plant community	NRCS Plant Community Table
SYMBOL	NRCS PLANTS code that corresponds to the listed plant species	NRCS Plant Community Table
GROWTHFORM	General growth form for a plant species	NRCS Plant Community Table
MINCOMP	Minimum % composition (annual production) of a plant species	NRCS Plant Community Table
MAXCOMP	Maximum % composition (annual production) of a plant species	NRCS Plant Community Table
CCEXPCHANGE	The expected change in annual production based on climate change; described in Section 2.7.1.2.3	Developed for SD WAP
FIREREGIME	Frequency of historical fire disturbance influencing plant community; described in Section 2.5.1	Developed for SD WAP
GRAZINGREGIME	Intensity of historical bison grazing influencing plant community; described in Section 2.5.1	Developed for SD WAP
UNIQID	Unique identifier for each plant species occurring in a plant community	Developed for SD WAP
RV	The Representative Value (average value) expressed as lbs. per acre of annual production for a plant community	NRCS Plant Community Table
ECOSITEID_STATE	Code that represents concatenated ECOSITEID and DISTSTATE fields described above	Developed for SD WAP
COMMONNAME	Common name for a plant species (may have been updated using PLANTS database)	NRCS Plant Community Table
SCIENTIFICNAME	Scientific name for a plant species (may have been updated using PLANTS database)	NRCS Plant Community Table
PHOTOSYNTHETIC PATHWAY	Type of photosynthetic pathway used by a grass species (i.e. C ₃ , C ₄ , or CAM)	Developed for SD WAP

South Dakota Wildlife Action Plan

Riparian and Wetland Systems

Mapping Ecological Sites

SD WAP Product: All MLRAs RIPWET SDWAP.shp

Source GIS and tabular data:

1. U.S. Department of Agriculture National Resource Conservation Service. Soil survey geographic (SSURGO) database for all available counties in South Dakota (<http://SoilDataMart.nrcs.usda.gov/>)
2. U.S. Fish and Wildlife Service, National Wetlands Inventory (<http://www.wetlands.fws.gov>) – South Dakota data only.
3. U.S. Department of Agriculture National Resource Conservation Service. Major Land Resource Area (MLRA) GIS layer (<http://soils.usda.gov/survey/geography/mlra/>)

Methods: Steps used to develop the GIS layer for mapping the riparian and wetland ecological sites for the state of South Dakota.

1. Acquire SSURGO GIS and associated ecological site and soils data for the state of South Dakota.
2. Acquire NRCS Major Land Resource Area (MLRA) GIS layer.
3. Union SSURGO and MLRA GIS layers
4. Identify and remove terrestrial ecological sites.
5. Identify and fill blanks in the data where ecological site has not been identified for a polygon by using best available information such as adjacent county data or soils information to associate an ecological site to blank polygons, where possible.
6. Develop a standardized state-wide naming protocol for ecological site, as some MLRAs used different names for the same ecological site.
7. Acquire USFS National Wetlands Inventory (NWI) GIS and associated data for the state of South Dakota.
8. Merge SSURGO and NWI GIS layers and associated data.
9. Use existing SSURGO information to extrapolate ecological site classification where possible and appropriate. Also, where SSURGO information is unavailable, such as for NWI polygons, use NWI polygon information to interpret ecological site classification where possible and appropriate.
10. Table L-4 identifies and describes the fields associated with the resulting database and the original data source for the field. Those fields added to facilitate additional application to the SD WAP are noted as “Developed for the SD WAP” in the data source column.

South Dakota Wildlife Action Plan

Table L-4. Field names, descriptions and data sources used in the development of the South Dakota Wildlife Action Plan ecological site layer for riparian and wetland ecosystems (ALL MLRAs RIPWET SDWAP.shp).

<i>FIELD NAME</i>	<i>DESCRIPTION</i>	<i>GIS/DATA SOURCE</i>
MLRA	Corresponds to NRCS mapped Major Land Resource Areas (MLRA)	NRCS MLRA
ECOSITE_ID	For NRCS SSURGO polygons, same as “ecoclassid” found in SSURGO table “coecoclass” that represents the concatenated form of ecological site type, ecological site MLRA, ecological site LRU, ecological site number, and ecological site state FIPS code. For USFWS NWI polygons only, represents a concatenated code for VEGZONE, HGMCLASS, and HYDROSUBCL developed using available polygon information to identify an ecological site as described in the SDWAP.	NRCS SSURGO; USFWS NWI
ECOSITENAME	Name of ecological site for purposes of the SD WAP; name represents a concatenation of HGMCLASS and HYDROSUBCL	Developed for SD WAP
HGMCLASS	Hydrogeomorphic class as defined in Section 2.4.2	Developed for SD WAP using NRCS or USFWS polygon information
HYDROSUBCL	Hydrological subclasses as defined in Section 2.4.2	Developed for SD WAP using NRCS or USFWS polygon information
VEGZONE	Vegetation zone as defined in Section 2.4.2	Developed for SD WAP using NRCS or USFWS polygon information
WATREGZONE	Hydrology influencing a vegetation zone within an ecological site	Developed for SD WAP using NRCS or USFWS polygon information
SPECMODIFI	Indicates special modifications to a wetland (DIKE/IMP= diked or impounded, EXCAVATED, PART DRAIN/DITCH=partially drained/ditched, BEAVER, and FARMED).	USFWS NWI
UNIQ_POLY_	Identifies the number of polygons associated with a mapped ecological site by MLRA; first value represents MLRA and second represents a unique number applied to all polygons associated with an ecological site.	Developed by SD WAP
NWI_ATTRIB	Original USFWS NWI “ATTRIBUTE”	USFWS NWI

Identifying Land Use Impacts

Source GIS and tabular data:

1. SD WAP Riparian and Wetland Ecological Site Layer (ALL MLRAs RIPWET SDWAP.shp) – see previous section for a description of this layer

South Dakota Wildlife Action Plan

2. 2006 National Land Cover Database (Landsat-based, 30 meter resolution, landcover GIS file and database); <http://www.mrlc.gov/index.php>

Methods: Steps used to identify and quantify current land use impacts by ecological site and MLRA.

1. Evaluate options for quantifying land use impacts across South Dakota.
2. Acquire 2006 NLCD GIS layer and associated database.
3. Overlay NLCD GIS layer with SD WAP developed Riparian and Wetland Ecological site Layer.
4. Group land use codes into broader categories needed to meet objectives of SD WAP - see table C-2.

Native Ecosystem Plant Community

The same source information and methods as described for terrestrial systems.

Aquatic Systems

SD

Species of Greatest Conservation Need

Species Profiles

SD WAP Product: SGCN Profiles.xlsx and SGCN Citation List.xlsx

Source GIS and data:

1. SD Game, Fish and Parks species distribution GIS database

Methods: Steps used to develop profiles for species of greatest conservation needed

1. Current distribution maps developed by SD Game, Fish and Parks
2. All other species information gathered from published and online resources and listed in SGCN Citation List.xlsx.
3. Tables L-5 and L-6 identify and describe the fields associated with the resulting SGCN Profiles.xlsx and SGCN Citation List.xlsx tables.

South Dakota Wildlife Action Plan

Table L-5. Field name, description, and data sources used in the development of SGCN Profiles.xlsx.

<i>FIELD NAME</i>	<i>DESCRIPTION</i>	<i>DATA SOURCE</i>
SPP NUM	Unique number assigned to each species of greatest conservation need	Developed for SD WAP
Common Name	Common name generally associated with species in SD	SD Game, Fish and Parks
Scientific Name	Scientific name associated with species	SD Game, Fish and Parks
SPP Code	4 letter code associated with a species; derived from common name	SD Game, Fish and Parks
SPP GROUP	General	SD Game, Fish and Parks
FS	Federal protection status for a species	US Fish and Wildlife Service
SS	State protection status for a species	SD Game, Fish and Parks
2006 SGCN	Species included in 2006 WAP as a SGCN – yes or no	SD Game, Fish and Parks
2006 SC		SD Game, Fish and Parks
2012 SGCN	Species included in 2013 WAP as SGCN – yes or no	SD Game, Fish and Parks
2012 SC		SD Game, Fish and Parks
PHYS DESC	Physical description of species	Many sources by species
SD USE DESC	General habitat use of species in South Dakota	Developed from various information sources such as included in literature cited file for each species
Distribution	Distribution of species in South Dakota; historical and current	Historical information from best available source; current distribution based on South Dakota database of known recent sightings or evidence
KEY HAB DESC	Key habitat used by a species in South Dakota	Developed from various information sources such as included in literature cited file for each species
ECOSYSDIV LINK	Habitat distribution for a species as it relates to native ecosystem diversity of South Dakota	Developed based on best information available for preferred historical habitat of a species
Concerns - Hab	Habitat related conservation challenges facing a species in South Dakota	Developed from various information sources such as included in literature cited file for each species
Concerns – non-hab	Non-habitat related conservation challenges facing a species in South Dakota	Developed from various information sources such as included in literature cited file for each species
ACTIONS_hab	Habitat related conservation actions proposed for a species	Developed from various information sources such as included in literature cited file for each species
Action non-hab	Non-habitat related actions proposed for a species	Developed from various information sources such as included in literature cited file for each species
RECOV PLAN	Existing recovery plan or conservation plan? Yes or No	Citations are provided in species citation file

South Dakota Wildlife Action Plan

Table L-6. Field name, description, and data source associated with SGCN Citation List.xlsx.

<i>FIELD NAME</i>	<i>DESCRIPTION</i>	<i>DATA SOURCE</i>
SPP Code	4 letter code associated with a species; usually derived from the common name	SD Game, Fish and Parks
YR Reviewed	The year a publication was reviewed and added to WAP	Developed for SD WAP
CITATION	Citation for a publication	Various sources depending on species
Comments	Comments provided for a citation	Developed for SD WAP

South Dakota Wildlife Action Plan

Appendix M. Descriptions of Wildlife Action Plan web tools.

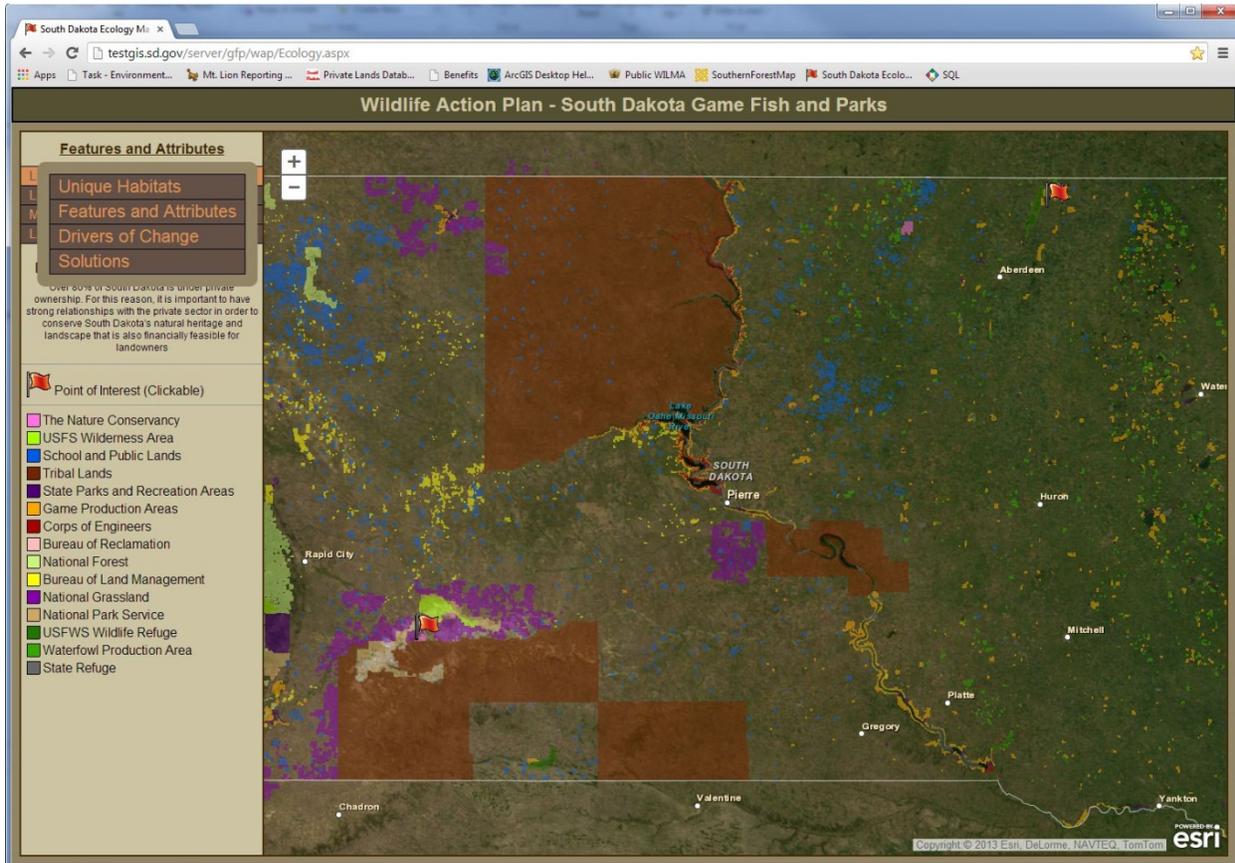
SDGFP has designed an easy-to-use interactive website that displays information from the Wildlife Action Plan and guides the user through various aspects of South Dakota landscapes, conservation challenges, and wildlife. The website was created during the Wildlife Action Plan Revision process, but the content will be dynamic as new information is created or found.

The first web tool is tentatively called South Dakota Lands and Waters. The four main themes are Unique Habitats, Features and Attributes, Drivers of Change, and Solutions. These themes are further divided into relevant topics that help tell the story of each theme. Points of interest are included with each topic to highlight interesting facts about South Dakota and provide more information about that particular topic.

The following screen shots illustrate various components of the South Dakota Wildlife, Land and Water tool, including land ownership, land composition, and a sample feature - grazing practices.

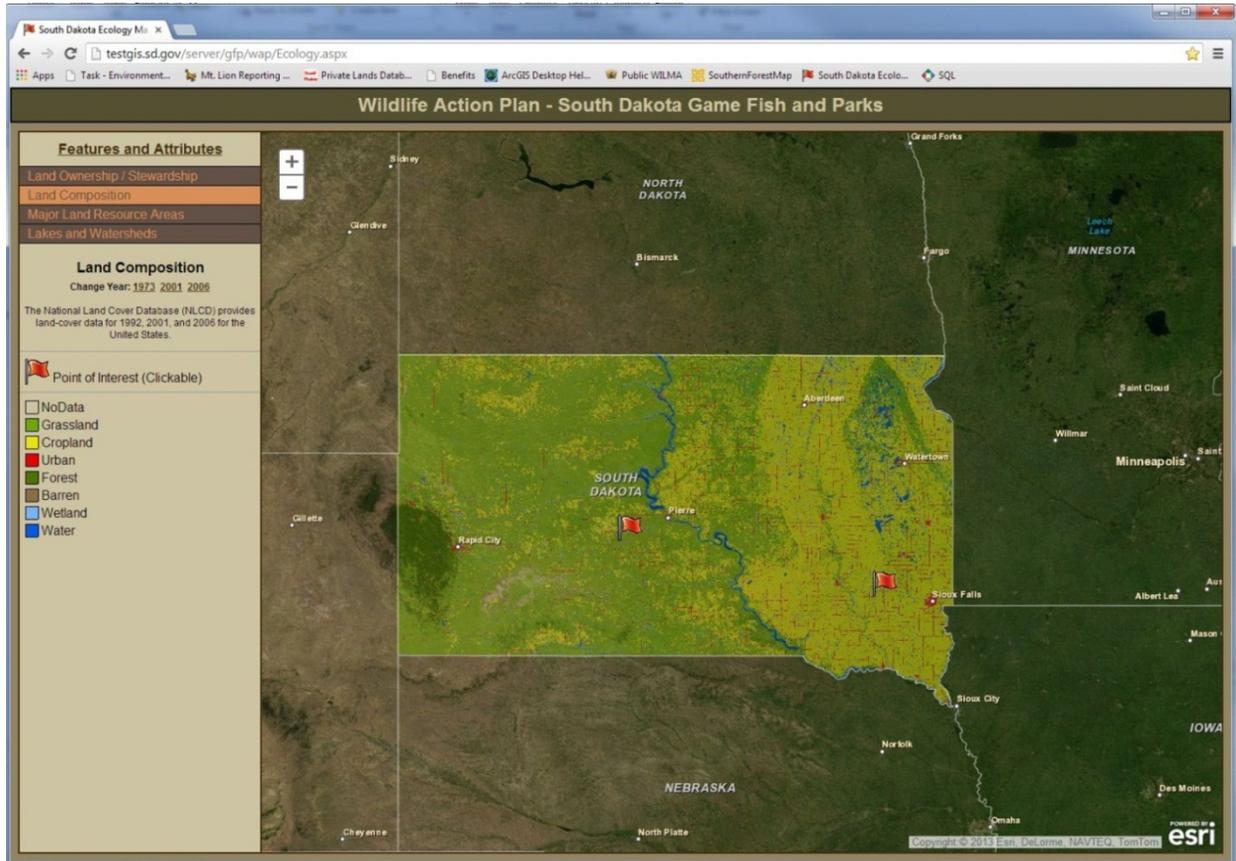
South Dakota Wildlife Action Plan

Appendix M (continued). Descriptions of Wildlife Action Plan web tools.



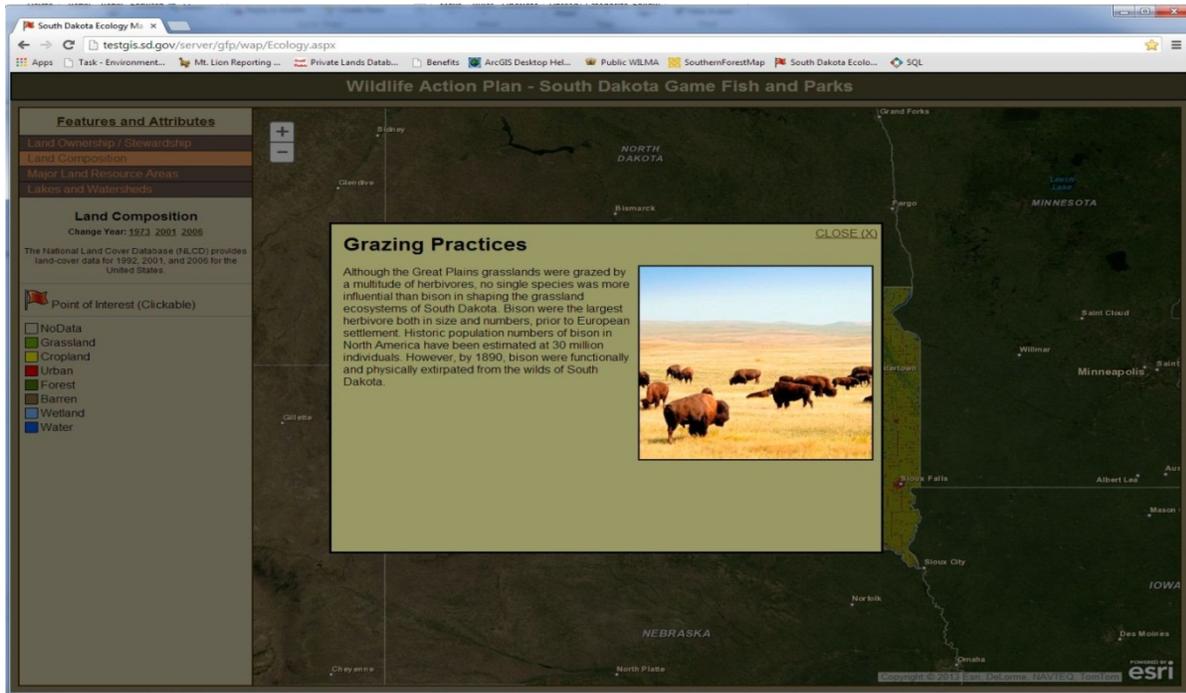
South Dakota Wildlife Action Plan

Appendix M (continued). Descriptions of Wildlife Action Plan web tools.



South Dakota Wildlife Action Plan

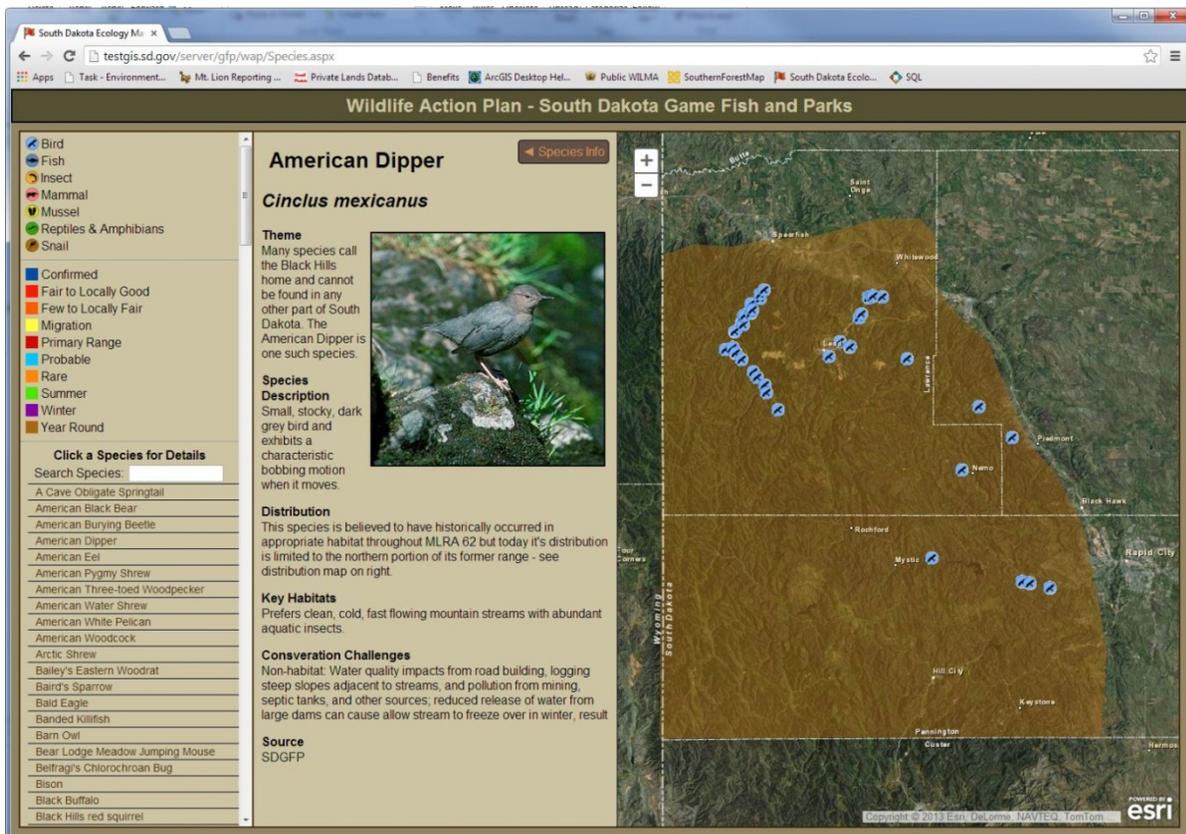
Appendix M (continued). Descriptions of Wildlife Action Plan web tools.



South Dakota Wildlife Action Plan

Appendix M (continued). Descriptions of Wildlife Action Plan web tools.

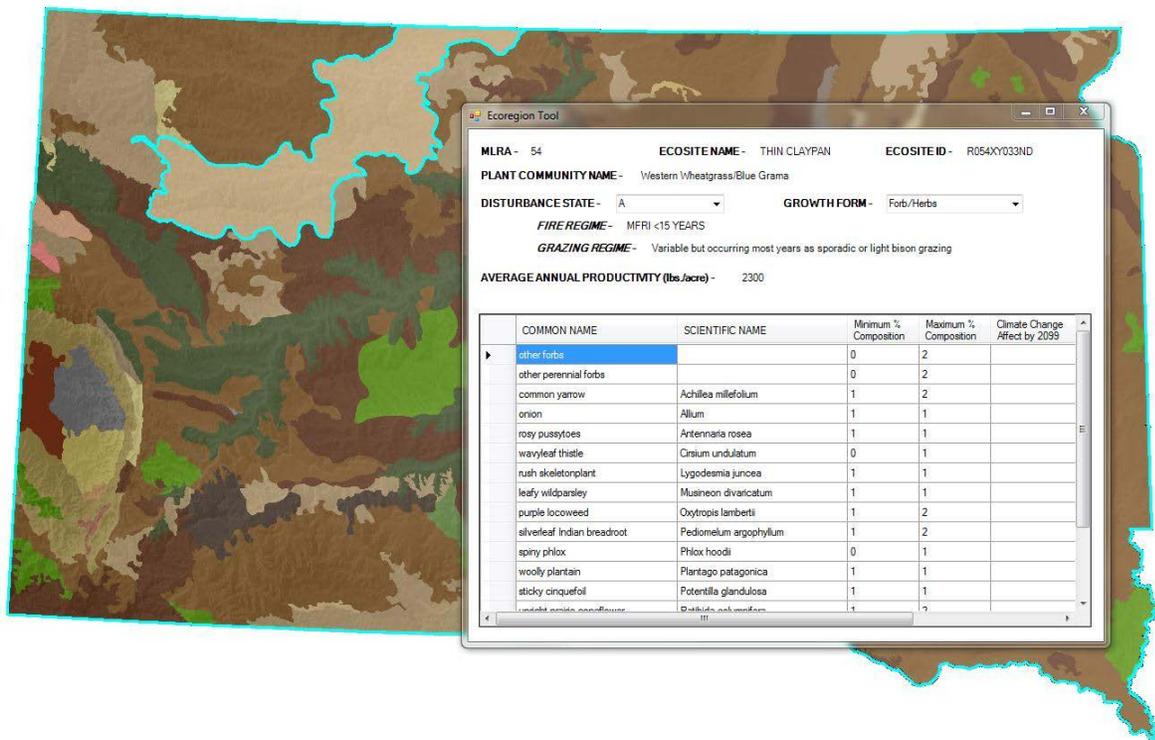
The Species web tool initially displays all animal species in South Dakota by common name. The user can click on the name for more information, which includes a brief species description, distribution, key habitats, and conservation challenges. A search function allows the user to find a particular species by filtering the list accordingly (e.g. Eagle). The screen shot below illustrates current content for the American dipper.



South Dakota Wildlife Action Plan

Appendix M (continued). Descriptions of Wildlife Action Plan web tools.

The Ecosite web tool allows the user to select an ecosite to determine the plant communities that could potentially exist within those boundaries. When the user selects a particular ecosite, the tool provides the Major Land Resource Area (MLRA) unit, the Ecosite name, and the Ecosite ID. Also listed are the dominant plant community for that ecosite, fire and grazing regime, and the average annual productivity in pounds per acre. The user can filter the results based on the disturbance state (i.e. A, B, C, or D) and the growth form (i.e. Forb/Herbs, Grasses & Grass-likes, and Shrubs). After the user selects an ecosite, the tool displays the common and scientific names of the plant community, minimum/maximum percent composition, and the climate change effect by 2099 (Grasses & Grass-likes only). The screen shot below provides an example of the ecosite web tool.



Appendix N. Past, Present, and Future Climates for South Dakota – Observed climatic variation from 1895-2010 and projected climate change to 2099. Authors Dr. Mark A. Cochrane and Christopher J. Moran (Executive Summary).

Planet Earth is warming, as shown by rising sea levels, falling levels of glacial and sea ice, and increasing temperatures within the lower atmosphere and surface waters of the world's oceans. In the last 30 years, global temperatures have risen by roughly 0.6°C (1.0°F) concurrently with increases in the atmospheric concentrations of several known greenhouse gases (GHGs). Changes in average weather patterns that are maintained over long periods are what define climate change. Global climate changes do not proceed equally in all regions or at an average rate through time. Local climate changes will play a large role in shaping ecosystems by providing selection pressure for species or geno- and phenotypes that can thrive under a region's new conditions. We present here an analysis based upon observed climate changes since 1895 and a 16 Global Climate Model-ensemble depicting projected climate changes for low and high GHG emission scenarios between now and the end of this century, for each of the 19 Major Land Resource Areas (MLRAs) in the state of South Dakota.

Since the climate normals (1961-1990) were established for the existing Major Land Resource Areas (MLRAs), average temperatures have increased between 0.1°C and 0.5°C, and average precipitation has varied from a 0.5% decrease to a 14.9% increase in individual MRLAs for the most recent climate normals (1981-2010).

Downscaled global climate models project a continuation of observed trajectories with increases in both average temperature and precipitation. However, average precipitation is, for the most part, projected to stay within the range of variability observed since 1895, while average temperatures will push beyond historical ranges.

For individual MRLAs in the 2021-2050 climatic period, an increase in average temperature of between 1.6 – 1.8°C and 1.5 – 1.6°C is expected for the A2 and B1 greenhouse gas emission scenarios, respectively, with disproportionate warming in the summer (June, July, August) months of up to 2°C. Average precipitation will increase from 3.9 – 7.8% and 4.5 – 7.2% for the A2 and B1 greenhouse gas emission scenarios, respectively, with the greatest increases predicted in the spring (March, April, May) months of up to 12.9%.

For individual MRLAs in the 2070-2099 climatic period, an increase in average temperature of between 4.3 – 4.6°C and 2.7 – 2.9°C is expected for the A2 and B1 greenhouse gas emission scenarios, respectively, with disproportionate warming in the summer months of up to 5.2°C. Average precipitation will increase from 10.3 – 17.7% and 7.5 – 9.3% for the A2 and B1 greenhouse gas emission scenarios, respectively, with the greatest increases predicted in the spring months of up to 31.2%.

Appendix O. Climate Change Vulnerability Assessment of Aquatic Species of Greatest Conservation Need in South Dakota. Author Dr. Andrew Burgess (Executive Summary).

As part of the revision of the South Dakota Comprehensive Wildlife Conservation Plan, also known as the South Dakota Wildlife Action Plan, the South Dakota Department of Game, Fish and Parks chose to consider the impacts of projected climate change on aquatic species of greatest conservation need. This analysis was contracted to a former aquatic biologist with the agency. The primary tool used in this analysis was NatureServe's Climate Change Vulnerability Index (CCVI), which measures vulnerability to climate change based on exposure to projected future changes in temperature, precipitation, and moisture across a species' range and the species' sensitivity to potential changes based on certain physiological, genetic, and life history variables. The tool does not consider species status rankings, which should be evaluated in combination with the CCVI tool.

Twenty fish species of greatest conservation need were assessed; 14 were found vulnerable to the impacts of future climate change. Eight species were found highly or extremely vulnerable. Six of these species are considered disjunct species in the state because they depend on restricted habitat conditions in isolated areas (Longnose Sucker, Mountain Sucker, and Lake Chub) or because they are glacial relicts (Northern Redbelly Dace, Northern Pearl Dace, and Finescale Dace). Missouri River endemic species, such as Pallid Sturgeon, Sicklefin Chub, and Sturgeon Chub, are also vulnerable to future climate change.

Nine freshwater mussel species were assessed; 4 were found vulnerable to the impacts of future climate change. Two species, Higgins eye and elktoe, were found highly vulnerable. Four aquatic insects that are included on the species of greatest conservation need list were not analyzed due to a lack of necessary specific information.

This analysis is considered a starting point for the assessment of climate change impacts on aquatic species of greatest conservation need in South Dakota, representing only one potential limiting factor to aquatic species. The tool's predictive capability is expected to improve with consideration of additional data. Resource managers will also benefit from a better understanding of climate change impacts at a broader habitat scale, which is beyond the scope of this initial analysis.

South Dakota Wildlife Action Plan

Appendix P. List of conservation initiatives in South Dakota, as of 2013.

Lead Entity	Initiative title	Purpose/target	Key cooperators	Geographic level	Website address
Multispecies, habitat- or landscape-based efforts					
USFWS	Northern Great Plains Joint Venture	Maintaining and protecting existing wetlands and grasslands and creating and enhancing wetlands		Southeastern MT, southwestern ND, western SD, and northeastern WY	
USFWS	Prairie Potholes Joint Venture	“The mission of the Prairie Pothole Joint Venture is to implement conservation programs that sustain populations of waterfowl, shorebirds, other waterbirds and prairie landbirds at objective levels through targeted wetland and grassland protection, restoration and enhancement programs. These activities will be based on science and implemented in collaboration with multiple stakeholders.”	Hierarchy includes cooperator, management board, HAPET offices, and standing committees composed of agencies and NGOs	Northern MT, northern and southeastern ND, eastern SD, western MN, northwestern IA	http://www.ppjv.org/
USFWS	Plains and Prairie Potholes Landscape Conservation Cooperative			Prairie Pothole Region, Northern Great Plains and the riparian corridors of several major river systems including the Missouri, the Yellowstone and the Red River	http://www.plainsandprairiepotholeslcc.org/ http://www.plainsandprairiepotholeslcc.org/wp-content/uploads/2012/04/PrairiePotholesLCC_water_noframe.pdf
USFWS	Dakota Grassland	“to accelerate the conservation of wetland and grassland	USFWS, state wildlife agencies with	Prairie Pothole Region	http://www.fws.gov/audubon/grasslan

South Dakota Wildlife Action Plan

	Conservation Area	habitat, within the Prairie Pothole Region in the eastern portions of North Dakota, South Dakota, and Montana.”	complementary goals		ds/dgca_lpp_fact_sheet_web.pdf
USFWS	NAWCA grants	“The North American Wetlands Conservation Act (Act, or NAWCA) of 1989 provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico for the benefit of wetlands-associated migratory birds and other wildlife.”		continentwide	http://www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm
USFWS	National Fish Habitat Partnership/ National Fish Habitat Action Plan Great Plains Fish Habitat Partnership	“The mission of the National Fish Habitat Action Plan is to protect, restore and enhance the nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the American people.”		U.S. states and territories	http://fishhabitat.org/ http://www.prairiefish.org/ http://fishhabitat.org/content/national-fish-habitat-action-plan-2nd-edition-2012 (Action plan, 2 nd edition)
USFWS	100 th Meridian Initiative	“ a cooperative effort between local, state, provincial, regional and federal agencies to prevent the westward spread of zebra/quagga mussels and other aquatic nuisance species in North America”		Missouri River Basin	http://www.100thmeridian.org/

South Dakota Wildlife Action Plan

SDGFP	Coordinated restoration of native grasslands using innovative practices	restore native grasslands in SD and Nebraska	Nebraska Game and Parks Commission; EMRI	South Dakota and Nebraska	
SDGFP	Multistate conservation of species of greatest conservation need in the Keya Paha Watershed	enhance populations of SGCN identified in Wildlife Action Plans of SD and Nebraska	Nebraska Game and Parks Commission	Keya Paha watershed of SD and Nebraska	
SDGFP	South Dakota All Bird Conservation Plan	identify the priority species of concern in South Dakota, present their habitat requirements, and identify possible habitat management options.	tribes, other agencies, birding community, and the general public	South Dakota	http://gfp.sd.gov/wildlife/docs/bird-plan.pdf
SDGFP	South Dakota Bat Management Plan	protect bats and bat habitat through action, education, and cooperation with federal, state, and private landowners	South Dakota Bat Working Group, tribes, other agencies, and the general public	South Dakota	http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx
NRCS	Wetland Reserve Program Grassland Reserve Program	Wetlands Reserve Program was a voluntary program that offered landowners the opportunity to protect, restore, and enhance wetlands on their property. Grassland Reserve Program was a voluntary conservation program that emphasized support for working grazing operations, enhancement of plant and animal biodiversity, and protection of grassland			http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/

South Dakota Wildlife Action Plan

		under threat of conversion to other uses			
SD Dept. of Environment and Natural Resources	319 Non-point Source Pollution Projects	restore water bodies		South Dakota	http://water.epa.gov/polwaste/nps/success319/ only 3 SD examples are featured http://denr.sd.gov/dfta/wp/maps/319projectmap.pdf 319 project status map as of Feb. 2012
SD Dept. of Transportation	Scenic Byways	5 designated in SD: <ul style="list-style-type: none"> • Native American Scenic Byway • Peter Norbeck Scenic Byway • Badlands Loop Scenic Byway • Spearfish Canyon Scenic Byway • Wildlife Loop Road Scenic Byway 			http://byways.org/explore/states/SD
SD Dept. of Agriculture	Coordinated Natural Resources Conservation Grants	Limited competitive funding for projects that show a natural resource conservation benefit to the state.	Conservation districts eligible		http://sdda.sd.gov/grants/
Bureau of Land Management	National Landscape Conservation System				none in South Dakota
National Park Service	Badlands Wilderness Area	"...to secure for the American people of present and future generations the benefits of an enduring resource of			http://www.wilderness.net/map.cfm

South Dakota Wildlife Action Plan

		wilderness"			
U.S. Forest Service	Black Elk Wilderness Areas				
U.S. Forest Service	Forest Legacy Program				http://www.fs.fed.us/spf/coop/programs/loa/flp_projects.shtml No acreage listed for SD
U.S. Forest Service, Nebraska National Forest	Land and Resource Management Plan, Nebraska National Forest			Nebraska National Forest	http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_027883.pdf (LRMP plan, including map link)
U.S. Forest Service, Dakota Prairie Grassland	Final EIS Dakota Prairie Plan			Grand River National Grassland (Perkins and Corson counties)	http://www.fs.usda.gov/detailfull/dpg/landmanagement/?cid=stelprdb5340280&width=full
U.S. Forest Service, Custer National Forest				Harding County; in addition to North and South Cave Hills and Short Pines, there are 2 National Natural Landmarks - Castles and Capitol Rock	http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346049.pdf (link to Sioux Ranger District map) http://www.fs.usda.gov/resources/custer/landmanagement/resourcemanagement http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5353157.pdf (motor vehicle use map)

South Dakota Wildlife Action Plan

North American Grouse Partnership	Prairie Grouse Partners	Restore 20% of North America's native grasslands	Pheasants Forever, Quail Forever, Theodore Roosevelt Conservation Partnership, and Mule Deer Foundation	North America	http://grousepartners.org/
Ducks Unlimited	Grasslands for Tomorrow	Perpetual protection of 2,000,000 acres of native prairie		Prairie Pothole Region	http://www.ducks.org/conservation/where-we-work/prairie-pothole-region/grasslands-for-tomorrow
National Wild Turkey Federation	Northern Great Plains Riparian Initiative	Enhance Riparian Habitat	BASF, Miller Brewing Co., OK DOWC	MT, SD, ND, WY	http://www.nwtf.org/conservation/regional_habitat_programs.html
National Audubon Society	Important Bird Areas	"identify and conserve areas that are vital to birds and other biodiversity"	Audubon chapters		http://web4.audubon.org/bird/iba/ None identified in SD; project recently begun.
American Bird Conservancy	Top 20 Most Threatened Bird Habitats in the U.S.			U.S.	http://www.abcbirds.org/newsandreports/special_reports/habitatreport.pdf
The Nature Conservancy	"The Status of Biodiversity in the Great Plains: Great Plains Landscapes of Biological Significance" Aldrich, J.M., W.R. Ostlie, and T.M. Faust. 1997. The Nature Conservancy,	ecoregional planning document that does not contain maps			http://conserveonline.org/library/great_plains_landscapes_97.pdf/view.html Identified areas: <ul style="list-style-type: none">• Black Hills (SD, WY)• Keya Paha River (NE, SD)• Little Missouri River (MT, ND, SD, WY)• Middle Missouri River (ND, SD, NE)• Nebraska Sandhills (NE, SD)

South Dakota Wildlife Action Plan

	Minneapolis, MN.				<ul style="list-style-type: none"> • Pine Ridge (NE, SD) • Prairie Coteau (MN, SD) • Sisseton Escarpment (MN, SD) • South Dakota Badlands (SD) • Southern Missouri Coteau (ND, SD) • Upper Minnesota River (MN, SD)
The Nature Conservancy	<p>“Ecoregional Planning in the Northern Tallgrass Prairie”</p> <p>Northern Tallgrass Prairie Ecoregional Planning Team. 1998.</p>			northern tallgrass prairie ecoregion (portions of Manitoba, ND, SD, MN and IA)	<p>http://east.tnc.org/east-file/35/ntp-final-plan.pdf</p> <p>Figure 8 (Portfolio Design), p. 37</p> <p>Figure 15 (Conservation Priorities), p. 55</p> <p>Appendix 2 (Primary Target Species), p. 85</p>
The Nature Conservancy	<p>“Ecoregional Planning in the Northern Great Plains Steppe”</p> <p>Northern Great Plains Steppe Ecoregional Conservation Team. 1999.</p>				<p>http://east.tnc.org/east-file/26/ngps_final_feb99.pdf</p> <p>Black Hills excluded from this plan</p> <p>Appendix 1 (Primary Target Species), p. 58</p>
The Nature Conservancy	<p>“Ecoregional Conservation in the Black Hills”</p> <p>Hall, J.S., H.J. Marriott, and J.K. Perot. 2002. The Nature Conservancy,</p>				<p>http://conserveonline.org/library/bhills_final_apr02pdf.pdf/view.html</p> <p>Figure 5 (Portfolio sites), p. 27</p> <p>Appendix 3 (Animal Target Information), p. 77</p>

South Dakota Wildlife Action Plan

	Minneapolis, MN.				
Western Governors Association	Critical Habitat Assessment Tool	"...to bring greater certainty and predictability to planning efforts by establishing a common starting point for discussing the intersection of development and wildlife"			http://www.westgovchat.org/
Partners in Flight	<p>Bird Conservation Regions 11 and 17</p> <p>Physiographic Areas 37 and 38</p> <ul style="list-style-type: none"> • Partners in Flight Bird Conservation Plan for The Northern Mixed-grass Prairie (Physiographic Area 37) • West River (Physiographic Area 38) – plan not completed 				<p>http://www.partnersinflight.org/</p> <p>http://www.partnersinflight.org/bcps/plan/pl_37_10.pdf</p> <p>http://www.partnersinflight.org/bcps/pl_38sum.htm</p>
Association of Fish and Wildlife Agencies	Southern Wings	international effort to conserve state-priority migratory bird species on wintering grounds	participating state agencies (including SDGFP), American Bird Conservancy, National Audubon Society, Ducks Unlimited, The Nature Conservancy, Pronatura	Latin America	http://www.fishwildlife.org/index.php?section=southern-wings-program&activator=62
PARC (Partners in Amphibian and Reptile)	PARCA (Priority Amphibian and Reptile)	identify and designate PARCAs in each state using a system informed by scientific criteria	PARC, regional PARC chapters, state wildlife agencies and other	U.S.	http://www.parcplace.org/publications/parcas-priority-amphibian-and-reptile-

South Dakota Wildlife Action Plan

Conservation)	Conservation Area) System	and expert review	cooperators		conservation-areas.html (South Dakota’s participation will depend on acquisition and analysis of suitable habitat data.)
25 organizations	Northern Plains Conservation Network (NPCN)	“Ours is a vision for the future of the heartland of North America, a vision of a sea of grass supporting healthy wildlife populations and vibrant communities of people.”	Alberta Wilderness Association, American Bison Society, Badlands Conservation Alliance, Biodiversity Conservation Alliance, Defenders of Wildlife, Environmental Defense Fund, FaunaWest Wildlife Consultants, Great Plains Restoration Council, Lower Brule Sioux Tribe Department of Wildlife, Fish and Recreation, Montana Big Open, Montana Wilderness Association, National Audubon Society, National Wildlife Federation, Nature Canada, Oglala Sioux Parks and Recreation Authority, Prairie Hills Audubon Society of Western South Dakota Inc., Prairie Wildlife Research, Sacred Ground International, Sierra Club, Society of Grasslands Naturalists,	Northern Great Plains of U.S. and Canada	http://www.npcn.net/ http://www.protectedareas.info/upload/document/ecoregionplan-northerngreatplainconservationassessmentssummary.pdf (Second link is for Ocean of Grass Assessment by Forrest et al. 2004)

South Dakota Wildlife Action Plan

			Southern Plains Land Trust, Temperate Grasslands Conservation Initiative, Wildlife Conservation Society, World Wildlife Fund, Yellowstone Buffalo Foundation		
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South Dakota Wildlife Action Plan

Appendix P (continued). List of conservation initiatives in South Dakota, as of 2013.

Lead Entity	Initiative title	Purpose/target	Key cooperators	Geographic level	Website address
Species-specific efforts					
USFWS	Pallid Sturgeon Recovery Plan	promote recovery of pallid sturgeon	state and tribal wildlife agencies within the Missouri River basin	Missouri River (2 recovery priority management areas in SD)	http://www.fws.gov/yellowstonerivercoordinator/pallid%20recovery%20plan.pdf
USFWS	Piping Plover critical habitat	identify areas that provide important habitats for piping plover		Missouri River (2 units in SD)	http://www.fws.gov/mountain-prairie/species/birds/pipingplover/
USFWS	Greater Sage-Grouse (<i>Centrocercus urophasianus</i>) Conservation Objectives: Final Report	“The U.S. Fish and Wildlife Service (Service) is making available a final report that is designed to help guide the efforts of the States and other partners to conserve the greater sage-grouse with a landscape level strategy. The report, prepared by state and federal scientists and sage-grouse experts, identifies the conservation status of the sage-grouse, the nature of the threats facing the species, and objectives to ensure its long-term conservation.”		range of the greater sage-grouse	http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/COT/COT-Report-with-Dear-Interested-Reader-Letter.pdf
USFWS	Black-footed Ferret Draft Recovery Plan – Second Revisions,	to recover the black-footed ferret such that it no longer meets the ESA’s definition of endangered or threatened and	participating state, federal and tribal agencies, private landowners, private	range of the black-footed ferret	http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/2013DraftRevisedRecoveryPlan.pdf

South Dakota Wildlife Action Plan

	February 2013	can be removed from the Federal List of Endangered and Threatened Wildlife (i.e., delisted).	organizations, the general public		
USFWS	American Burying Beetle (<i>Nicrophorus americanus</i>) Recovery Plan	interim objective is to reduce the immediacy of the threat of extinction to the American burying beetle, and the longer range objective is to improve its status so that it can be reclassified from endangered to threatened	participating state, federal and tribal agencies, private landowners, private organizations, the general public	range of the American burying beetle	http://www.fws.gov/southdakotafieldoffice/abbrecoveryplan.pdf
USFWS	Higgins Eye Pearlymussel (<i>Lampsilis higginsii</i>) Recovery Plan: First Revision	<ul style="list-style-type: none"> recovery of Higgins eye to levels where its protection under the Act is no longer necessary and it may be removed from the Federal list of Endangered and Threatened Wildlife (50 CFR 17.11) plan also contains an intermediate goal of reclassifying the species from Endangered to Threatened. 	USACE, Minnesota Dept. of Natural Resources, Wisconsin Dept. of Natural Resources, Macalester College, University of Minnesota, Western Wisconsin Technical College	range of the Higgins eye	http://www.fws.gov/midwest/mussel/documents/higgins_eye_recovery_plan_first_revision.pdf
USFWS	Topeka shiner (<i>Notropis Topeka</i>) 5-Year Review: Summary and Evaluation	summarize state of knowledge on research, population trends, present and future threats, and conservation actions	cooperating state, federal and tribal agencies, the general public	range of the Topeka shiner	http://www.fws.gov/mountain-prairie/species/fish/shiner/TopekaShiner5YearReview01222010Final.pdf
USFWS and Canadian Wildlife Service	International Recovery Plan Whooping Crane (<i>Grus americana</i>) –	establish multiple self-sustaining populations of whooping cranes in the wild in North America, allowing initially for reclassification to	participating state, federal and tribal agencies, private landowners, private organizations, the	range of the whooping crane	http://www.fws.gov/southwest/es/Documents/R2ES/Whooping_Crane_Recovery_Plan_FINAL_21-July-2006.pdf

South Dakota Wildlife Action Plan

	Third Revision	threatened status and, ultimately, removal from the List of Threatened and Endangered Species (delisting)	general public		
Natural Resources Conservation Service	Sage Grouse Initiative	Enhance Sage Grouse Habitat		Western U.S.	http://www.sd.nrcs.usda.gov/programs/EQIP_SGI_2012.html
U.S. Army Corps of Engineers	Missouri River Recovery Management Plan	develop conceptual ecological models and species objectives for piping plover, least tern, and pallid sturgeon and	U.S. Fish and Wildlife Service; state and tribal wildlife agencies along the Missouri River	Missouri River Basin	http://moriverrecovery.usace.army.mil/mrrp/f?p=136:70:0
Interstate Black-tailed Prairie Dog Conservation Team	A Multi-State Conservation Plan for the Black-tailed Prairie Dog, <i>Cynomys ludovicianus</i> , in the United States	to provide guidelines under which management plans will be developed by individual states and their respective working groups	USFWS, state and tribal wildlife agencies, private organizations, and the general public	range of the black-tailed prairie dog	http://www.azgfd.gov/w_c/nongameandendangeredwildlifeprogram/documents/080623_BTPD_Multi-StateConservationPlan_Final.pdf
SDGFP	South Dakota River Otter Management Plan	provide general, strategic guidance for 5 years to the South Dakota Game, Fish and Parks Department (SDGFP) and potential partners for the recovery and sustained management of the river otter in South Dakota	tribes, other agencies, trappers, and the general public	South Dakota	http://gfp.sd.gov/wildlife/management/plans/docs/OtterPlan2012.pdf
SDGFP	Prairie Grouse Management Plan for South Dakota (2011 – 2015)	maintain prairie grouse populations and habitat consistent with the ecological, social, and aesthetic values of SD citizens while addressing the concerns and issues of	tribes, other agencies, hunters, and the general public	South Dakota	http://gfp.sd.gov/wildlife/management/plans/docs/PrairieGrouseManagementPlan.pdf

South Dakota Wildlife Action Plan

		residents and visitors of SD			
SDGFP	South Dakota Aquatic Nuisance Species Management Plan	<ul style="list-style-type: none"> Prevent new introductions of ANS to South Dakota. Educate all aquatic users of ANS risks and how to reduce the harmful impacts. Prevent dispersal of established populations of ANS into uninfested waters in South Dakota. Eradicate or control ANS to minimize the adverse ecological, economic, social, and public health effects of ANS in an environmentally sound manner. Support research on ANS in South Dakota, and develop systems to disseminate information. 	tribes, other agencies, anglers and river recreationists, and the general public	South Dakota	http://gfp.sd.gov/wildlife/docs/SDANS-final-draft-management-plan.pdf
SDGFP	Topeka Shiner State Management Plan	<ul style="list-style-type: none"> Maintain habitat integrity in Topeka shiner streams Establish a point-based management goal for the State of South Dakota in contribution towards national recovery efforts 	USFWS, NRCS, USACE, SD DENR , SD DOT, SD Dept. of Agriculture, conservation districts, state universities, and private organizations (SD Cattlemen’s Assoc., SD Farm Bureau)	eastern South Dakota	http://gfp.sd.gov/wildlife/management/plans/topeka-shiner-plan.aspx
SDGFP	South Dakota Black-tailed Prairie Dog Conservation and Management Plan	manage for long-term, self-sustaining prairie dog populations in South Dakota while addressing landowner concerns and maintaining the viability of this unique	SD Dept. of Agriculture	South Dakota	http://gfp.sd.gov/wildlife/docs/Prairiedog-management-plan.pdf

South Dakota Wildlife Action Plan

		grassland ecosystem			
SDGFP	South Dakota Pallid Sturgeon (<i>Scaphirhynchus albus</i>) Management Plan	to ensure that South Dakota's activities on lands transferred from federal government to SDGFP have an overall net benefit on the pallid sturgeon and to promote management of the Missouri River system so that conditions are suitable for pallid spawning, fry survival and recruitment	USFWS, NPS, USACE, Nebraska Game and Parks Commission, SDSU, SD DENR, Yankton Sioux Tribe	Missouri River in South Dakota	http://gfp.sd.gov/wildlife/management/plans/docs/FinalPallidPlan.pdf
SDGFP	South Dakota Interior Least Tern (<i>Sterna antillarum athalassos</i>) and Piping Plover (<i>Charadrius melodus</i>) Management Plan	identify goals for interior least tern and piping plover to assist in meeting rangewide recovery	USFWS, NPS, USACE, Nebraska Game and Parks Commission, Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Lower Brule Tribe, Cheyenne River Sioux Tribe, Yankton Sioux Tribe	South Dakota	http://gfp.sd.gov/wildlife/docs/least-tern-piping-plover-plan.pdf
SDGFP	South Dakota Bald Eagle (<i>Haliaeetus leucocephalus</i>) Management Plan	identify long-term goals for bald eagles in South Dakota to ensure their long-term survival	USFWS, NPS, USACE, Nebraska Game and Parks Commission, Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Sioux Tribe, Oglala Sioux Tribe, Cheyenne River Sioux Tribe, Yankton Sioux Tribe	South Dakota	http://gfp.sd.gov/wildlife/docs/bald-eagle-plan.pdf
SDGFP	Greater Sage-Grouse Management Plan,	manage greater sage- grouse and associated habitats in South Dakota for their	tribes, other agencies, and the general public	South Dakota	http://gfp.sd.gov/wildlife/docs/sage-grouse-management-plan.pdf

South Dakota Wildlife Action Plan

	South Dakota, 2008 – 2017	sustained and equitable use, and for the benefit, welfare, and enjoyment of the citizens of this stat and its visitors			
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South Dakota Wildlife Action Plan

Appendix Q. Separation distances used in developing terrestrial conservation opportunity area species richness data layer.

Species Common Name	Scientific Name	Separation Distance (km)
Amphibians		
American Toad	<i>Anaxyrus americanus</i>	5
Blanchard's Cricket Frog	<i>Acris blanchardi</i>	5
Boreal Chorus Frog	<i>Pseudacris maculata</i>	5
Bull Frog	<i>Lithobates catesbeianus</i>	5
Canadian Toad	<i>Anaxyrus hemiophrys</i>	5
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	5
Eastern Gray Treefrog	<i>Hyla versicolor</i>	5
Great Plains Toad	<i>Anaxyrus cognatus</i>	5
Mudpuppy	<i>Necturus maculosus</i>	10
Northern Cricket Frog	<i>Acris crepitans</i>	5
Northern Leopard Frog	<i>Lithobates pipiens</i>	5
Plains Leopard Frog	<i>Lithobates blairi</i>	5
Plains Spadefoot	<i>Spea bombifrons</i>	5
Tiger Salamander	<i>Ambystoma tigrinum</i>	3
Wood Frog	<i>Lithobates sylvaticus</i>	5
Woodhouse's Toad	<i>Anaxyrus woodhousii</i>	5
Birds		
American Avocet	<i>Recurvirostra americana</i>	5
American Bittern	<i>Botaurus lentiginosus</i>	10
American Black Duck	<i>Anas rubripes</i>	10
American Coot	<i>Fulica americana</i>	10
American Crow	<i>Corvus brachyrhynchos</i>	5
American Dipper	<i>Cinclus mexicanus</i>	5
American Goldfinch	<i>Spinus tristis</i>	5
American Kestrel	<i>Falco sparverius</i>	10
American Redstart	<i>Setophaga ruticilla</i>	5
American Robin	<i>Turdus migratorius</i>	5
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	5
American White Pelican	<i>Pelecanus erythrorhynchos</i>	10
American Wigeon	<i>Anas americana</i>	10
American Woodcock	<i>Scolopax minor</i>	5
Baird's Sparrow	<i>Ammodramus bairdii</i>	5
Bald Eagle	<i>Haliaeetus leucocephalus</i>	10
Baltimore Oriole	<i>Icterus galbula</i>	5
Bank Swallow	<i>Riparia riparia</i>	5
Barn Owl	<i>Tyto alba</i>	10
Barn Swallow	<i>Hirundo rustica</i>	5
Barred Owl	<i>Strix varia</i>	10

South Dakota Wildlife Action Plan

Bell's Vireo	<i>Vireo bellii</i>	5
Belted Kingfisher	<i>Megaceryle alcyon</i>	10
Black Tern	<i>Chlidonias niger</i>	5
Black-and-white Warbler	<i>Mniotilta varia</i>	5
Black-backed Woodpecker	<i>Picoides arcticus</i>	5
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	5
Black-billed Magpie	<i>Pica hudsonia</i>	5
Black-capped Chickadee	<i>Poecile atricapillus</i>	5
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	10
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	5
Black-necked Stilt	<i>Himantopus mexicanus</i>	5
Blue Grosbeak	<i>Passerina caerulea</i>	5
Blue Jay	<i>Cyanocitta cristata</i>	5
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	5
Blue-winged Teal	<i>Anas discors</i>	10
Blue-winged Warbler	<i>Vermivora cyanoptera</i>	5
Bobolink	<i>Dolichonyx oryzivorus</i>	5
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	5
Brewer's Sparrow	<i>Spizella breweri</i>	5
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	5
Broad-winged Hawk	<i>Buteo platypterus</i>	10
Brown Creeper	<i>Certhia americana</i>	5
Brown Thrasher	<i>Toxostoma rufum</i>	5
Brown-headed Cowbird	<i>Molothrus ater</i>	5
Bufflehead	<i>Bucephala albeola</i>	10
Bullock's Oriole	<i>Icterus bullockii</i>	5
Burrowing Owl	<i>Athene cunicularia</i>	5
California Gull	<i>Larus californicus</i>	5
Canada Goose	<i>Branta canadensis</i>	10
Canvasback	<i>Aythya valisineria</i>	10
Canyon Wren	<i>Catherpes mexicanus</i>	5
Caspian Tern	<i>Hydroprogne caspia</i>	5
Cassin's Finch	<i>Haemorhous cassinii</i>	5
Cassin's Kingbird	<i>Tyrannus vociferans</i>	5
Cassin's Sparrow	<i>Peucaea cassinii</i>	5
Cattle Egret	<i>Bubulcus ibis</i>	10
Cedar Waxwing	<i>Bombycilla cedrorum</i>	5
Cerulean Warbler	<i>Setophaga cerulea</i>	5
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	5
Chimney Swift	<i>Chaetura pelagica</i>	5
Chipping Sparrow	<i>Spizella passerina</i>	5
Chuck-will's-widow	<i>Antrostomus carolinensis</i>	5
Cinnamon Teal	<i>Anas cyanoptera</i>	10
Clark's Grebe	<i>Aechmophorus clarkii</i>	10
Clark's Nutcracker	<i>Nucifraga columbiana</i>	5

South Dakota Wildlife Action Plan

Clay-colored Sparrow	<i>Spizella pallida</i>	5
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	5
Common Grackle	<i>Quiscalus quiscula</i>	5
Common Loon	<i>Gavia immer</i>	10
Common Merganser	<i>Mergus merganser</i>	10
Common Nighthawk	<i>Chordeiles minor</i>	5
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	5
Common Tern	<i>Sterna hirundo</i>	5
Common Yellowthroat	<i>Geothlypis trichas</i>	5
Cooper's Hawk	<i>Accipiter cooperii</i>	10
Cordilleran Flycatcher	<i>Empidonax occidentalis</i>	5
Dickcissel	<i>Spiza americana</i>	5
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	10
Downy Woodpecker	<i>Picoides pubescens</i>	5
Dusky Flycatcher	<i>Empidonax oberholseri</i>	5
Eared Grebe	<i>Podiceps nigricollis</i>	10
Eastern Bluebird	<i>Sialia sialis</i>	5
Eastern Kingbird	<i>Tyrannus tyrannus</i>	5
Eastern Meadowlark	<i>Sturnella magna</i>	5
Eastern Phoebe	<i>Sayornis phoebe</i>	5
Eastern Screech-owl	<i>Megascops asio</i>	5
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	5
Eastern Wood-pewee	<i>Contopus virens</i>	5
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	10
European Starling	<i>Sturnus vulgaris</i>	5
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	5
Ferruginous Hawk	<i>Buteo regalis</i>	10
Field Sparrow	<i>Spizella pusilla</i>	5
Flammulated Owl	<i>Otus flammeolus</i>	5
Forster's Tern	<i>Sterna forsteri</i>	5
Franklin's Gull	<i>Leucophaeus pipixcan</i>	5
Gadwall	<i>Anas strepera</i>	10
Glossy Ibis	<i>Plegadis falcinellus</i>	10
Golden Eagle	<i>Aquila chrysaetos</i>	20
Golden-crowned Kinglet	<i>Regulus satrapa</i>	5
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	5
Gray Catbird	<i>Dumetella carolinensis</i>	5
Gray Jay	<i>Perisoreus canadensis</i>	5
Gray Partridge	<i>Perdix perdix</i>	5
Great Blue Heron	<i>Ardea herodias</i>	10
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	5
Great Egret	<i>Ardea alba</i>	10
Great Horned Owl	<i>Bubo virginianus</i>	10
Greater Prairie Chicken	<i>Tympanuchus cupido</i>	10
Greater Sage Grouse	<i>Centrocercus urophasianus</i>	15

South Dakota Wildlife Action Plan

Great-tailed Grackle	<i>Quiscalus mexicanus</i>	5
Green Heron	<i>Butorides virescens</i>	5
Green-tailed Towhee	<i>Pipilo chlorurus</i>	5
Green-winged Teal	<i>Anas crecca</i>	10
Gyr Falcon	<i>Falco rusticolus</i>	20
Hairy Woodpecker	<i>Picoides villosus</i>	5
Henslow's Sparrow	<i>Ammodramus henslowii</i>	5
Herring Gull	<i>Larus argentatus</i>	5
Hooded Merganser	<i>Lophodytes cucullatus</i>	10
Horned Grebe	<i>Podiceps auritus</i>	5
Horned Lark	<i>Eremophila alpestris</i>	5
House Finch	<i>Haemorhous mexicanus</i>	5
House Sparrow	<i>Passer domesticus</i>	5
House Wren	<i>Troglodytes aedon</i>	5
Indigo Bunting	<i>Passerina cyanea</i>	5
Interior Least Tern	<i>Sternula antillarum athalassos</i>	5
Killdeer	<i>Charadrius vociferus</i>	5
King Rail	<i>Rallus elegans</i>	5
Lark Bunting	<i>Calamospiza melanocorys</i>	5
Lark Sparrow	<i>Chondestes grammacus</i>	5
Lazuli Bunting	<i>Passerina amoena</i>	5
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	5
Least Bittern	<i>Ixobrychus exilis</i>	5
Least Flycatcher	<i>Empidonax minimus</i>	5
Lesser Scaup	<i>Aythya affinis</i>	10
Lewis's Woodpecker	<i>Melanerpes lewis</i>	5
Little Blue Heron	<i>Egretta caerulea</i>	10
Loggerhead Shrike	<i>Lanius ludovicianus</i>	5
Long-billed Curlew	<i>Numenius americanus</i>	5
Long-eared Owl	<i>Asio otus</i>	5
MacGillivray's Warbler	<i>Geothlypis tolmiei</i>	5
Mallard	<i>Anas platyrhynchos</i>	10
Marbled Godwit	<i>Limosa fedoa</i>	5
Marsh Wren	<i>Cistothorus palustris</i>	5
McCown's Longspur	<i>Rhynchophanes mccownii</i>	5
Merlin	<i>Falco columbarius</i>	10
Mountain Bluebird	<i>Sialia currucoides</i>	5
Mountain Plover	<i>Charadrius montanus</i>	5
Mourning Dove	<i>Zenaida macroura</i>	10
Nelson's Sparrow	<i>Ammodramus nelsoni</i>	5
Neotropical Cormorant	<i>Phalacrocorax brasilianus</i>	10
Northern Bobwhite	<i>Colinus virginianus</i>	5
Northern Cardinal	<i>Cardinalis cardinalis</i>	5
Northern Flicker	<i>Colaptes auratus</i>	5
Northern Goshawk	<i>Accipiter gentilis</i>	15

South Dakota Wildlife Action Plan

Northern Harrier	<i>Circus cyaneus</i>	10
Northern Mockingbird	<i>Mimus polyglottos</i>	5
Northern Pintail	<i>Anas acuta</i>	10
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	5
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	5
Northern Shoveler	<i>Anas clypeata</i>	10
Olive-sided Flycatcher	<i>Contopus cooperi</i>	5
Orchard Oriole	<i>Icterus spurius</i>	5
Osprey	<i>Pandion haliaetus</i>	20
Ovenbird	<i>Seiurus aurocapilla</i>	5
Peregrine Falcon	<i>Falco peregrinus</i>	20
Pied-billed Grebe	<i>Podilymbus podiceps</i>	10
Pileated Woodpecker	<i>Dryocopus pileatus</i>	5
Pine Siskin	<i>Spinus pinus</i>	5
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	5
Piping Plover	<i>Charadrius melodus</i>	5
Plumbeous Vireo	<i>Vireo plumbeus</i>	5
Prairie Falcon	<i>Falco mexicanus</i>	20
Purple Martin	<i>Progne subis</i>	5
Pygmy Nuthatch	<i>Sitta pygmaea</i>	5
Red Crossbill	<i>Loxia curvirostra</i>	5
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	5
Red-breasted Nuthatch	<i>Sitta canadensis</i>	5
Red-eyed Vireo	<i>Vireo olivaceus</i>	5
Redhead	<i>Aythya americana</i>	10
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	5
Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>	5
Red-necked Grebe	<i>Podiceps grisegena</i>	5
Red-tailed Hawk	<i>Buteo jamaicensis</i>	10
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	5
Ring-billed Gull	<i>Larus delawarensis</i>	5
Ring-necked Duck	<i>Aythya collaris</i>	10
Ring-necked Pheasant	<i>Phasianus colchicus</i>	10
Rock Pigeon	<i>Columba livia</i>	10
Rock Wren	<i>Salpinctes obsoletus</i>	5
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	5
Rough-legged Hawk	<i>Buteo lagopus</i>	10
Ruby-crowned Kinglet	<i>Regulus calendula</i>	5
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	5
Ruddy Duck	<i>Oxyura jamaicensis</i>	10
Ruffed Grouse	<i>Bonasa umbellus</i>	15
Sage Thrasher	<i>Oreoscoptes montanus</i>	5
Savannah Sparrow	<i>Passerculus sandwichensis</i>	5
Say's Phoebe	<i>Sayornis saya</i>	5
Scarlet Tanager	<i>Piranga olivacea</i>	5

South Dakota Wildlife Action Plan

Sedge Wren	<i>Cistothorus platensis</i>	5
Sharp-shinned Hawk	<i>Accipiter striatus</i>	10
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	15
Short-eared Owl	<i>Asio flammeus</i>	5
Snowy Egret	<i>Egretta thula</i>	10
Song Sparrow	<i>Melospiza melodia</i>	5
Sora	<i>Porzana carolina</i>	5
Spotted Sandpiper	<i>Actitis macularius</i>	5
Spotted Towhee	<i>Pipilo maculatus</i>	5
Sprague's Pipit	<i>Anthus spragueii</i>	5
Swainson's Hawk	<i>Buteo swainsoni</i>	10
Swainson's Thrush	<i>Catharus ustulatus</i>	5
Swamp Sparrow	<i>Melospiza georgiana</i>	5
Townsend's Solitaire	<i>Myadestes townsendi</i>	5
Tree Swallow	<i>Tachycineta bicolor</i>	5
Tricolored Heron	<i>Egretta tricolor</i>	10
Trumpeter Swan	<i>Cygnus buccinator</i>	10
Turkey Vulture	<i>Cathartes aura</i>	10
Upland Sandpiper	<i>Bartramia longicauda</i>	5
Veery	<i>Catharus fuscescens</i>	5
Vesper Sparrow	<i>Pooecetes gramineus</i>	5
Violet-green Swallow	<i>Tachycineta thalassina</i>	5
Virginia Rail	<i>Rallus limicola</i>	5
Virginia's Warbler	<i>Oreothlypis virginiae</i>	5
Warbling Vireo	<i>Vireo gilvus</i>	5
Western Grebe	<i>Aechmophorus occidentalis</i>	10
Western Kingbird	<i>Tyrannus verticalis</i>	5
Western Meadowlark	<i>Sturnella neglecta</i>	5
Western Tanager	<i>Piranga ludoviciana</i>	5
Western Wood-pewee	<i>Contopus sordidulus</i>	5
Whip-poor-will	<i>Antrostomus vociferus</i>	5
White-breasted Nuthatch	<i>Sitta carolinensis</i>	5
White-faced Ibis	<i>Plegadis chihi</i>	10
White-throated Swift	<i>Aeronautes saxatalis</i>	5
White-winge Junco	<i>Junco hyemalis aikeni</i>	5
White-winged Crossbill	<i>Loxia leucoptera</i>	5
Whooping Crane	<i>Grus americana</i>	15
Wild Turkey	<i>Meleagris gallopavo</i>	15
Willet	<i>Tringa semipalmata</i>	5
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	5
Willow Flycatcher	<i>Empidonax traillii</i>	5
Wilson's Phalarope	<i>Phalaropus tricolor</i>	5
Wilson's Snipe	<i>Gallinago delicata</i>	5
Wood Duck	<i>Aix sponsa</i>	10
Wood Thrush	<i>Hylocichla mustelina</i>	5

South Dakota Wildlife Action Plan

Yellow Rail	<i>Coturnicops noveboracensis</i>	5
Yellow Warbler	<i>Setophaga petechia</i>	5
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	5
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	5
Yellow-breasted Chat	<i>Icteria virens</i>	5
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	10
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	5
Yellow-rumped Warbler	<i>Setophaga coronata</i>	5
Yellow-throated Vireo	<i>Vireo flavifrons</i>	5
Terrestrial Insects		
Acadian Hairstreak	<i>Satyrium acadicum</i>	5
Afranius Duskywing	<i>Erynnis afranius</i>	10
Alcestis Fritillary	<i>Speyeria aphrodite alcestis</i>	10
American Burying Beetle	<i>Nicrophorus americanus</i>	1
American Lady	<i>Vanessa virginiensis</i>	2
American Snout	<i>Libytheana carinenta bachmanii</i>	2
Anise Swallowtail	<i>Papilio zelicaon nitra</i>	20
Arctic Blue	<i>Agriades glandon rusticus</i>	10
Arogos Skipper	<i>Atrytone arogos iowa</i>	10
Arrowhead Blue	<i>Glaucopsyche piasus daunia</i>	10
Atlantis Fritillary	<i>Speyeria atlantis</i>	10
Banded Hairstreak	<i>Satyrium calanus falacer</i>	10
Barred Yellow	<i>Eurema daira</i>	10
Bees		1
Belfragi's Chlorochroan Bug	<i>Chlorochroa belfragii</i>	1
Black Swallowtail	<i>Papilio polyxenes asterius</i>	20
Boisduval'S Blue	<i>Icaricia iacrioides pembina</i>	10
Broad-Winged Skipper	<i>Poanes viator</i>	5
Bronze Copper	<i>Lycaena hyllus</i>	4
Brown Elfin	<i>Callophrys augustinus</i>	10
Cabbage White	<i>Pieris rapae</i>	10
California Tortoiseshell	<i>Nymphalis californica</i>	20
Callippe Fritillary	<i>Speyeria callippe calgariana</i>	10
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>	20
Checkered White	<i>Pontia protodice</i>	10
Christina Sulphur	<i>Colias christina krauthii</i>	10
Clouded Sulphur	<i>Colias philodice</i>	10
Cloudless Sulphur	<i>Phoebis sennae eubele</i>	10
Common Buckeye	<i>Junonia coenia</i>	2
Common Checkered Skipper	<i>Pyrgus communis</i>	10
Common Roadside Skipper	<i>Amblyscirtes vialis</i>	10
Common Sootywing	<i>Pholisora catullus</i>	10
Common Wood-Nymph	<i>Cercyonis pegala nephele</i>	5
Compton'S Tortoiseshell	<i>Nymphalis vaualbum j-album</i>	20
Coral Hairstreak	<i>Satyrium titus</i>	10

South Dakota Wildlife Action Plan

Coronis Fritillary	<i>Speyeria coronis</i>	10
Crossline Skipper	<i>Polites origenes rhena</i>	10
Dainty Sulphur	<i>Nathalis iole</i>	20
Dakota Skipper	<i>Hesperia dacotae</i>	10
Dark Wood-Nymph	<i>Cercyonis oetus charon</i>	5
Delaware Skipper	<i>Anatrytone logan lagus</i>	10
Dion Skipper	<i>Euphyes dion</i>	5
Dog Face	<i>Zerene cesonia</i>	10
Dreamy Duskywing	<i>Erynnis icelus</i>	10
Dusted Skipper	<i>Atrytonopsis hianna</i>	10
Eastern Comma	<i>Polygonia comma</i>	20
Eastern Dun Skipper	<i>Euphyes vestris metacomet</i>	10
Eastern Tailed-Blue	<i>Everes comyntas</i>	10
Eastern Tiger Swallowtail	<i>Papilio glaucus</i>	20
Edwards' Fritillary	<i>Speyeria edwardsii</i>	10
Edwards' Hairstreak	<i>Satyrrium edwardsii</i>	10
Eufala Skipper	<i>Lerodea eufala</i>	10
Eyed Brown	<i>Satyrodes eurydice</i>	5
Field Crescent	<i>Phyciodes pratensis camillus</i>	10
Fiery Skipper	<i>Hylephila phyleus</i>	10
Garita Skipperling	<i>Oarisma garita</i>	10
Ghost Tiger Beetle	<i>Cicindela lepida</i>	5
Giant Swallowtail	<i>Papilio cressphontes</i>	20
Goatweed Butterfly	<i>Anaea andria</i>	20
Gorgone Checkerspot	<i>Chlosyne gorgone carlota</i>	10
Gray Comma	<i>Polygonia progne</i>	20
Gray Copper	<i>Lycaena dione</i>	4
Gray Hairstreak	<i>Strymon melinus franki</i>	10
Great Plains Giant Tiger Beetle	<i>Amblycheila cylindriformis</i>	10
Great Southern White	<i>Ascia monuste</i>	10
Great Spangled Fritillary	<i>Speyeria cybele</i>	10
Green Comma	<i>Polygonia faunus hylas</i>	20
Greenish Blue	<i>Plebejus saepiolus amica</i>	10
Gulf Fritillary	<i>Agraulis vanillae</i>	2
Hackberry Emperor	<i>Asterocampa celtis celtis</i>	10
Harvester	<i>Feniseca tarquinius</i>	5
Hayhurst'S Scallopwing	<i>Staphylus hayhurstii</i>	10
Hoary Comma	<i>Polygonia gracilis zephyrus</i>	20
Hoary Elfin	<i>Callophrys polia obscura</i>	10
Hobomok Skipper	<i>Poanes hobomok</i>	10
Horace'S Duskywing	<i>Erynnis horatius</i>	10
Indian Creek Tiger Beetle	<i>Cicindela nevadica makosika</i>	10
Indra Swallowtail	<i>Papilio indra</i>	20
Iowa Skipper	<i>Atrytone arogos iowa</i>	10
Juba Skipper	<i>Hesperia juba</i>	10

South Dakota Wildlife Action Plan

Juniper Hairstreak	<i>Callophrys gryneus siva</i>	10
Juvenal'S Duskywing	<i>Erynnis juvenalis</i>	10
Kiowah Skipper	<i>Euphyes vestris kiowah</i>	10
Kohler'S Fritillary	<i>Boloria selene sabulocollis</i>	10
Large Marble	<i>Euchloe ausonides palaeoreios</i>	10
Large Orange Sulphur	<i>Phoebis agarithe</i>	10
Least Skipper	<i>Ancyloxypha numitor</i>	10
Leonard'S Skipper	<i>Hesperia leonardus pawnee</i>	10
Little Glassywing	<i>Pompeius verna</i>	10
Little Wood-Satyr	<i>Megisto cymela</i>	5
Little Yellow	<i>Eurema lisa</i>	2
Long Dash	<i>Polites mystic dacotah</i>	10
Lupine Blue	<i>Icaricia lupini</i>	10
Manitoba Fritillary	<i>Speyeria aphrodite manitoba</i>	10
Marine Blue	<i>Leptotes marina</i>	10
Meadow Fritillary	<i>Boloria bellona</i>	10
Mead'S Wood-Nymph	<i>Cercyonis meadii</i>	5
Melissa Blue	<i>Lycaeides melissa</i>	10
Mexican Yellow	<i>Eurema mexicanum</i>	10
Milbert'S Tortoiseshell	<i>Nymphalis milberti</i>	20
Monarch	<i>Danaus plexippus</i>	20
Mormon Fritillary	<i>Speyeria mormonia</i>	10
Mormon Metalmark	<i>Apodemia mormo</i>	5
Mottled Duskywing	<i>Erynnis martialis</i>	10
Mountain Emperor	<i>Asterocampa celtis antonia</i>	10
Mourning Cloak	<i>Nymphalis antiopa</i>	20
Mulberry Wing	<i>Poanes massasoit</i>	5
Mustard White	<i>Pieris oleracea</i>	10
Myrina Fritillary	<i>Boloria selene myrina</i>	10
Nevada Skipper	<i>Hesperia nevada</i>	10
Nevada Tiger Beetle	<i>Cicindela nevadica</i>	10
Northern Broken Dash	<i>Wallengrenia egeremet</i>	10
Northern Cloudywing	<i>Thorybes pylades</i>	10
Northern Crescent	<i>Phyciodes cocyta</i>	10
Northern Pearly-Eye	<i>Enodia anthedon</i>	5
Northwestern Fritillary	<i>Speyeria hesperis lurana</i>	10
Ochre Ringlet	<i>Coenonympha tullia ochracea</i>	5
Old World Swallowtail	<i>Papilio machaon bairdii</i>	20
Olive Hairstreak	<i>Callophrys gryneus gryneus</i>	10
Olympia Marble	<i>Euchloe olympia</i>	10
Orange Sulphur	<i>Colias eurytheme</i>	10
Oslar'S Roadside Skipper	<i>Amblyscirtes oslari</i>	10
Ottoa Skipper	<i>Hesperia ottoa</i>	10
Pahaska Skipper	<i>Hesperia pahaska</i>	10
Painted Lady	<i>Vanessa cardui</i>	2

South Dakota Wildlife Action Plan

Pale Crescent	<i>Phyciodes pallidus barnesi</i>	10
Pale Swallowtail	<i>Papilio eurymedon</i>	20
Pearl Crescent	<i>Phyciodes tharos</i>	10
Peck'S Skipper	<i>Polites peckius</i>	10
Persius Duskywing	<i>Erynnis persius fredericki</i>	5
Pine White	<i>Neophasia menapia</i>	10
Pipevine Swallowtail	<i>Battus philenor</i>	20
Plains Skipper	<i>Hesperia assiniboia</i>	10
Powesheik Skipperling	<i>Oarisma poweshiek</i>	10
Prairie Ringlet	<i>Coenonympha tullia benjamini</i>	5
Purplish Copper	<i>Lycaena helloides</i>	4
Queen Alexandra'S Sulphur	<i>Colias alexandra</i>	10
Question Mark	<i>Polygonia interrogationis</i>	20
Reakirt'S Blue	<i>Hemiargus isola</i>	10
Red Admiral	<i>Vanessa atalanta rubria</i>	2
Red-Spotted Purple	<i>Limenitis arthemis astyanax</i>	20
Regal Fritillary	<i>Speyeria idalia</i>	10
Rhesus Skipper	<i>Polites rhesus</i>	10
Ridings' Satyr	<i>Neominois ridingsii</i>	5
Rocky Mountain Parnassian	<i>Parnassiis smintheus sayii</i>	10
Ruddy Copper	<i>Lycaena rubidus longi</i>	4
Sachem	<i>Atalopedes campestris</i>	20
Sagebrush Checkerspot	<i>Chlosyne acastus</i>	10
Satyr Comma	<i>Polygonia satyrus</i>	20
Shasta Blue	<i>Icaricia shasta minnehaha</i>	10
Silver-Spotted Skipper	<i>Epargyreus clarus</i>	10
Silvery Blue	<i>Glaucopsyche lygdamus oro</i>	10
Silvery Checkerspot	<i>Chlosyne nycteis</i>	10
Simius Roadside Skipper	<i>Amblyscirtes simius</i>	10
Sleepy Duskywing	<i>Erynnis brizo</i>	10
Sleepy Orange	<i>Eurema nicippe</i>	2
Small Checkered Skipper	<i>Pyrgus scriptura</i>	10
Spicebush Swallowtail	<i>Papilio troilus</i>	20
Spring Azure	<i>Celastrina ladon sidara</i>	10
Spring White	<i>Pontia sisymbrii nordini</i>	10
Stella Orangetip	<i>Anthocharis stella</i>	10
Strecker'S Giant Skipper	<i>Megathymus streckeri leussleri</i>	10
Striped Hairstreak	<i>Satyrrium liparops aliparops</i>	10
Summer Azure	<i>Celastrina neglecta</i>	10
Tawny Crescent	<i>Phyciodes batesii</i>	10
Tawny Emperor	<i>Asterocampa clyton</i>	10
Tawny-Edged Skipper	<i>Polites themistocles</i>	10
Taxiles Skipper	<i>Poanes taxiles</i>	10
Texan Crescent	<i>Phyciodes texana</i>	10
Two-Spotted Skipper	<i>Euphyes bimacula illinois</i>	5

South Dakota Wildlife Action Plan

Two-Tailed Swallowtail	<i>Papilio multicaudatus</i>	20
Uhler'S Arctic	<i>Oeneis uhleri varuna</i>	10
Uncas Skipper	<i>Hesperia uncas</i>	10
Variable Checkerspot	<i>Euphydryas chalcedona bernadetta</i>	10
Variiegated Fritillary	<i>Euptoieta claudia</i>	2
Viceroy	<i>Limenitis archippus</i>	20
Weidemeyer'S Admiral	<i>Limenitis weidemeyerii oberfoelli</i>	20
West Coast Lady	<i>Vanessa annabella</i>	2
Western Branded Skipper	<i>Hesperia colorado idaho</i>	10
Western Pine Elfyn	<i>Callophrys eryphon</i>	10
Western Tailed-Blue	<i>Everes amyntula valeriae</i>	10
Western Tiger Swallowtail	<i>Pterourus rutulus</i>	20
Western White	<i>Pontia occidentalis</i>	10
White Admiral	<i>Limenitis arthemis arthemis</i>	20
Woodland Skipper	<i>Ochlodes sylvanoides napa</i>	10
Zabulon Skipper	<i>Poanes zabulon</i>	10
Zerene Fritillary	<i>Speyeria zerene sinope</i>	10
Mammals		
American Pygmy Shrew	<i>Sorex hoyi</i>	5
American Water Shrew	<i>Sorex palustris</i>	5
Arctic Shrew	<i>Sorex arcticus</i>	5
Badger	<i>Taxidea taxus</i>	5
Bailey's Eastern Woodrat	<i>Neotoma floridana baileyi</i>	5
Bear Lodge Meadow Jumping Mouse	<i>Zapus hudsonius campestris</i>	5
Big Brown Bat	<i>Eptesicus fuscus</i>	5
Bighorn Sheep	<i>Ovis canadensis</i>	50
Black-footed Ferret	<i>Mustela nigripes</i>	10
Black-tailed Jackrabbit	<i>Lepus californicus</i>	10
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	5
Canadian Lynx	<i>Lynx canadensis</i>	100
Cougar	<i>Puma concolor</i>	40
Deer	<i>Odocoileus virginianus</i>	5
Deer Mouse	<i>Peromyscus maniculatus</i>	5
Dwarf Shrew	<i>Sorex nanus</i>	5
Eastern Chipmunk	<i>Tamias striatus</i>	5
Eastern Cottontail	<i>Sylvilagus floridanus</i>	10
Eastern Fox Squirrel	<i>Sciurus niger</i>	5
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	5
Eastern Red Bat	<i>Lasiurus borealis</i>	5
Elk	<i>Cervus elaphus</i>	50
Evening Bat	<i>Nycticeius humeralis</i>	5
Franklin's Ground Squirrel	<i>Poliocitellus franklinii</i>	5
Fringe-tailed Myotis	<i>Myotis thysanodes pahasapensis</i>	5
Harvest Mouse	<i>Reithrodontomys megalotis</i>	5
Hayden's Shrew	<i>Sorex haydeni</i>	5

South Dakota Wildlife Action Plan

Hispid Pocket Mouse	<i>Chaetodipus hispidus</i>	5
Hoary Bat	<i>Lasiurus cinereus</i>	5
House Mouse	<i>Mus musculus</i>	5
Least Weasel	<i>Mustela nivalis</i>	5
Long-eared Myotis	<i>Myotis evotis</i>	5
Long-tailed Vole	<i>Microtus longicaudus</i>	5
Meadow Jumping Mouse	<i>Zapus hudsonius</i>	5
Meadow Vole	<i>Microtus pennsylvanicus</i>	5
Merriam's Shrew	<i>Sorex merriami</i>	5
Mink	<i>Neovison vison</i>	100
Mule Deer	<i>Odocoileus hemionus</i>	5
Muskrat	<i>Ondatra zibethicus</i>	5
North American Least Shrew	<i>Cryptotis parva</i>	5
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	5
Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>	5
Northern Myotis	<i>Myotis septentrionalis</i>	5
Northern River Otter	<i>Lontra canadensis</i>	50
Plains Harvest Mouse	<i>Reithrodontomys montanus</i>	5
Plains Pocket Mouse	<i>Perognathus flavescens</i>	5
Plains Spotted Skunk	<i>Spilogale putorius interrupta</i>	10
Prairie Vole	<i>Microtus ochrogaster</i>	5
Pronghorn	<i>Antilocapra americana</i>	16
Raccoon	<i>Procyon lotor</i>	15
Red Fox	<i>Vulpes vulpes</i>	15
Sagebrush Vole	<i>Lemmiscus curtatus</i>	5
Short-tailed Shrew	<i>Blarina brevicauda</i>	5
Short-tailed Weasel	<i>Mustela erminea</i>	5
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	5
Southern Bog Lemming	<i>Synaptomys cooperi</i>	5
Southern Red-backed Vole	<i>Myodes gapperi</i>	5
Spotted Ground Squirrel	<i>Xerospermophilus spilosoma</i>	5
Striped Skunk	<i>Mephitis mephitis</i>	10
Swift Fox	<i>Vulpes velox</i>	15
Thirteen-lined Ground Squirrel	<i>Ictidomys tridecemlineatus</i>	5
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	5
Western Harvest Mouse	<i>Reithrodontomys megalotis</i>	5
White-footed Mouse	<i>Peromyscus leucopus</i>	5
Woodchuck	<i>Marmota monax</i>	5

Plant Communities

Silver Maple-American Elm Forest	<i>Acer saccharinum-elmus americana forest</i>	1
Alaska Oniongrass	<i>Melica subulata</i>	1
Alderleaf Buckthorn	<i>Rhamnus alnifolia</i>	1
Alkali Marsh Aster	<i>Almutaster pauciflorus</i>	1
American Beakgrain	<i>Diarrhena americana</i>	1

South Dakota Wildlife Action Plan

American Ginseng	<i>Panax quinquefolius</i>	1
American Gromwell	<i>Lithospermum latifolium</i>	1
American Milkvetch	<i>Astragalus americanus</i>	1
American Rockbrake	<i>Cryptogramma acrostichoides</i>	1
American Silverberry	<i>Elaeagnus commutata</i>	1
American Spikenard	<i>Aralia racemosa</i>	1
American Thorowax	<i>Bupleurum americanum</i>	1
American Trailplant	<i>Adenocaulon bicolor</i>	1
American Water-lily	<i>Nymphaea odorata</i>	1
American Yellow Lady's-slipper	<i>Cypripedium parviflorum</i>	1
Big Bluestem community	<i>Andropogon gerardii</i> community	1
Arrowleaf Sweet-colt's-foot	<i>Petasites sagittatus</i>	1
Sand sagebrush/sand reedgrass shrubland	<i>Artemisia filifolia/calamovilfa longifolia</i> shrubland	1
Autumn Coralroot	<i>Corallorhiza odontorhiza</i>	1
Autumn Willow	<i>Salix serissima</i>	1
Balsam Poplar	<i>Populus balsamifera</i>	1
Barr's Milkvetch	<i>Astragalus barrii</i>	1
Beaked Spikerush	<i>Eleocharis rostellata</i>	1
Beautiful Sedge	<i>Carex concinna</i>	1
Beckwith's Clover	<i>Trifolium beckwithii</i>	1
Bog birch-Willow species rich transition fen shrubland	<i>Betula pumila-salix</i> spp. rich transition fen shrubland	1
Bicknell's Northern Crane's-bill	<i>Geranium bicknellii</i>	1
Bitter Fleabane	<i>Erigeron acris</i>	1
Black Walnut	<i>Juglans nigra</i>	1
Bloodroot	<i>Sanguinaria canadensis</i>	1
Blue Cohosh	<i>Caulophyllum thalictroides</i>	1
Blunt Broom Sedge	<i>Carex tribuloides</i>	1
Bog Buckbean	<i>Menyanthes trifoliata</i>	1
Boreal Aster	<i>Symphyotrichum boreale</i>	1
Branched False Goldenweed	<i>Oenopsis multicaulis</i>	1
Bristly-stalk Sedge	<i>Carex leptalea</i> ssp. <i>leptalea</i>	1
Broadleaf Twayblade	<i>Listera convallarioides</i>	1
Broadleaf Water-milfoil	<i>Myriophyllum heterophyllum</i>	1
Broom Groundsel	<i>Senecio spartioides</i>	1
Brownish Sedge	<i>Carex brunnescens</i>	1
Buff Fleabane	<i>Erigeron ochroleucus</i>	1
Bulblet Fern	<i>Cystopteris bulbifera</i>	1
Bulbous Woodland-star	<i>Lithophragma glabrum</i>	1
Bur-reed Sedge	<i>Carex sparganioides</i>	1
Caespitose Rockmat	<i>Petrophytum caespitosum</i>	1
California Oatgrass	<i>Danthonia californica</i>	1
Canada Rush	<i>Juncus canadensis</i>	1
Canada Wild Ginger	<i>Asarum canadense</i>	1
Inland sedge and spike rush community	<i>Carex interior-eleocharis erythropoda</i> community	1

South Dakota Wildlife Action Plan

Carpenter's Square Figwort	<i>Scrophularia marilandica</i>	1
Cattail Gayfeather	<i>Liatris pycnostachya</i>	
Mountain mahogany/sideoats grama shrubland	<i>Cercocarpus montanus/bouteloua</i> <i>curtipendula shrubland</i>	1
Chamomile Grapefern	<i>Botrychium matricariifolium</i>	1
Clustered Leather-flower	<i>Clematis hirsutissima</i>	1
Common Labrador Tea	<i>Ledum groenlandicum</i>	1
Common Moonwort	<i>Botrychium lunaria</i>	1
Compass Plant	<i>Silphium laciniatum</i>	
Cottongrass Bulrush	<i>Scirpus cyperinus</i>	1
Culver's-root	<i>Veronicastrum virginicum</i>	1
Cutleaf Toothwort	<i>Cardamine concatenata</i>	1
Dakota Buckwheat	<i>Eriogonum visheri</i>	1
Downy Gentian	<i>Gentiana puberulenta</i>	1
Drummond's Thistle	<i>Cirsium drummondii</i>	1
Dwarf Scouring-rush	<i>Equisetum scirpoides</i>	1
Early Coralroot	<i>Corallorhiza trifida</i>	1
Eastern Marsh Fern	<i>Thelypteris palustris</i>	1
Eastern Wild Rice	<i>Zizania aquatica</i>	1
Elegant Sedge	<i>Carex bella</i>	1
Common spikerush	<i>Eleocharis palustris</i>	1
Entireleaf Stonecrop	<i>Rhodiola integrifolia</i>	1
Exposed sandbar		1
Fairy Slipper	<i>Calypto bulbosa</i>	1
False Rue-anemone	<i>Enemion biternatum</i>	1
Fen Grass-of-Parnassus	<i>Parnassia glauca</i>	1
Fendler's Broomspurge	<i>Chamaesyce fendleri</i>	1
Fendler's Whitethorn	<i>Ceanothus fendleri</i>	1
Five-point Bishop's-cap	<i>Mitella pentandra</i>	1
Flat-top White Aster	<i>Doellingeria umbellata</i>	1
Floriferous Monkeyflower	<i>Mimulus floribundus</i>	1
Four-flower Yellow Loosestrife	<i>Lysimachia quadriflora</i>	1
Four-point Evening-primrose	<i>Oenothera rhombipetala</i>	1
Foxtail Sedge	<i>Carex alopecoidea</i>	1
Frenchman's Bluff Moonwort	<i>Botrychium gallicomontanum</i>	1
Fresh limnetic lake		1
Giant Helleborine	<i>Epipactis gigantea</i>	1
Glomerate Sedge	<i>Carex aggregata</i>	1
Golden Puccoon	<i>Lithospermum caroliniense</i>	1
Grassleaf Rush	<i>Juncus marginatus</i>	1
Gray's Lousewort	<i>Pedicularis procera</i>	1
Great Basin Navarretia	<i>Navarretia intertexta ssp. propinqua</i>	1
Great Plains Ladies'-tresses	<i>Spiranthes magnicamporum</i>	1
Great Plains Marl Fen		1
Greater Bladder Sedge	<i>Carex intumescens</i>	1
Great-spurred Violet	<i>Viola selkirkii</i>	1

South Dakota Wildlife Action Plan

Green Spleenwort	<i>Asplenium viride</i>	1
Greene's Mountain-ash	<i>Sorbus scopulina</i>	1
Green-flower Hedgehog Cactus	<i>Echinocereus viridiflorus</i>	1
Greenfruit Bur-reed	<i>Sparganium angustifolium</i>	1
Groove-stem Indian-plantain	<i>Arnoglossum plantagineum</i>	1
Hairlike Sedge	<i>Carex capillaris</i>	1
Hairy Woodrush	<i>Luzula acuminata</i>	1
Hoary Pincushion	<i>Chaenactis douglasii</i>	1
Hoary Sedge	<i>Carex canescens</i>	1
Hoary Willow	<i>Salix candida</i>	1
Holly-leaf Naiad	<i>Najas marina</i>	1
Hooker's Mandarin	<i>Prosartes hookeri</i>	1
Hooker's Townsend-daisy	<i>Townsendia hookeri</i>	1
Hopi-tea	<i>Thelesperma megapotamicum</i>	1
Horned Beakrush	<i>Rhynchospora capillacea</i>	1
Idaho Fescue	<i>Festuca idahoensis</i>	1
Indian-pipe	<i>Monotropa uniflora</i>	1
Inflated Sedge	<i>Carex vesicaria</i>	1
Interrupted Wild Rye	<i>Elymus diversiglumis</i>	1
James' Cat's-eye	<i>Cryptantha cinerea</i>	1
Jame's Cristatella	<i>Polanisia jamesii</i>	1
Jointed Rush	<i>Juncus articulatus</i>	1
Jointed-spike Sedge	<i>Carex athrostachya</i>	1
Creeping juniper/sedge dwarf shrubland	<i>Juniperus horizontalis/carex spp.dwarf-shrubland</i>	1
Kalm's Lobelia	<i>Lobelia kalmii</i>	1
Kentucky Coffeetree	<i>Gymnocladus dioicus</i>	1
Kidneyleaf White Violet	<i>Viola renifolia</i>	1
Lake-bank Sedge	<i>Carex lacustris</i>	1
Large-flower Bellwort	<i>Uvularia grandiflora</i>	1
Large-flower Townsend-daisy	<i>Townsendia grandiflora</i>	1
Large-flowered Ground-cherry	<i>Leucophysalis grandiflora</i>	1
Largeleaf Pondweed	<i>Potamogeton amplifolius</i>	1
Leafy White Orchid	<i>Platanthera dilatata</i>	1
Least Grapefern	<i>Botrychium simplex</i>	1
Leathery Grapefern	<i>Botrychium multifidum</i>	1
Lesser Fringed Gentian	<i>Gentianopsis procera</i>	1
Lesser Roundleaf Orchid	<i>Platanthera orbiculata</i>	1
Limber Pine	<i>Pinus flexilis</i>	1
Linearleaf Phacelia	<i>Phacelia linearis</i>	1
Little Green Sedge	<i>Carex viridula</i>	1
Lodgepole Pine	<i>Pinus contorta</i>	1
Loesel's Twayblade	<i>Liparis loeselii</i>	1
Longstalk Sedge	<i>Carex pedunculata</i>	1
Long-tubed Evening-primrose	<i>Oenothera flava</i>	1
Lower intermittent stream		1

South Dakota Wildlife Action Plan

Lower perennial stream		1
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>	1
Marsh Grass-of-Parnassus	<i>Parnassia palustris</i>	1
Marsh Muhly	<i>Muhlenbergia glomerata</i>	1
Michigan Lily	<i>Lilium michiganense</i>	1
Mountain Bladderpod	<i>Lesquerella montana</i>	1
Mountain Cat's-eye	<i>Cryptantha cana</i>	1
Mountain Timothy	<i>Phleum alpinum</i>	1
Mountain-sorrel	<i>Oxyria digyna</i>	1
Musk-root	<i>Adoxa moschatellina</i>	1
Narrowleaf Cotton-grass	<i>Eriophorum angustifolium</i>	1
Narrowleaf Cottonwood	<i>Populus angustifolia</i>	1
Narrowleaf Grapefern	<i>Botrychium lineare</i>	1
Narrowleaf Peatmoss	<i>Sphagnum angustifolium</i>	1
Narrowleaf Pinweed	<i>Lechea intermedia</i>	1
Narrowleaf Scurfpea	<i>Pediomelum linearifolium</i>	1
Narrowleaf White Meadowsweet	<i>Spiraea alba</i>	1
Nodding Saxifrage	<i>Saxifraga cernua</i>	1
Nodding Silverpuffs	<i>Microseris nutans</i>	1
Nodding Trillium	<i>Trillium cernuum</i>	1
North-central Maple - Basswood Forest	<i>Acer-Tilia american forest</i>	1
Northern Holly Fern	<i>Polystichum lonchitis</i>	1
Northern Maidenhair Fern	<i>Adiantum pedatum</i>	1
Northern Tallgrass Calcareous Fen		1
Northern Wet-Mesic Tallgrass Prairie		1
Northern Wild Comfrey	<i>Cynoglossum virginianum var. boreale</i>	1
Nuttall's Desert-parsley	<i>Lomatium nuttallii</i>	1
One-flower Wintergreen	<i>Moneses uniflora</i>	1
One-flowered Broomrape	<i>Orobanche uniflora</i>	1
Orange-flower False Dandelion	<i>Agoseris aurantiaca</i>	1
Pale Moonwort	<i>Botrychium pallidum</i>	1
Parry's Rabbitbrush	<i>Ericameria parryi</i>	1
	<i>Pascopyrum smithii-bouteloua</i>	
	<i>gracilis/carex filifolia herbaceous</i>	1
	<i>vegetation</i>	
	<i>Picea glauca alluvial black hills forest</i>	1
	<i>Picea glauca/linnaea borealis forest</i>	1
	<i>Pinus ponderosa/shizachyrium</i>	
	<i>scoparium sparse woodland</i>	1
Plains Lemmon Beebalm	<i>Monarda pectinata</i>	1
	<i>Populus deltoides/juniperus virginiana</i>	
	<i>floodplain forest</i>	1
	<i>Populus tremuloides/picea glauca black</i>	
	<i>hills forest</i>	1
Prairie Dunewort	<i>Botrychium campestre</i>	1
Prairie Gentian	<i>Gentiana affinis</i>	1
Prairie Milkweed	<i>Asclepias sullivantii</i>	1
Prairie Willow	<i>Salix humilis</i>	1

South Dakota Wildlife Action Plan

Purple Giant-hyssop	<i>Agastache scrophulariifolia</i>	1
Purple Sandgrass	<i>Triplasis purpurea</i>	1
	<i>Quercus macrocarpa northwestern tallgrass sparse woodland</i>	1
Richardson's Rush		1
Richardson's Sedge	<i>Carex richardsonii</i>	1
Riddell's Goldenrod	<i>Oligoneuron riddellii</i>	1
Rock Elm	<i>Ulmus thomasii</i>	1
Rock Polypody	<i>Polypodium virginianum</i>	1
Rock Sedge	<i>Carex rupestris</i>	1
Rough Rattlesnake-root	<i>Prenanthes aspera</i>	1
Round-head Bushclover	<i>Lespedeza capitata</i>	1
Saline littoral lake		1
Bebb's Willow shrubland	<i>Salix bebbiana shrubland</i>	1
Meadow Willow/Sedge spp. Shrubland	<i>Salix petiolaris/carex interior shrubland</i>	1
Sand Lovegrass	<i>Eragrostis trichodes</i>	1
	<i>Schizachyrium scoparium/bouteloua curtipendula community</i>	1
Little Bluestem/Sideoats Grama community		1
Bullrush-Cattail species community	<i>Scirpus spp./typha spp. Community</i>	1
Secund Bladderpod	<i>Lesquerella arenosa var. argillosa</i>	1
Sessile-leaf Bellwort	<i>Uvularia sessilifolia</i>	1
Sheathed Pondweed	<i>Stuckenia vaginata</i>	1
Sheathed Sedge	<i>Carex vaginata</i>	1
Shining Willow	<i>Salix lucida</i>	1
Showy Prairie-gentian	<i>Eustoma exaltatum ssp. russellianum</i>	1
Sicklepod	<i>Arabis canadensis</i>	1
Silky Dogwood	<i>Cornus amomum</i>	1
Silky Townsend-daisy	<i>Townsendia exscapa</i>	1
Sleepy Needlegrass	<i>Achnatherum robustum</i>	1
Slender Bog Orchid	<i>Platanthera stricta</i>	1
Slender Cotton-grass	<i>Eriophorum gracile</i>	1
Slender Mountain-ricegrass	<i>Piptatherum pungens</i>	1
Slender Phlox	<i>Phlox gracilis</i>	1
Slender Spikerush	<i>Eleocharis elliptica</i>	1
Slim-spike Three-awn Grass	<i>Aristida longespica</i>	1
Small White Lady's-slipper	<i>Cypripedium candidum</i>	1
Small-flower Sand-verbena	<i>Tripterocalyx micranthus</i>	1
Small-flower Woodrush	<i>Luzula parviflora</i>	1
Smooth Goosefoot	<i>Chenopodium subglabrum</i>	1
Smooth Hedge-nettle	<i>Stachys tenuifolia</i>	1
Smooth White Violet	<i>Viola macloskeyi</i>	1
Smooth Woody-aster	<i>Xylorhiza glabriuscula</i>	1
Snow Trillium	<i>Trillium nivale</i>	1
Soft Groovebur	<i>Agrimonia pubescens</i>	1
Southern Maidenhair Fern	<i>Adiantum capillus-veneris</i>	1
Spiked Standing-cypress	<i>Ipomopsis spicata</i>	1

South Dakota Wildlife Action Plan

Spinulose Shieldfern	<i>Dryopteris carthusiana</i>	1
Spring - coldwater		1
Spring - warmwater		1
Square-twigged Huckleberry	<i>Vaccinium membranaceum</i>	1
Squashberry	<i>Viburnum edule</i>	1
Stiff Clubmoss	<i>Lycopodium annotinum</i>	1
Stiff Tickseed	<i>Coreopsis palmata</i>	1
Needle-and-thread/blue grama community	<i>Stipa comata/bouteloua gracilis</i> community	1
Stout Wood Reedgrass	<i>Cinna arundinacea</i>	1
Streamside Bluebells	<i>Mertensia ciliata</i>	1
Subalpine Arnica	<i>Arnica rydbergii</i>	1
Summer Orophaca	<i>Astragalus hyalinus</i>	1
Sweetflag	<i>Acorus americanus</i>	1
Western snowberry shrubland	<i>Symphoricarpus occidentalis shrubland</i>	1
Three-nerved Goldenrod	<i>Solidago velutina</i>	1
Thrift Mock Goldenweed	<i>Stenotus armerioides</i>	1
Timber Milkvetch	<i>Astragalus miser</i>	1
Timberline Bluegrass	<i>Poa glauca ssp. rupicola</i>	1
Trailing Clubmoss	<i>Lycopodium complanatum</i>	1
Treelike Clubmoss	<i>Lycopodium dendroideum</i>	1
Tufted Hairgrass	<i>Deschampsia caespitosa</i>	1
Twisted Ladies'-tresses	<i>Spiranthes vernalis</i>	1
Cattail spp.	<i>Typha spp.</i>	1
Upper intermittent stream		1
Upper perennial stream - coldwater		1
Upper perennial stream - warm water		1
Upright Greenbrier	<i>Smilax ecirrhata</i>	1
Variiegated Horsetail	<i>Equisetum variegatum</i>	1
Wax-leaf Beardtongue	<i>Penstemon nitidus</i>	1
Western Prairie White-fringed Orchid	<i>Platanthera praeclara</i>	1
Western Saxifrage	<i>Saxifraga occidentalis</i>	1
Western Sedge	<i>Carex occidentalis</i>	1
Western Swordfern	<i>Polystichum munitum</i>	1
White Nodding Ladies'-tresses	<i>Spiranthes cernua</i>	1
White Rattlesnake-root	<i>Prenanthes alba</i>	1
White Trout-lily	<i>Erythronium albidum</i>	1
White-flower Standing-cypress	<i>Ipomopsis longiflora</i>	1
White-vein Wintergreen	<i>Pyrola picta</i>	1
Whole-leaf Rosinweed	<i>Silphium integrifolium</i>	1
Wild Blue Phlox	<i>Phlox divaricata</i>	1
Wild Crane's-bill	<i>nium maculatum</i>	1
Winged Cudweed		1
Wood Anemone	<i>Anemone quinquefolia</i>	1
Woodhouse's False Bahia	<i>Picradeniopsis woodhousei</i>	1
Woodland Bluegrass	<i>Poa sylvestris</i>	1

South Dakota Wildlife Action Plan

Woodland Lettuce	<i>Lactuca floridana</i>	1
Woolly Milkweed	<i>Asclepias lanuginosa</i>	1
Reptiles		
Black Hills Redbelly Snake	<i>Storeria occipitomaculata pahasapae</i>	5
Blanding's Turtle	<i>Emydoidea blandingii</i>	10
Brownsnake	<i>Storeria dekayi</i>	5
Bull Snake	<i>Pituophis catenifer</i>	10
Eastern Garter Snake	<i>Thamnophis sirtalis sirtalis</i>	10
Eastern Hognose Snake	<i>Heterodon platirhinos</i>	10
Eastern Yellow-belly Racer	<i>Coluber constrictor flaviventris</i>	5
False Map Turtle	<i>Graptemys pseudogeographica</i>	20
Five-lined Skink	<i>Plestiodon fasciatus</i>	5
Lesser Earless Lizard	<i>Holbrookia maculata</i>	5
Lined Snake	<i>Tropidoclonion lineatum</i>	5
Many-lined Skink	<i>Plestiodon multivirgatus</i>	5
Milk Snake	<i>Lampropeltis triangulum</i>	10
Northern Prairie Lizard	<i>Sceloporus undulatus</i>	5
Northern Prairie Skink	<i>Plestiodon septentrionalis</i>	5
Northern Redbelly Snake	<i>Storeria occipitomaculata occipitomaculata</i>	5
Northern Watersnake	<i>Nerodia sipedon</i>	10
Ornate Box Turtle	<i>Terrapene ornata</i>	5
Plains Garter Snake	<i>Thamnophis radix</i>	10
Red Milksnake	<i>Lampropeltis triangulum sypila</i>	5
Red-eared Slider	<i>Trachemys scripta elegans</i>	5
Ringneck Snake	<i>Diadophis punctatus</i>	5
Sagebrush Lizard	<i>Sceloporus graciosus</i>	5
Short-horned Lizard	<i>Phrynosoma hernandesi</i>	5
Six-lined Racer	<i>Aspidoscelis sexlineata</i>	5
Smooth Greensnake	<i>Opheodrys vernalis</i>	5
Smooth Softshell	<i>Apalone mutica</i>	20
Snapping Turtle	<i>Chelydra serpentina</i>	10
Spiny Softshell	<i>Apalone spinifera</i>	20
Terrestrial Gartersnake	<i>Thamnophis elegans</i>	10
Western Foxsnake	<i>Pantherophis ramspotti</i>	10
Western Hognose Snake	<i>Heterodon nasicus</i>	10
Western Painted Turtle	<i>Chrysemys picta</i>	3
Western Rattlesnake	<i>Crotalus viridis</i>	5
Terrestrial Gastropods		
Callused Vertigo	<i>Vertigo arthuri</i>	1
Cooper's Rocky Mountainsnail	<i>Oreohelix strigosa cooperi</i>	1
Frigid Ambersnail	<i>Catinella gelida</i>	1
Mystery Vertigo	<i>Vertigo paradoxa</i>	1

South Dakota Wildlife Action Plan

Appendix R. Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

Ecosite ID	Ecosite Type	MLRA	Ecosite Acres	10% Acre Goal	COA Acres Using Round 1 Criteria	COA Acres Using Round 2 Criteria	COA Acres Using Round 3 Criteria	Round # that met 10% COA Goal	Ecosite Goal %
R102AY011SD	CLAYEY	102A	241,611	24,161	50,791	0	0	1	21.0
R102AY013SD	CLAYPAN	102A	557	56	373	0	0	1	67.0
R102AY999SD	DISTURBED SITES	102A	4,971	497	1,358	0	0	1	27.3
R102AY010SD	LOAMY	102A	2,479,020	247,902	808,239	0	0	1	32.6
R102AY008SD	SANDS	102A	2,094	209	902	0	0	1	43.1
R102AY009SD	SANDY	102A	66,155	6,616	31,941	0	0	1	48.3
R102AY014SD	SHALLOW TO GRAVEL	102A	193,698	19,370	113,451	0	0	1	58.6
R102AY012SD	THIN UPLAND	102A	267,890	26,789	101,392	0	0	1	37.8
R102AY016SD	VERY SHALLOW	102A	30,864	3,086	20,208	0	0	1	65.5
R102BY011SD	CLAYEY	102B	1,200	120	173	0	0	1	14.4
R102BY999SD	DISTURBED SITES	102B	935	94	604	0	0	1	64.5
R102BY010SD	LOAMY	102B	891,886	89,189	123,352	0	0	1	13.8
R102BY009SD	SANDY	102B	3,398	340	1,481	0	0	1	43.6
R102BY014SD	SHALLOW TO GRAVEL	102B	21,085	2,108	8,456	0	0	1	40.1
R102BY012SD	THIN UPLAND	102B	102,786	10,279	16,061	0	0	1	15.6
R102BY016SD	VERY SHALLOW	102B	2,793	279	513	0	0	1	18.4
R102BY011SD	CLAYEY	102C	18,843	1,884	4,625	0	0	1	24.5
R102CY999SD	DISTURBED SITES	102C	1,221	122	947	0	0	1	77.5
R102BY010SD	LOAMY	102C	509,438	50,944	161,148	0	0	1	31.6
R102BY008SD	SANDS	102C	8,426	843	6,252	0	0	1	74.2
R102BY009SD	SANDY	102C	16,130	1,613	9,017	0	0	1	55.9
R102BY014SD	SHALLOW TO GRAVEL	102C	3,645	365	1,962	0	0	1	53.8
R102BY012SD	THIN UPLAND	102C	78,007	7,801	19,997	0	0	1	25.6

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R102BY016SD	VERY SHALLOW	102C	466	47	445	0	0	1	95.6
R053BY001ND	CLAYEY	53B	267,166	26,717	103,851	0	0	1	38.9
R053BY002ND	CLAYPAN	53B	34,177	3,418	14,890	0	0	1	43.6
R053BY999ND	DISTURBED SITES	53B	2,061	206	658	0	0	1	31.9
R053BY011ND	LOAMY	53B	1,866,635	101,018	1,006,236	0	0	1	53.9
R053BY007ND	SANDS	53B	19,954	1,995	4,614	0	0	1	23.1
R053BY008ND	SANDY	53B	40,712	4,071	11,530	0	0	1	28.3
R053BY026ND	SANDY CLAYPAN	53B	7,892	789	4,131	0	0	1	52.3
R053BY010ND	SHALLOW TO GRAVEL	53B	85,594	8,559	38,020	0	0	1	44.4
R053BY013ND	THIN CLAYPAN	53B	11,117	1,112	2,567	0	0	1	23.1
R053BY015ND	THIN UPLAND	53B	32,737	3,274	12,304	0	0	1	37.6
R053BY017ND	VERY SHALLOW	53B	53,650	5,365	34,155	0	0	1	63.7
R053CY011SD	CLAYEY	53C	382,159	38,216	53,612	0	0	1	14.0
R053CY018SD	DENSE CLAY	53C	3,557	356	1,148	0	0	1	32.3
R053CY999SD	DISTURBED SITES	53C	1,008	101	241	0	0	1	24.0
R053CY010SD	LOAMY	53C	1,390,165	139,016	228,624	0	0	1	16.4
R053CY999SD	ROCK OUTCROP	53C	36	4	35	0	0	1	98.1
R053CY014SD	SHALLOW TO GRAVEL	53C	19,054	1,905	4,230	0	0	1	22.2
R053CY015SD	THIN CLAYPAN	53C	19,502	1,950	2,512	0	0	1	12.9
R053CY012SD	THIN UPLAND	53C	252,286	25,229	85,068	0	0	1	33.7
R053CY016SD	VERY SHALLOW	53C	16,857	1,686	5,064	0	0	1	30.0
R054XY999ND	BADLANDS	54	11,595	1,159	8,728	0	0	1	75.3
R054XY020ND	CLAYEY	54	691,448	69,145	83,144	0	0	1	12.0
R054XY021ND	CLAYPAN	54	262,008	26,201	76,166	0	0	1	29.1
R062XY043SD	COOL SLOPES	54	794	79	776	0	0	1	97.8
R054XY999ND	DISTURBED SITES	54	2,401	240	897	0	0	1	37.3
R054XY031ND	LOAMY	54	1,556,992	155,699	275,896	0	0	1	17.7
R054XY999ND	ROCK OUTCROP	54	30,018	3,002	21,269	0	0	1	70.9

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R054XY025ND	SANDS	54	54,910	5,491	40,491	0	0	1	73.7
R054XY026ND	SANDY	54	859,343	85,934	302,648	0	0	1	35.2
R054XY027ND	SANDY CLAYPAN	54	48,321	4,832	20,218	0	0	1	41.8
R054XY028ND	SHALLOW CLAY	54	86,544	8,654	17,887	0	0	1	20.7
R054XY030ND	SHALLOW LOAMY	54	456,985	45,698	153,087	0	0	1	33.5
R054XY043ND	SHALLOW SANDY	54	333,389	33,339	139,931	0	0	1	42.0
R058DY029SD	STONY HILLS	54	1,473	147	1,473	0	0	1	100.0
R054XY033ND	THIN CLAYPAN	54	1,161,529	116,153	498,245	0	0	1	42.9
R054XY038ND	THIN UPLAND	54	201,049	20,105	42,315	0	0	1	21.0
R054XY035ND	VERY SHALLOW	54	32,961	3,296	14,716	0	0	1	44.6
R055BY056ND	CLAYEY	55B	372,507	37,251	60,249	0	0	1	16.2
R055BY057ND	CLAYPAN	55B	120,027	12,003	22,445	0	0	1	18.7
R055BY064ND	LOAMY	55B	996,175	99,617	225,672	0	0	1	22.7
R055BY061ND	SANDS	55B	22,754	2,275	8,744	0	0	1	38.4
R055BY062ND	SANDY	55B	55,327	5,533	23,601	0	0	1	42.7
R055BY072ND	SANDY CLAYPAN	55B	1,273	127	446	0	0	1	35.0
R055BY999ND	SLICKSPOTS	55B	90	9	59	0	0	1	65.5
R055BY066ND	THIN CLAYPAN	55B	77,154	7,715	11,777	0	0	1	15.3
R055BY068ND	THIN UPLAND	55B	29,013	2,901	6,594	0	0	1	22.7
R055CY011SD	CLAYEY	55C	352,830	35,283	61,312	0	0	1	17.4
R055CY013SD	CLAYPAN	55C	204,761	20,476	29,208	0	0	1	14.3
R055CY999SD	DISTURBED SITES	55C	3,465	347	1,050	0	0	1	30.3
R055CY010SD	LOAMY	55C	4,265,047	426,505	743,357	0	0	1	17.4
R055CY999SD	ROCK OUTCROP	55C	315	32	313	0	0	1	99.3
R055CY008SD	SANDS	55C	1,607	161	1,532	0	0	1	95.3
R055CY009SD	SANDY	55C	175,708	17,571	40,499	0	0	1	23.0
R055CY017SD	SHALLOW CLAY	55C	6,270	627	1,010	0	0	1	16.1
R055CY014SD	SHALLOW TO GRAVEL	55C	65,835	6,583	11,937	0	0	1	18.1

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R055CY015SD	THIN CLAYPAN	55C	20,530	2,053	2,613	0	0	1	12.7
R055CY012SD	THIN UPLAND	55C	368,979	36,898	107,066	0	0	1	29.0
R055CY016SD	VERY SHALLOW	55C	8,645	865	1,918	0	0	1	22.2
R102AY008SD	SANDS	56	90	9	25	0	0	1	27.8
R058DY999SD	BADLANDS	58D	14,079	1,408	10,111	0	0	1	71.8
R058DY011SD	CLAYEY	58D	11,745	1,175	8,432	0	0	1	71.8
R058DY013SD	CLAYPAN	58D	187,402	18,740	94,491	0	0	1	50.4
R062XY043SD	COOL SLOPES	58D	12,043	1,204	8,898	0	0	1	73.9
R058DY999SD	DISTURBED SITES	58D	149	15	79	0	0	1	52.9
R058DY010SD	LOAMY	58D	96,814	9,681	47,464	0	0	1	49.0
R058DY999SD	ROCK OUTCROP	58D	12,377	1,238	10,317	0	0	1	83.4
R058DY008SD	SANDS	58D	89,730	8,973	59,959	0	0	1	66.8
R058DY009SD	SANDY	58D	320,020	32,002	168,068	0	0	1	52.5
R058DY027SD	SANDY CLAYPAN	58D	8,164	816	7,145	0	0	1	87.5
R058DY017SD	SHALLOW CLAY	58D	3,156	316	2,104	0	0	1	66.7
R058DY024SD	SHALLOW LOAMY	58D	105,625	10,562	57,714	0	0	1	54.6
R058DY028SD	SHALLOW SANDY	58D	25,490	2,549	19,942	0	0	1	78.2
R058DY999SD	SLICKSPOTS	58D	543	54	226	0	0	1	41.6
R058DY029SD	STONY HILLS	58D	13,004	1,300	11,884	0	0	1	91.4
R058DY015SD	THIN CLAYPAN	58D	170,210	17,021	90,938	0	0	1	53.4
R058DY012SD	THIN UPLAND	58D	9,747	975	5,772	0	0	1	59.2
R058DY016SD	VERY SHALLOW	58D	5,494	549	2,261	0	0	1	41.2
R060AY999ND	BADLANDS	60A	10,321	1,032	7,249	0	0	1	70.2
R060AY011SD	CLAYEY	60A	812,170	81,217	316,325	0	0	1	38.9
R060AY040SD	CLAYEY	60A	228,525	22,853	78,376	0	0	1	34.3
R060AY013SD	CLAYPAN	60A	25,214	2,521	4,934	0	0	1	19.6
R062XY043SD	COOL SLOPES	60A	589	59	332	0	0	1	56.5
R060AY018SD	DENSE CLAY	60A	424,018	42,402	251,670	0	0	1	59.4

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R060AY999SD	DISTURBED SITES	60A	4,526	453	3,301	0	0	1	72.9
R060AY010SD	LOAMY	60A	437,800	43,780	75,823	0	0	1	17.3
R060AY041SD	LOAMY	60A	295,089	29,509	79,949	0	0	1	27.1
R060AY030SD	POROUS CLAY	60A	2,623	262	995	0	0	1	37.9
R060AY999SD	ROCK OUTCROP	60A	33,738	3,374	18,016	0	0	1	53.4
R060AY026SD	SALINE UPLAND	60A	38,136	3,814	11,617	0	0	1	30.5
R060AY008SD	SANDS	60A	79,390	7,939	53,169	0	0	1	67.0
R060AY009SD	SANDY	60A	69,125	6,912	35,352	0	0	1	51.1
R058DY027SD	SANDY CLAYPAN	60A	299	30	229	0	0	1	76.4
R060AY031SD	SAVANNAH	60A	14,687	1,469	3,959	0	0	1	27.0
R063AY024SD	SHALLOW	60A	9,592	959	5,621	0	0	1	58.6
R060AY017SD	SHALLOW CLAY	60A	498,409	49,841	285,471	0	0	1	57.3
R060AY025SD	SHALLOW DENSE CLAY	60A	309,132	30,913	170,815	0	0	1	55.3
R060AY024SD	SHALLOW LOAMY	60A	118,295	11,830	50,448	0	0	1	42.6
R060AY017SD	SHALLOW POROUS CLAY	60A	34,955	3,495	11,016	0	0	1	31.5
R062XY041SD	SHALLOW RIDGE	60A	2,158	216	686	0	0	1	31.8
R060AY044SD	SHALLOW SANDY	60A	2,459	246	1,559	0	0	1	63.4
R062XY039SD	SILTY FOOTSLOPES	60A	1,209	121	219	0	0	1	18.1
R060AY999SD	SLICKSPOTS	60A	64,414	6,441	40,566	0	0	1	63.0
R060AY015SD	THIN CLAYPAN	60A	257,516	25,752	96,723	0	0	1	37.6
R060AY012SD	THIN UPLAND	60A	269,339	26,934	69,136	0	0	1	25.7
R060AY016SD	VERY SHALLOW	60A	34,935	3,493	18,383	0	0	1	52.6
R062XY044SD	WARM SLOPES	60A	2,913	291	2,628	0	0	1	90.2
R061XN011SD	CLAYEY	61	21,795	2,179	9,902	0	0	1	45.4
R062XY043SD	COOL SLOPES	61	2,777	278	424	0	0	1	15.2
R061XY999SD	DISTURBED SITES	61	1,568	157	1,438	0	0	1	91.7
R061XN010SD	LOAMY	61	107,184	10,718	71,027	0	0	1	66.3
R061XY999SD	ROCK OUTCROP	61	5,389	539	3,430	0	0	1	63.7

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R060AY008SD	SANDS	61	1,328	133	1,159	0	0	1	87.3
R061XY009SD	SANDY	61	2,070	207	1,440	0	0	1	69.6
R062XY038SD	SAVANNAH	61	801	80	136	0	0	1	16.9
R061XS017SD	SHALLOW CLAY	61	6,373	637	3,474	0	0	1	54.5
R061XN024SD	SHALLOW LOAMY	61	97,036	9,704	72,974	0	0	1	75.2
R061XS024SD	SHALLOW LOAMY	61	15,792	1,579	12,427	0	0	1	78.7
R062XY041SD	SHALLOW RIDGE	61	59,361	5,936	49,325	0	0	1	83.1
R062XY039SD	SILTY FOOTSLOPES	61	14,886	1,489	8,453	0	0	1	56.8
R061XN029SD	STONY HILLS	61	12,424	1,242	6,033	0	0	1	48.6
R060AY015SD	THIN CLAYPAN	61	360	36	146	0	0	1	40.5
R061XN012SD	THIN UPLAND	61	68,186	6,819	45,051	0	0	1	66.1
R061XY016SD	VERY SHALLOW	61	6,182	618	4,556	0	0	1	73.7
R062XY044SD	WARM SLOPES	61	90,524	9,052	79,329	0	0	1	87.6
R061XN011SD	CLAYEY	62	1,677	168	1,263	0	0	1	75.3
R062XY043SD	COOL SLOPES	62	166,336	16,634	164,250	0	0	1	98.7
R062XY999SD	DISTURBED SITES	62	3,821	382	3,677	0	0	1	96.2
R062XY033SD	HIGH COUNTRY LOAMY	62	7,043	704	6,687	0	0	1	95.0
R062XY035SD	HIGH COUNTRY OVERFLOW	62	186,042	18,604	184,399	0	0	1	99.1
R062XY010SD	LOAMY	62	28,811	2,881	26,191	0	0	1	90.9
R062XY032SD	MOUNTAIN PRAIRIE	62	21,519	2,152	20,527	0	0	1	95.4
R062XY999SD	ROCK OUTCROP	62	940	94	939	0	0	1	99.9
R062XY040SD	ROCKY SIDESLOPES	62	283,584	28,358	281,244	0	0	1	99.2
R062XY038SD	SAVANNAH	62	6,664	666	6,664	0	0	1	100.0
R062XY024SD	SHALLOW	62	47,147	4,715	40,180	0	0	1	85.2
R061XN024SD	SHALLOW LOAMY	62	2,821	282	2,028	0	0	1	71.9
R062XY041SD	SHALLOW RIDGE	62	134,919	13,492	128,101	0	0	1	94.9
R062XY029SD	STONY HILLS	62	31,213	3,121	27,172	0	0	1	87.1

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R061XN012SD	THIN UPLAND	62	4,312	431	3,661	0	0	1	84.9
R061XY016SD	VERY SHALLOW	62	1,019	102	893	0	0	1	87.6
R062XY044SD	WARM SLOPES	62	413,721	41,372	395,539	0	0	1	95.6
R063AY999SD	BADLANDS	63A	1,993	199	1,250	0	0	1	62.7
R063AY011SD	CLAYEY	63A	2,508,227	250,823	393,639	0	0	1	15.7
R063AY013SD	CLAYPAN	63A	40,720	4,072	13,675	0	0	1	33.6
R063AY018SD	DENSE CLAY	63A	402,987	40,299	138,347	0	0	1	34.3
R063AY999SD	DISTURBED SITES	63A	3,569	357	2,993	0	0	1	83.8
R063AY010SD	LOAMY	63A	414,663	41,466	118,709	0	0	1	28.6
R063AY999SD	ROCK OUTCROP	63A	25,723	2,572	14,747	0	0	1	57.3
R063AY008SD	SANDS	63A	18,421	1,842	16,878	0	0	1	91.6
R063AY009SD	SANDY	63A	25,112	2,511	15,706	0	0	1	62.5
R063AY024SD	SHALLOW	63A	41,147	4,115	13,930	0	0	1	33.9
R063AY017SD	SHALLOW CLAY	63A	1,617,071	161,707	691,556	0	0	1	42.8
R063AY014SD	SHALLOW TO GRAVEL	63A	5,442	544	1,142	0	0	1	21.0
R063AY999SD	SLICKSPOTS	63A	846	85	530	0	0	1	62.7
R063AY015SD	THIN CLAYPAN	63A	167,615	16,761	41,482	0	0	1	24.7
R063AY012SD	THIN UPLAND	63A	453,997	45,400	124,328	0	0	1	27.4
R063AY016SD	VERY SHALLOW	63A	87,386	8,739	42,462	0	0	1	48.6
R063BY999NE	BADLANDS	63B	56	6	18	0	0	1	33.0
R065XY034NE	CHOPPY SANDS	63B	1,040	104	328	0	0	1	31.6
R063BY011SD	CLAYEY	63B	841,136	84,114	89,662	0	0	1	10.7
R063BY018SD	DENSE CLAY	63B	60,532	6,053	26,203	0	0	1	43.3
R063BY999SD	DISTURBED SITES	63B	1,872	187	1,453	0	0	1	77.6
R063BY010SD	LOAMY	63B	244,186	24,419	68,255	0	0	1	28.0
R063BY999SD	ROCK OUTCROP	63B	12,346	1,235	10,817	0	0	1	87.6
R066XY033NE	SANDS	63B	8,445	845	3,815	0	0	1	45.2
R066XY055NE	SANDS	63B	2,540	254	2,514	0	0	1	99.0

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R066XY054NE	SANDY	63B	33,686	3,369	18,324	0	0	1	54.4
R066XY032NE	SANDY	63B	6,260	626	3,858	0	0	1	61.6
R063BY024SD	SHALLOW	63B	18,438	1,844	3,942	0	0	1	21.4
R063BY017SD	SHALLOW CLAY	63B	493,430	49,343	221,816	0	0	1	45.0
R066XY040NE	SHALLOW LIMY	63B	234	23	34	0	0	1	14.6
R063AY014SD	SHALLOW TO GRAVEL	63B	12,894	1,289	1,961	0	0	1	15.2
R063BY015SD	THIN CLAYPAN	63B	35,217	3,522	4,693	0	0	1	13.3
R063BY012SD	THIN UPLAND	63B	195,527	19,553	31,094	0	0	1	15.9
R063BY016SD	VERY SHALLOW	63B	19,434	1,943	8,330	0	0	1	42.9
R064XY999NE	BADLANDS	64	344,627	34,463	253,912	0	0	1	73.7
R064XY035NE	CLAYEY	64	183,018	18,302	74,875	0	0	1	40.9
R064XY014NE	CLAYEY	64	43,538	4,354	19,885	0	0	1	45.7
R064XY044NE	CLAYPAN	64	89,290	8,929	35,737	0	0	1	40.0
R064XY045NE	DENSE CLAY	64	48,220	4,822	40,255	0	0	1	83.5
R064XY999NE	DISTURBED SITES	64	87	9	32	0	0	1	36.3
R064XY036NE	LOAMY	64	997,903	99,790	261,827	0	0	1	26.2
R064XY015NE	LOAMY	64	36,598	3,660	18,369	0	0	1	50.2
R064XY012NE	SANDS	64	75,657	7,566	34,488	0	0	1	45.6
R064XY032NE	SANDY	64	193,478	19,348	82,797	0	0	1	42.8
R064XY011NE	SANDY	64	10,745	1,074	6,472	0	0	1	60.2
R064XY040NE	SHALLOW	64	548,968	54,897	103,473	0	0	1	18.8
R064XY039NE	SHALLOW CLAY	64	117,507	11,751	89,784	0	0	1	76.4
R066XY040NE	SHALLOW LIMY	64	5,479	548	2,150	0	0	1	39.2
R064XY046NE	THIN CLAYPAN	64	69,575	6,957	38,889	0	0	1	55.9
R064XY037NE	THIN UPLAND	64	68,550	6,855	33,135	0	0	1	48.3
R064XY047NE	VERY SHALLOW	64	25,790	2,579	12,731	0	0	1	49.4
R065XY034NE	CHOPPY SANDS	65	13,540	1,354	7,643	0	0	1	56.5
R064XY044NE	CLAYPAN	65	461	46	83	0	0	1	18.0

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R065XY033NE	SANDS	65	233,065	23,307	146,713	0	0	1	62.9
R065XY032NE	SANDY	65	11,382	1,138	4,133	0	0	1	36.3
R065XY054NE	SANDY	65	539	54	438	0	0	1	81.2
R066XY040NE	SHALLOW LIMY	65	895	89	890	0	0	1	99.5
R065XY034NE	CHOPPY SANDS	66	747	75	635	0	0	1	85.1
R066XY999NE	DISTURBED SITES	66	281	28	41	0	0	1	14.7
R066XY033NE	SANDS	66	263,652	26,365	100,410	0	0	1	38.1
R066XY032NE	SANDY	66	368,211	36,821	106,084	0	0	1	28.8
R066XY054NE	SANDY	66	297,623	29,762	30,978	0	0	1	10.4
R063BY024SD	SHALLOW	66	9,949	995	1,620	0	0	1	16.3
R066XY040NE	SHALLOW LIMY	66	63,376	6,338	24,072	0	0	1	38.0
R063BY015SD	THIN CLAYPAN	66	5,665	566	951	0	0	1	16.8
R066XY059NE	THIN UPLAND	66	30,975	3,097	4,344	0	0	1	14.0
R053CY013SD	CLAYPAN	53C	64,469	6,447	5,437	21,833	0	2	42.3
R053CY009SD	SANDY	53C	1,256	126	2	329	0	2	26.3
R054XY999ND	SLICKSPOTS	54	99	10	9	7	0	2	16.1
R055BY999ND	DISTURBED SITES	55B	1,753	175	161	351	0	2	29.2
R055BY073ND	SHALLOW LOAMY	55B	1,394	139	0	369	0	2	26.5
R055BY063ND	SHALLOW TO GRAVEL	55B	12,140	1,214	751	2,546	0	2	27.2
R055BY069ND	VERY SHALLOW	55B	744	74	27	122	0	2	20.0
R102AY011SD	CLAYEY	56	4,828	483	0	3,346	0	2	69.3
R102AY010SD	LOAMY	56	4,685	469	0	2,779	0	2	59.3
R102AY009SD	SANDY	56	2,216	222	14	783	0	2	36.0
R102AY014SD	SHALLOW TO GRAVEL	56	1,265	126	8	549	0	2	44.0
R102AY012SD	THIN UPLAND	56	537	54	5	130	0	2	25.1
R062XY029SD	STONY HILLS	60A	154	15	0	24	0	2	15.6
R063BY013SD	CLAYPAN	63B	39,522	3,952	2,858	5,897	0	2	22.2
R060AY024SD	SHALLOW LOAMY	64	1,605	160	141	960	0	2	68.6

South Dakota Wildlife Action Plan

Appendix R (continued). Terrestrial conservation opportunity acreages by ecosite type using 10% representation goal.

R063AY014SD	SHALLOW TO GRAVEL	64	1,936	194	189	662	0	2	44.0
R063BY011SD	CLAYEY	66	84,887	8,489	2,886	29,354	0	2	38.0
R063BY013SD	CLAYPAN	66	30,968	3,097	3,066	7,749	0	2	34.9
R066XY036NE	LOAMY	66	217,181	21,718	15,907	61,606	0	2	35.7
R066XY058NE	LOAMY	66	57,927	5,793	2,169	11,795	0	2	24.1
R063BY017SD	SHALLOW CLAY	66	9,976	998	482	2,508	0	2	30.0
R066XY062NE	SHALLOW TO GRAVEL	66	27,744	2,774	2,192	4,186	0	2	23.0
R064XY036NE	LOAMY	65	1,359	136	35	0	1,226	3	92.8
R064XY040NE	SHALLOW	65	599	60	2	0	596	3	100.0
R064XY046NE	THIN CLAYPAN	65	1,026	103	2	13	1,002	3	99.1
R064XY047NE	VERY SHALLOW	66	448	45	15	15	416	3	99.7

South Dakota Wildlife Action Plan

Appendix S. Existing federal, state and private programs to assist collaborative efforts and individual landowners in maintaining and restoring ecosystem diversity in South Dakota.

FEDERAL PROGRAMS

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

*Funding for some of these programs is provided through the federal Farm Bill and is not guaranteed on a long term basis.

Agricultural Conservation Easement Program (ACEP) - A voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands and protect grasslands and working farms and ranches on their property. The NRCS provides technical and financial assistance to eligible landowners. Landowners have the opportunity of enrolling eligible lands through permanent or 30-year easements. The program is offered on a continuous sign-up basis and is available Statewide. This program offers landowners an opportunity to establish, at minimal cost, long-term conservation and wildlife habitat enhancement practices and protection.

Conservation Reserve Program (CRP) and Continuous Conservation Reserve Program (CCRP) - Provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation (CCC). CRP is administered by the Farm Service Agency, with NRCS providing technical land eligibility determinations, conservation planning and practice implementation. The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices.

Environmental Quality Incentives Program (EQIP) - Provides a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible goals. EQIP offers financial and technical assistance for eligible farmers and ranchers to install or implement structural and land management practices on eligible agricultural land. Any farmer or rancher who is engaged in livestock or agricultural production on eligible land may participate in the EQIP program. EQIP may provide cost-share for implementing certain conservation practices important to improving and maintaining the health of South Dakota's natural resources. A minimum of 5% of EQIP funds must be expended on wildlife habitat.

South Dakota Wildlife Action Plan

Appendix S (continued). Existing federal, state, and private programs to assist collaborative efforts and individual landowners in maintaining and restoring ecosystem diversity in South Dakota.

Conservation Security Programs (CSP) - A voluntary program that provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on Tribal and private working lands. Working lands include cropland, grassland, prairie land, improved pasture, and range land, as well as forested land that is an incidental part of an agriculture operation. The program provides equitable access to benefits to all producers, regardless of size of operation, crops produced, or geographic location.

U.S. Department of Interior, Fish and Wildlife Service

North American Wetlands Conservation Act Grants Program - Established to support the long-term protection of wetlands and associated uplands habitats needed by waterfowl and other migratory birds in North America. Projects must support long-term wetlands acquisition, restoration, and/or enhancement.

Partners for Fish and Wildlife - Supports voluntary habitat conservation on private and Tribal land through public-private partnerships. Projects are typically designed to restore, enhance, or establish grassland and wetland habitats. A common thread through every South Dakota Partners project is the ability to be flexible and responsive enough to accommodate the site-specific needs and concerns of landowners. Since 1991, this approach has resulted in over 6,100 South Dakota landowners becoming valued Partners for Fish and Wildlife and the number of new landowner requests for assistance continues to accelerate.

Private Stewardship Program - Provides grants and other assistance on a competitive basis to individuals and groups for voluntary conservation efforts to benefit federally listed, proposed, or candidate species, or other at-risk species on private lands.

Cooperative Endangered Species Conservation Fund - Includes several programs including Conservation Grants, Recovery Land Acquisition, Habitat Conservation Planning Assistance, and Habitat Conservation Plan Land Acquisition. All aimed at protecting endangered, threatened, proposed, or candidate species.

Landowner Incentive Program (LIP) - funded through the State of South Dakota

Habitat Fence Construction - This practice is provided to protect certain high quality and normally high expense habitat practices from livestock damage. Although most practices—even expensive ones—normally will not require fencing, occasionally practices are designed in such a way that require some type of protection. In those cases, the department may provide cost share to help the participating landowner in providing the needed protection.

Native Warm Season Grass Establishment - This project will establish NWSG for wildlife by seeding or inter-seeding to provide high quality roosting and escape cover for birds, especially in months with heavy snow-cover. It will also provide cover for ground nesting birds, provide broodrearing cover for ground-nesting birds, and provide grassland habitat for various wildlife species.

South Dakota Wildlife Action Plan

Appendix S (continued). Existing federal, state, and private programs to assist collaborative efforts and individual landowners in maintaining and restoring ecosystem diversity in South Dakota.

U.S. Department of Agriculture, Forest Service

Forest Legacy Program (FLP) - A federal program in partnership with states; supports state efforts to protect environmentally sensitive forest lands. Designed to encourage the protection of privately owned forest lands, FLP is an entirely voluntary program. To maximize the public benefits it achieves, the program focuses on the acquisition of partial interests in privately owned forest lands.

Forest Stewardship Program (FSP) - Provide technical assistance, through state forestry agencies, to non-industrial private forest owners to encourage and enable active long-term forest management to provide timber, wildlife habitat, watershed protection, recreational opportunities and many other benefits for landowners and society, both now and in the future.

STATE OF SOUTH DAKOTA PROGRAMS

South Dakota Department of Game, Fish and Parks, Division of Wildlife

Wetland and Grassland Habitat Program – This program implements conservation practices on private land that benefit breeding waterfowl and other wetland or grassland dependent wildlife by assisting landowners with projects on working grasslands. Practices eligible for technical assistance and project cost share include:

- Wetland Restorations
- Wetland Creations & Enhancements
- Water Development
- Grassland/Grazing Enhancements
- Riparian Pastures
- Wildlife Friendly Fences

Wildlife Partners Program – Voluntary program for private landowners interested in establishing habitat for wildlife by providing cost-share for habitat projects such as native grass establishment, woody cover plantings, and food plots. One of the goals of this program is to assist landowners with the establishment of woody habitat to enhance winter cover for game and nongame wildlife. Large woody plantings with appropriate shrubs and trees help ensure survival in the worst possible winter weather, afford vulnerable wildlife year-round protection from predators and provide important sources of food for a variety of wildlife.

For more information about these programs, visit: <http://gfp.sd.gov/wildlife/private-land/>

South Dakota Wildlife Action Plan

Appendix S (continued). Existing federal, state, and private programs to assist collaborative efforts and individual landowners in maintaining and restoring ecosystem diversity in South Dakota.

South Dakota Department of Agriculture

Coordinated Natural Resources Conservation Grant Fund - Grants are available for projects that show a natural resource conservation benefit to the state. Any organized conservation district within the state may make an application to the State Conservation Commission. These grants are competitive in nature and there is limited funding for these grants.

For more information about this program, visit: <http://sdda.sd.gov/grants/conservation-grant/>

South Dakota Department of Environment and Natural Resources, Watershed Protection

Section 319 Nonpoint Source Pollution (NPS) Project Grant - 319 grant funds may be used for watershed assessment, planning and project implementation, or for ground water, and information and education projects that control or prevent NPS pollution.

For more information about this program, visit: <http://denr.sd.gov/dfta/wp/wp.aspx>

PRIVATE PROGRAMS AND SOURCES

Ducks Unlimited – Often works closely with USFWS Partners for Fish and Wildlife Program and/or South Dakota Department of Game, Fish and Parks' Wetland and Grassland Program to provide technical assistance and cost-share for wetland and grassland enhancement projects on private land. Some cost share programs are designed to be applied with monies from existing federal programs. Also works with federal agencies to secure funding for waterfowl production habitat protection. For more information call: (701) 355-3500.

The South Dakota Grassland Coalition – A non-profit organization of individuals, private organizations, and local, state and federal entities that partners with people working to voluntarily improve grasslands for the long term needs of the resource, people and the environment. The Coalition is a major partner in the Grassland Management and Planning Project which assists landowners with grazing and ranch management planning.

For more detailed information, visit: <http://www.sdgrass.org/>

The Nature Conservancy

Prairie Coteau Habitat Partnership – This program provides services for prescribed fire planning and more natural grazing regimes for landowners in the Prairie Coteau region of South Dakota.

For more information, visit:

<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/southdakota/fire-management-on-private-lands.xml>

South Dakota Wildlife Action Plan

Appendix S (continued). Existing federal, state, and private programs to assist collaborative efforts and individual landowners in maintaining and restoring ecosystem diversity in South Dakota.

Rocky Mountain Elk Foundation

Permanent Land Protection - Through conservation easements and acquisitions, the Elk Foundation can forever protect crucial elk winter and summer ranges, migration corridors, calving grounds and other vital areas where habitat and wildlife are threatened by fragmentation and encroaching development.

Habitat Stewardship - Since healthy habitat is essential for healthy elk and other wildlife, the Elk Foundation helps fund and conduct a variety of projects to improve the essential forage, water, cover and space components of wildlife habitat. Restoring aspen communities, fighting the spread of noxious weed, and boosting rangeland productivity are just a few of the activities that we fund.

Conservation Education - Through outreach to young and old alike, the Elk Foundation is working to nurture a better understanding of the role people play in conserving elk, other wildlife and their habitat.

Sand County Foundation

Leopold Stewardship Fund - Provides incentives for private landowners who improve habitat on their own land for imperiled species. The resources of the Leopold Stewardship Fund provide direct grants to landowners for securing professional assistance in planning and implementing scientifically sound conservation actions, for undertaking specific actions beneficial to imperiled species, and for complying with applicable legal and regulatory requirements. The Leopold Stewardship Fund will seek to reduce the need to place species on the federal endangered species list.

The Bradley Fund for the Environment - Intended to foster ethically sound and science-based environmental programs that are leading edge solutions to major problems. Proposals that emphasize private responsibility, create sustaining partnerships and integrate habitat improvement with human considerations are solicited by Sand County Foundation on behalf of the Bradley Foundation.

South Dakota Wildlife Action Plan

Appendix T. Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T1. Bad/Choteau Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

BAD/CHOTEAU						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Bull Creek	1,657,787	False Map Turtle	Game Production Areas	3.6	418	Dams Hydrologic Alterations
		Higgin's Eye	Parks and Recreation			
		Mapleleaf	School and Public Lands			
		Pallid Sturgeon	Bureau of Land Mgmt			
		Scaleshell	Corps of Engineers			
		Shovelnose Sturgeon	USFWS Refuge			
		Sicklefin Chub	Waterfowl Production Areas			
Cedar Creek	106,513	Blue Sucker	School and Public Lands	18.8	314	Minor to Moderate Stressors Only
		False Map Turtle	Corps of Engineers			
			Waterfowl Production Areas			
Choteau Creek	420,032	False Map Turtle	Game Production Areas	0.9	318	Minor to Moderate Stressors Only
		Higgin's Eye	Waterfowl Production Areas			
		Mapleleaf				
		Pallid Sturgeon				
		Scaleshell				
		Sicklefin Chub				
		Smooth Softshell				
Emanuel Creek	125,066	Blue Sucker	Game Production Areas	2.1	418	Road-Stream Crossings
		False Map Turtle	Waterfowl Production Areas			
		Higgin's Eye				
		Mapleleaf				
		Pallid Sturgeon				
		Scaleshell				
		Shovelnose Sturgeon				
		Sicklefin Chub				
		Smooth Softshell				
Ponca Creek	286,041	Northern Pearl Dace		0.1	416	Dams

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

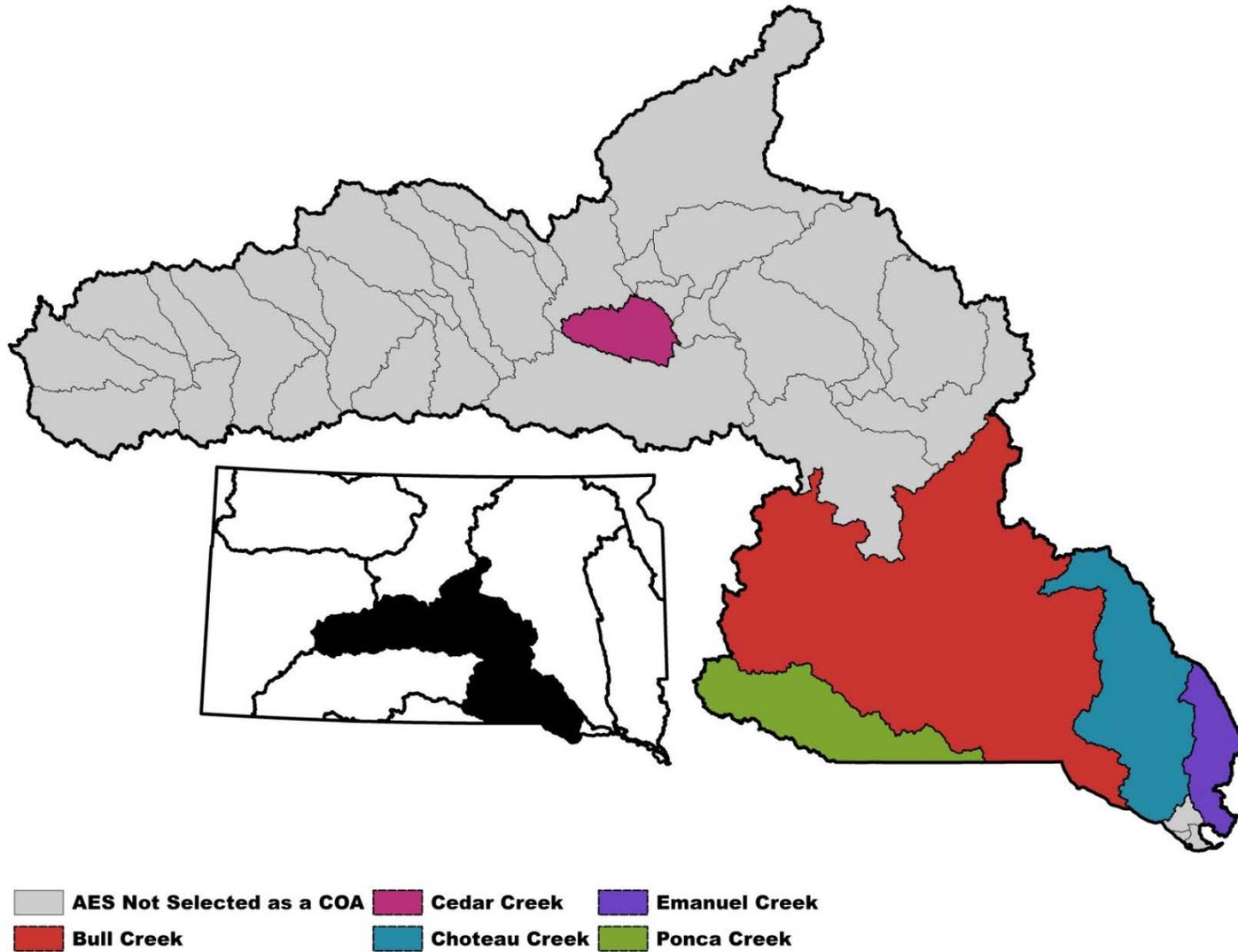


Figure T1. Bad/Choteau Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T2. Big Sioux/Vermillion Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

BIG SIOUX/VERMILLION						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Big Sioux River	200,933	Creek Heelsplitter	Game Production Areas	3.4	317	Minor to Moderate Stressors Only
		Elktoe	Parks and Recreation			
		Logperch	Waterfowl Production Areas			
		Northern Redbelly Dace				
		Stonefly				
		Topeka Shiner				
		Trout-perch				
Brule Creek	72,296	Blackside Darter	Game Production Areas	0.3	418	Dams
		Creek Heelsplitter	Waterfowl Production Areas			
		Elktoe				
		False Map Turtle				
		Hickorynut				
		Logperch				
		Mapleleaf				
		Pimpleback				
		Smooth Softshell				
		Southern Redbelly Dace				
		Stonefly				
		Topeka Shiner				
		Trout-perch				
Yellow Sandshell						
East Brule Creek	135,394	Blackside Darter	Parks and Recreation	0.4	420	Landuse Road-Stream Crossings
		Blue Sucker				
		Creek Heelsplitter				
		Elktoe				

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T2 (continued). Big Sioux/Vermillion Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

BIG SIOUX/VERMILLION (continued)

COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
East Brule Creek (continued)		Hickorynut Logperch Mapleleaf Southern Redbelly Dace Stonefly Topeka Shiner Trout-perch Yellow Sandshell				
Pattee Creek	215,741	Blackside Darter Creek Heelsplitter Elktoe Logperch Mapleleaf Pimpleback Southern Redbelly Dace Stonefly Topeka Shiner Trout-perch Yellow Sandshell	Game Production Areas Parks and Recreation Waterfowl Production Areas	1.9	418	Dams
Silver Creek	83,709	Blackside Darter Blue Sucker Creek Heelsplitter Elktoe Logperch Mapleleaf	Parks and Recreation	0.5	421	Impervious Surfaces Road-Stream Crossings

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T2 (continued). Big Sioux/Vermillion Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

Silver Creek (continued)	Pimpleback
	Southern Redbelly Dace
	Stonefly
	Topeka Shiner
	Trout-perch
	Yellow Sandshell

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

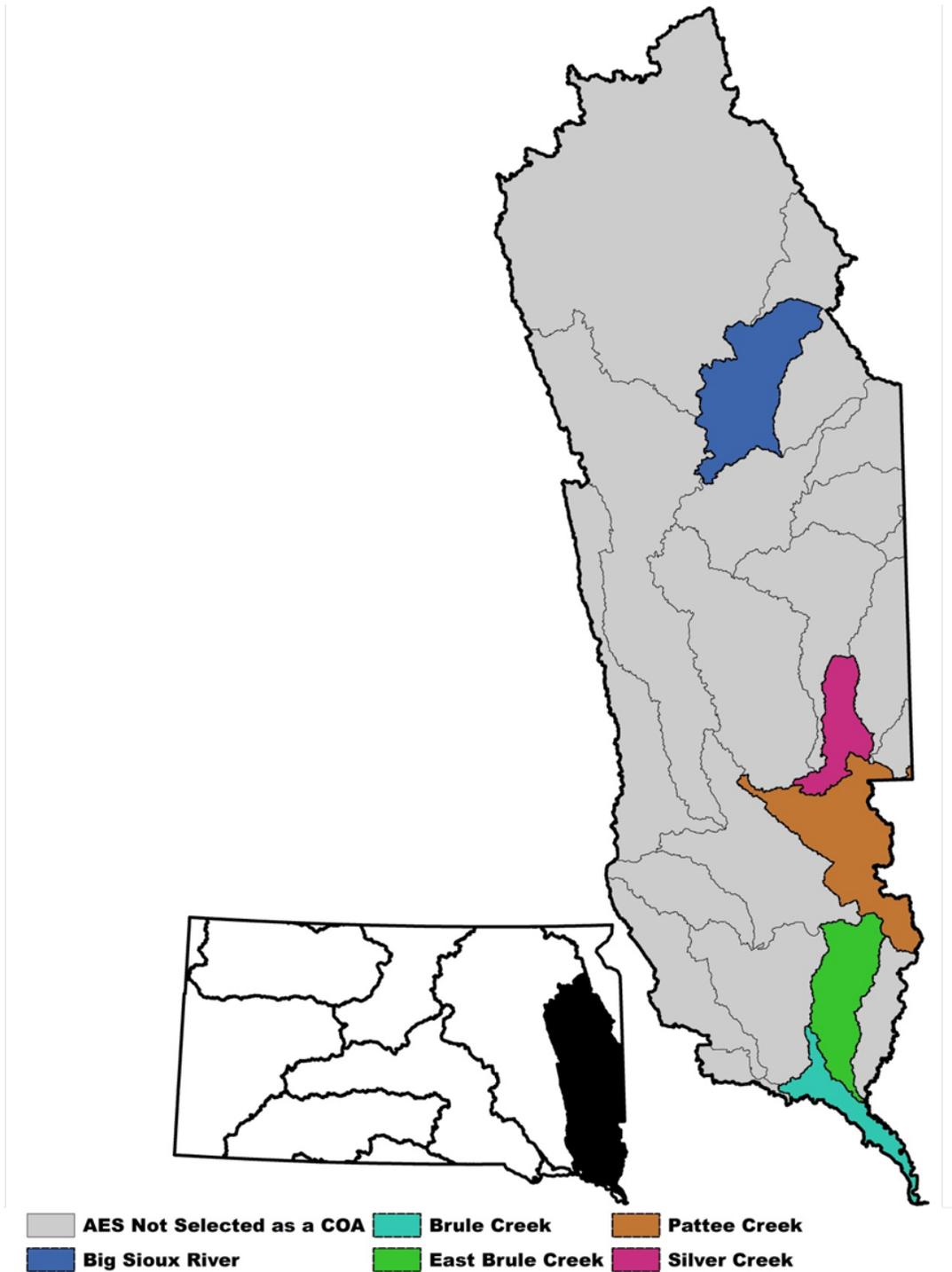


Figure T2. Big Sioux/Vermillion Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T3. Cheyenne Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

CHEYENNE						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Cherry Creek	16,632			0.0	210	Minor to Moderate Stressors Only
Cheyenne River	45,037	Finescale Dace Dot-winged Baskettail Mountain Sucker Stonefly Sturgeon Chub	School and Public Lands US Forest Service	44.2	210	Minor to Moderate Stressors Only
Cottonwood Springs Creek	104,452	Finescale Dace Dot-winged Baskettail Mountain Sucker Stonefly Sturgeon Chub	Game Production Areas Bureau of Land Mgmt US Forest Service National Park Service	34.1	415	Road-Stream Crossings
French Creek	172,409	Finescale Dace Dot-winged Baskettail Mountain Sucker Stonefly Sturgeon Chub	Parks and Recreation School and Public Lands US Forest Service	41.6	315	Minor to Moderate Stressors Only
Hat Creek	25,773		School and Public Lands US Forest Service	33.0	211	Minor to Moderate Stressors Only
Hay Creek	24,989	Finescale Dace Longnose Sucker Mountain Sucker	Bureau of Land Mgmt	0.3	313	Minor to Moderate Stressors Only
Indian Creek	89,486	Finescale Dace Dot-winged Baskettail Mountain Sucker Stonefly Sturgeon Chub	School and Public Lands Bureau of Land Mgmt US Forest Service National Park Service	58.4	210	Minor to Moderate Stressors Only

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T3 (continued). Cheyenne Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

CHEYENNE (continued)

COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Newton Fork	245,638	Finescale Dace	Game Production Areas	47.5	314	Minor to Moderate Stressors Only
		Dot-winged Baskettail	Parks and Recreation			
		Mountain Sucker	School and Public Lands			
		Stonefly	US Forest Service			
		Sturgeon Chub				
Rapid Creek	459,856	Lake Chub	School and Public Lands	52.8	416	Dams Road-Stream Crossings
		Longnose Sucker	Bureau of Land Mgmt			
		Mountain Sucker	US Forest Service			
Redwater Creek	76,562	Finescale Dace	Game Production Areas	48.7	313	Minor to Moderate Stressors Only
		Longnose Sucker	US Forest Service			
		Mountain Sucker				

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

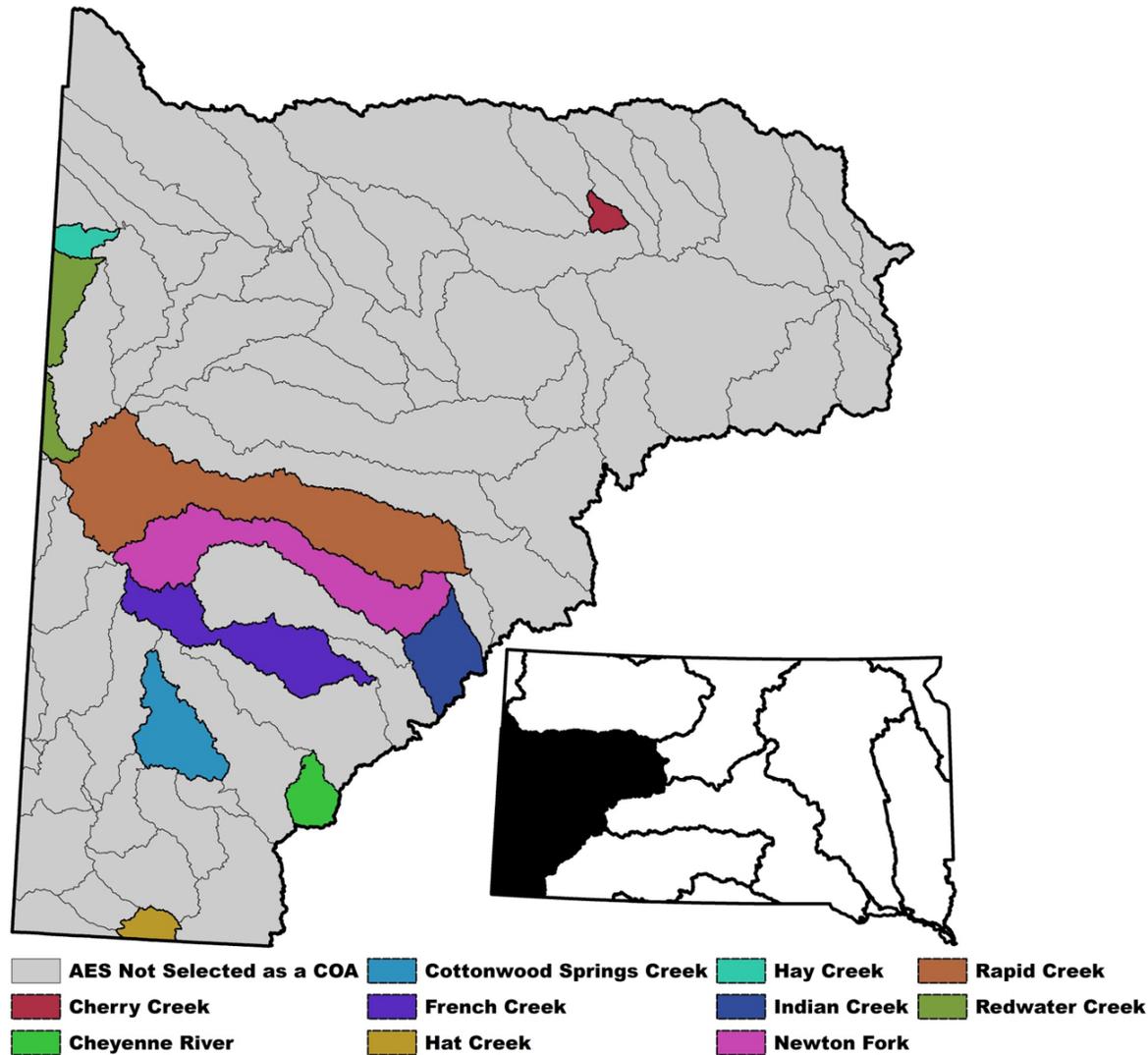


Figure T3. Cheyenne Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T4. Grand/Moreau Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

GRAND/MOREAU						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Fourmile Creek	56,735		School and Public Lands Bureau of Land Mgmt	40.0	210	Minor to Moderate Stressors Only
Grand River	461,643	False Map Turtle	School and Public Lands Corps of Engineers	2.2	416	Hydrologic Alterations
Little Moreau River	353,507		Game Production Areas Parks and Recreation School and Public Lands	1.2	413	Dams

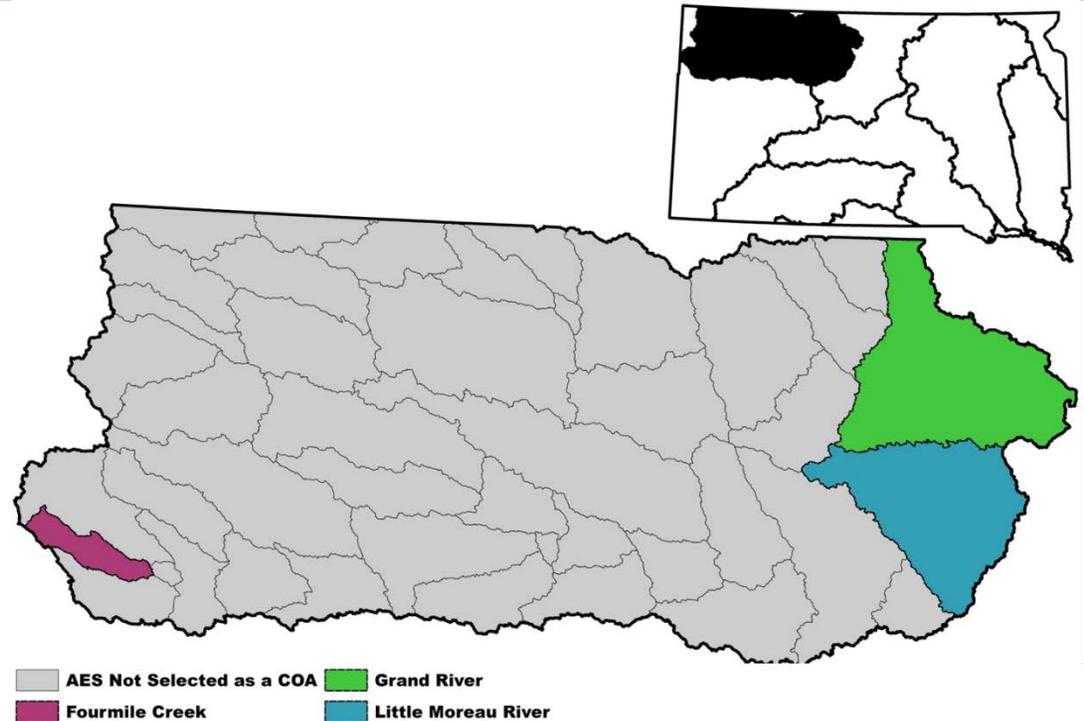


Figure T4. Grand/Moreau Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T5. Heart Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

HEART						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Roger Creek	58,092			2.5	212	Minor to Moderate Stressors Only

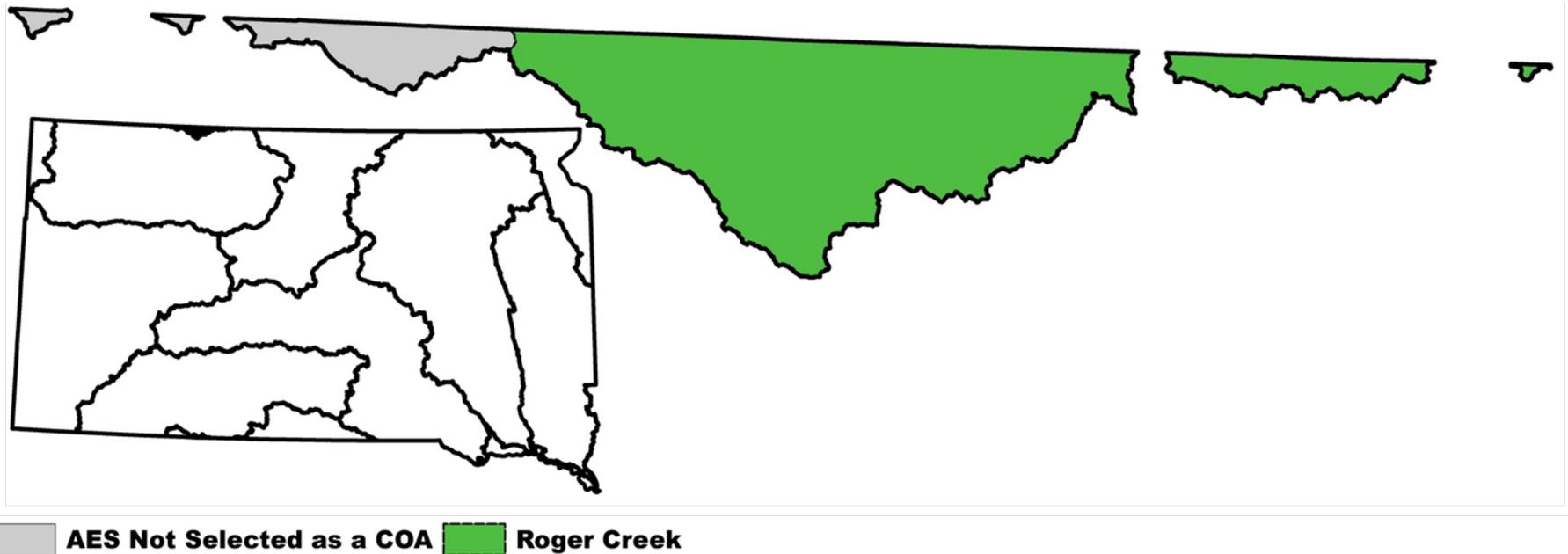


Figure T5. Heart Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T6. James Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

JAMES						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Beaver Creek	464,043	Blue Sucker Hickorynut Mapleleaf Pimpleback Rock Pocketbook Smooth Softshell Topeka Shiner Yellow Sandshell	Game Production Areas Waterfowl Production Areas	0.5	317	Minor to Moderate Stressors Only
Firesteel Creek	442,873	Blue Sucker Hickorynut Mapleleaf Pimpleback Rock Pocketbook Smooth Softshell Topeka Shiner Yellow Sandshell	Game Production Areas School and Public Lands Waterfowl Production Areas	1.6	215	Minor to Moderate Stressors Only
Wolf Creek	259,582	Blue Sucker Hickorynut Mapleleaf Pimpleback Rock Pocketbook Smooth Softshell Topeka Shiner Yellow Sandshell	Game Production Areas Waterfowl Production Areas	1.2	316	Minor to Moderate Stressors Only

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

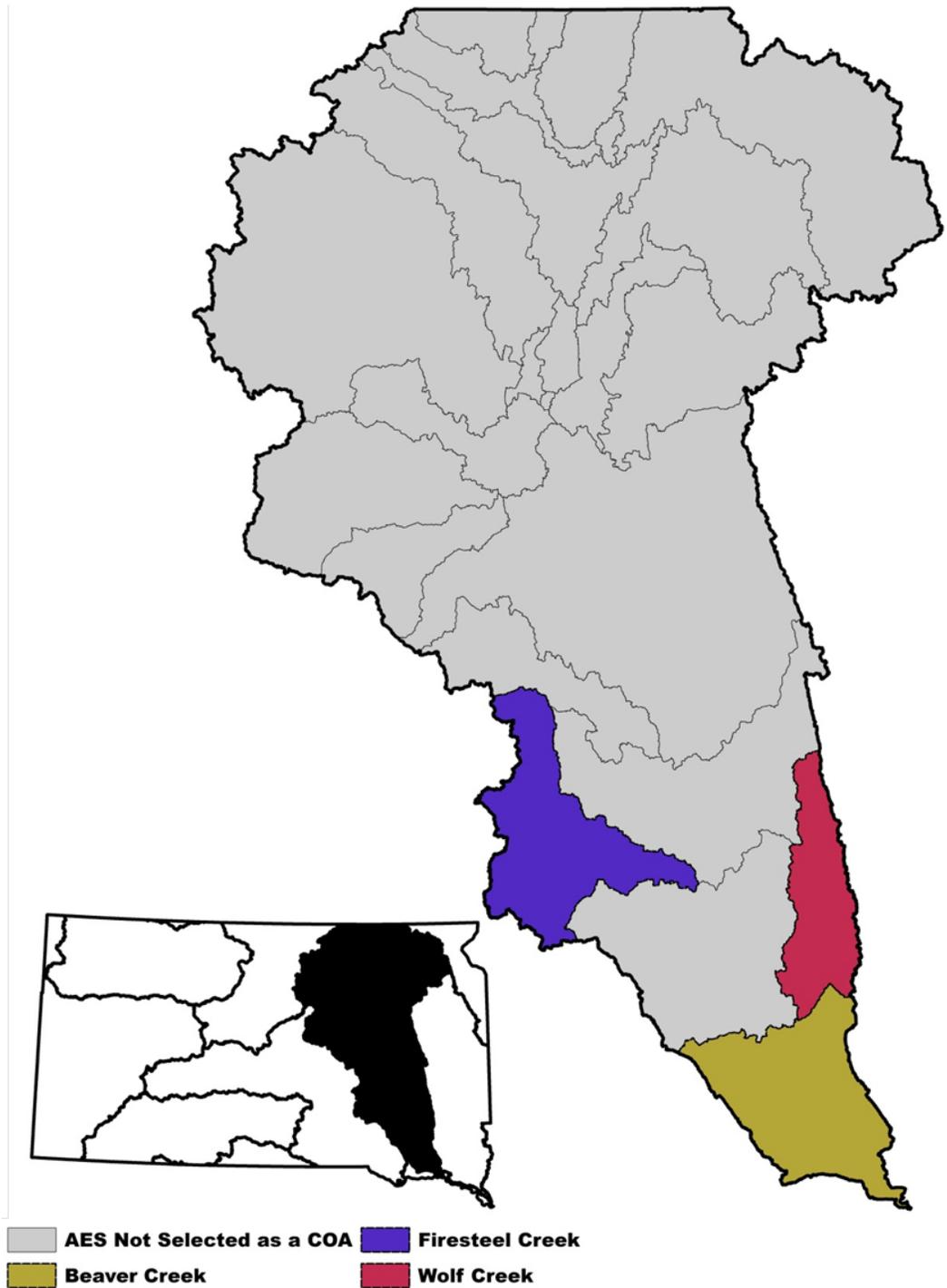


Figure T6. James Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T7. Little Missouri Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

LITTLE MISSOURI						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Boxelder Creek	18,596		School and Public Lands Bureau of Land Mgmt	9.7	413	Dams
Little Missouri River	317,939		Game Production Areas School and Public Lands Bureau of Land Mgmt US Forest Service	22.1	415	Dams

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

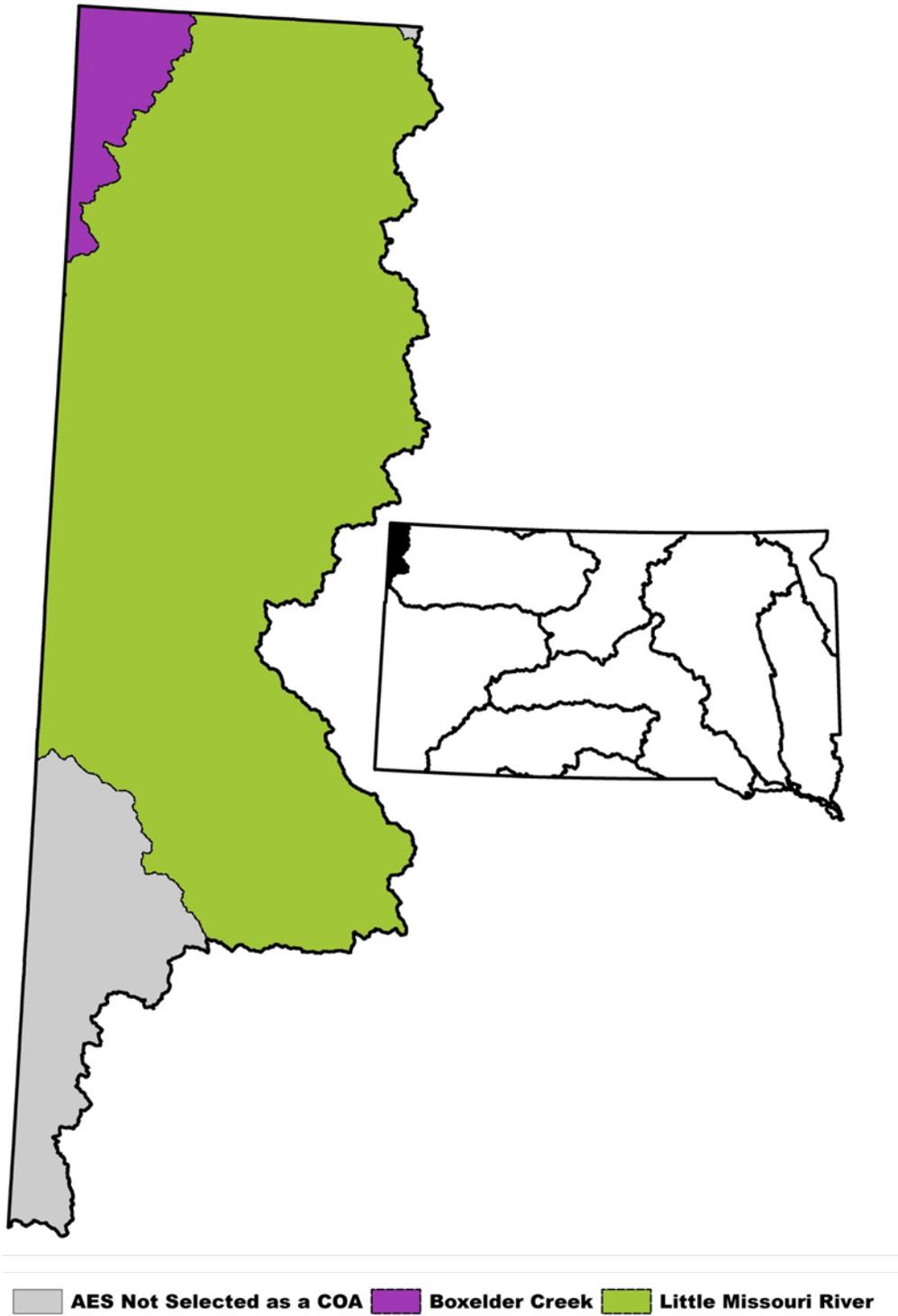


Figure T7. Little Missouri Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T8. Little Sioux/Nemaha Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

LITTLE SIOUX/NEMAHA						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Aowa Creek	24,738	False Map Turtle Higgin's Eye Mapleleaf Pallid Sturgeon Scaleshell Shovelnose Sturgeon Sicklefin Chub Smooth Softshell	Parks and Recreation	6.0	315	Minor to Moderate Stressors Only
Elk Creek	1	Blue Sucker Higgin's Eye Mapleleaf Scaleshell		0.0	316	Minor to Moderate Stressors Only
Missouri River	38,510	False Map Turtle Sicklefin Chub	Game Production Areas Waterfowl Production Areas	1.4	315	Minor to Moderate Stressors Only
Snatch Creek	150,363	False Map Turtle Higgin's Eye Mapleleaf Pallid Sturgeon Scaleshell Shovelnose Sturgeon Sicklefin Chub Smooth Softshell		1.8	420	Hydrologic Alterations Road-Stream Crossings

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

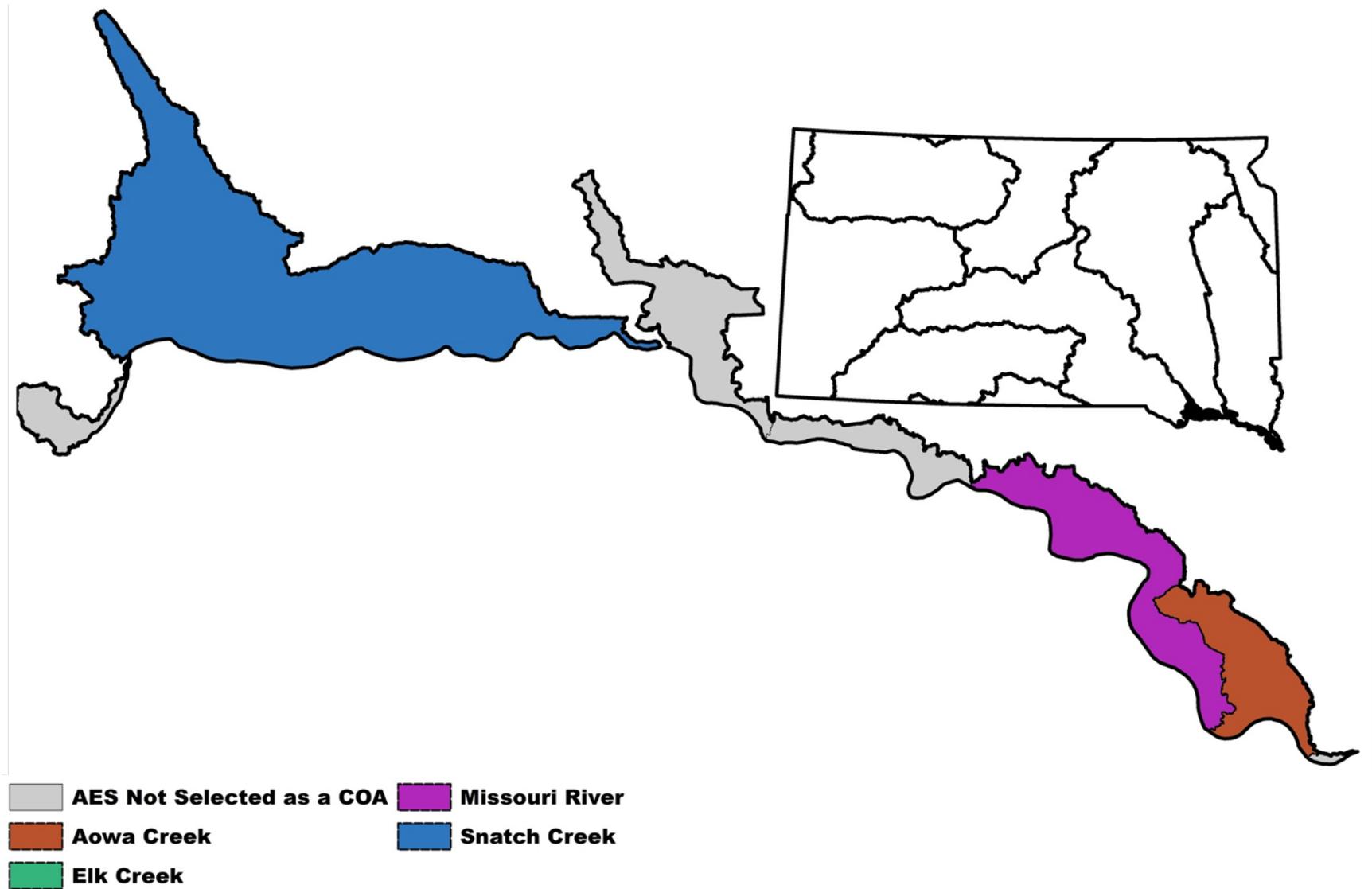


Figure T8. Little Sioux/Nemaha Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T9. Middle Missouri Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

MIDDLE MISSOURI						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Hermaphrodite Creek	74,835	Blue Sucker	Game Production Areas	0.1	213	Minor to Moderate Stressors Only
Hunkpapa Creek	62,263	False Map Turtle Shovelnose Sturgeon	Game Production Areas Corps of Engineers	5.3	415	Hydrologic Alterations
Moreau River	129,363	False Map Turtle Shovelnose Sturgeon	Corps of Engineers	0.0	415	Hydrologic Alterations
Oak Creek	198,948	False Map Turtle Shovelnose Sturgeon	School and Public Lands Corps of Engineers	1.4	316	Minor to Moderate Stressors Only
Spring Creek	969,015	False Map Turtle	Game Production Areas Parks and Recreation School and Public Lands Corps of Engineers Waterfowl Production Areas	4.0	418	Dams

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

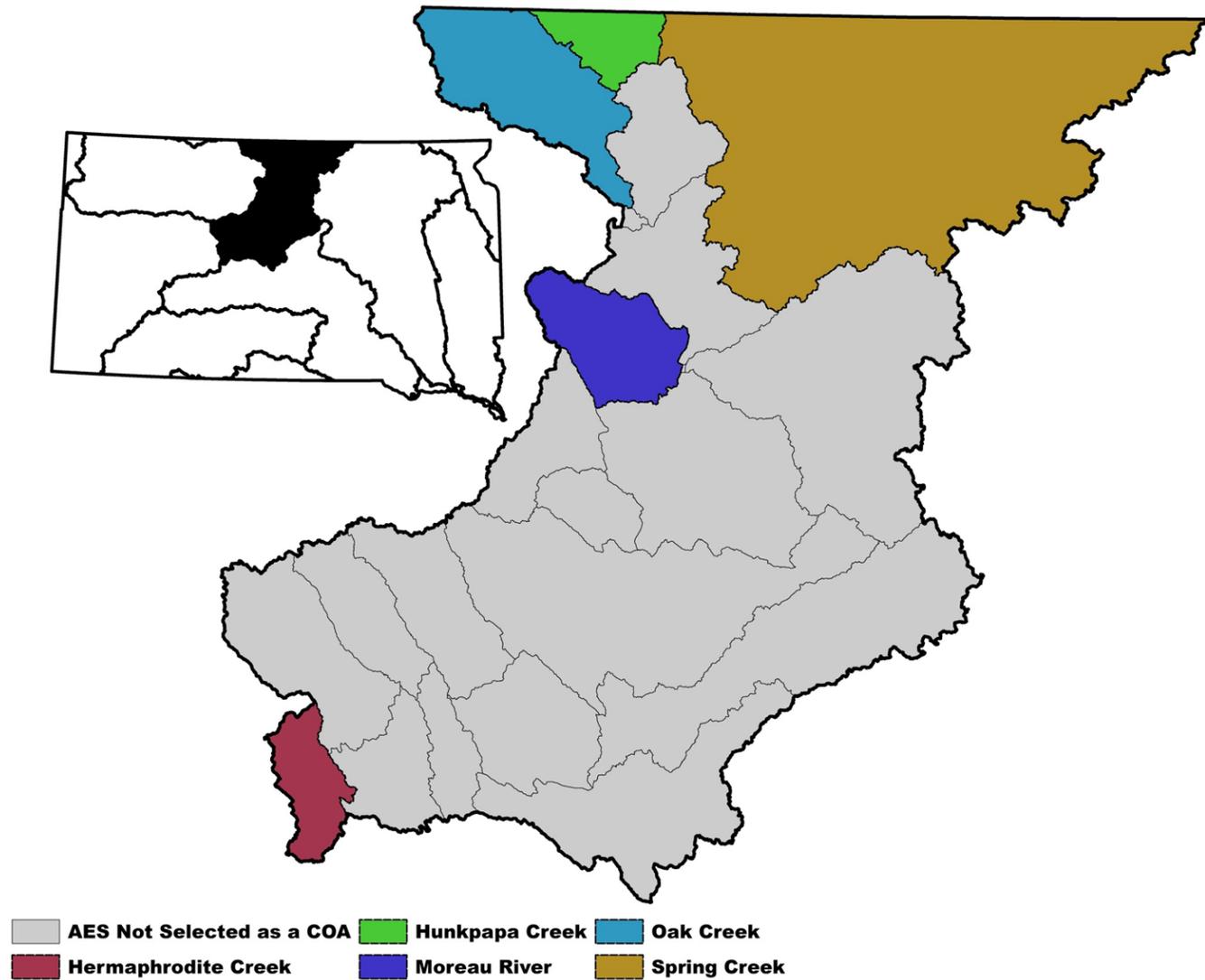


Figure T9. Middle Missouri Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T10. Niobrara Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

NIOBRARA						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Keya Paha River	673,513	Blacknose Shiner	Game Production Areas	0.3	415	Dams
		Northern Redbelly Dace	School and Public Lands			
		Northern Pearl Dace				
		Stonefly				
Niobrara River	102	Blue Sucker		0.0	212	Minor to Moderate Stressors Only
		False Map Turtle				
		Higgin's Eye				
		Mapleleaf				
		Pallid Sturgeon				
		Scaleshell				
		Shovelnose Sturgeon				
		Sicklefin Chub				
		Smooth Softshell				

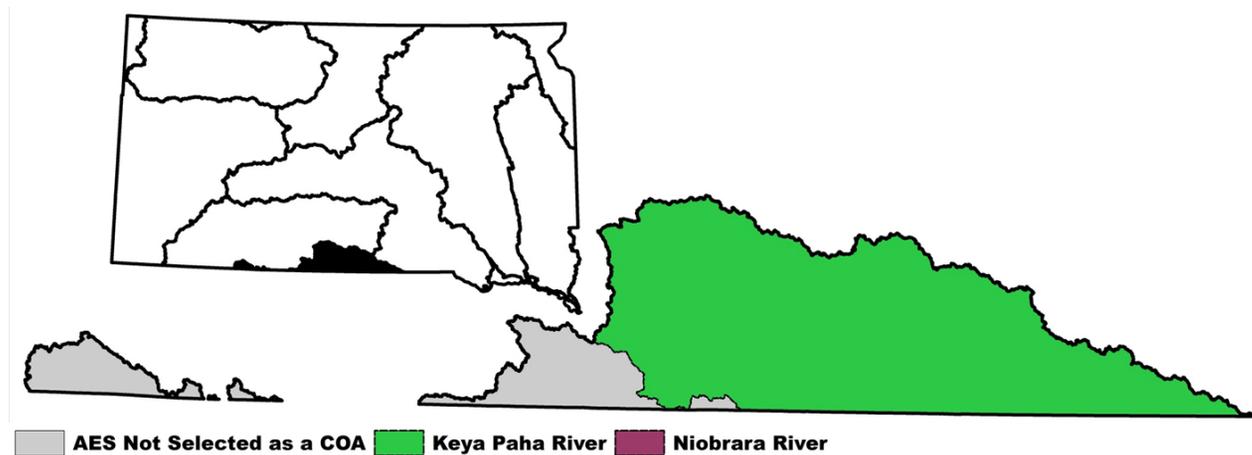


Figure T10. Niobrara Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T11. White Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

WHITE						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Cut Meat Creek	108,761	Finescale Dace Northern Redbelly Dace Northern Pearl Dace Sturgeon Chub		0.0	213	Minor to Moderate Stressors Only
Lake Creek	649,637	Finescale Dace Northern Redbelly Dace Northern Pearl Dace Sturgeon Chub	Game Production Areas School and Public Lands USFWS Refuge	4.1	313	Minor to Moderate Stressors Only
Little White River	52,323	Finescale Dace Northern Redbelly Dace Northern Pearl Dace Sturgeon Chub	School and Public Lands	0.8	414	Dams
Pine Creek	83,811	Finescale Dace Northern Redbelly Dace Northern Pearl Dace Sturgeon Chub	School and Public Lands	2.5	413	Dams
White Thunder Creek	107,156	Northern Pearl Dace Sturgeon Chub Stonefly	School and Public Lands	1.6	315	Minor to Moderate Stressors Only

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

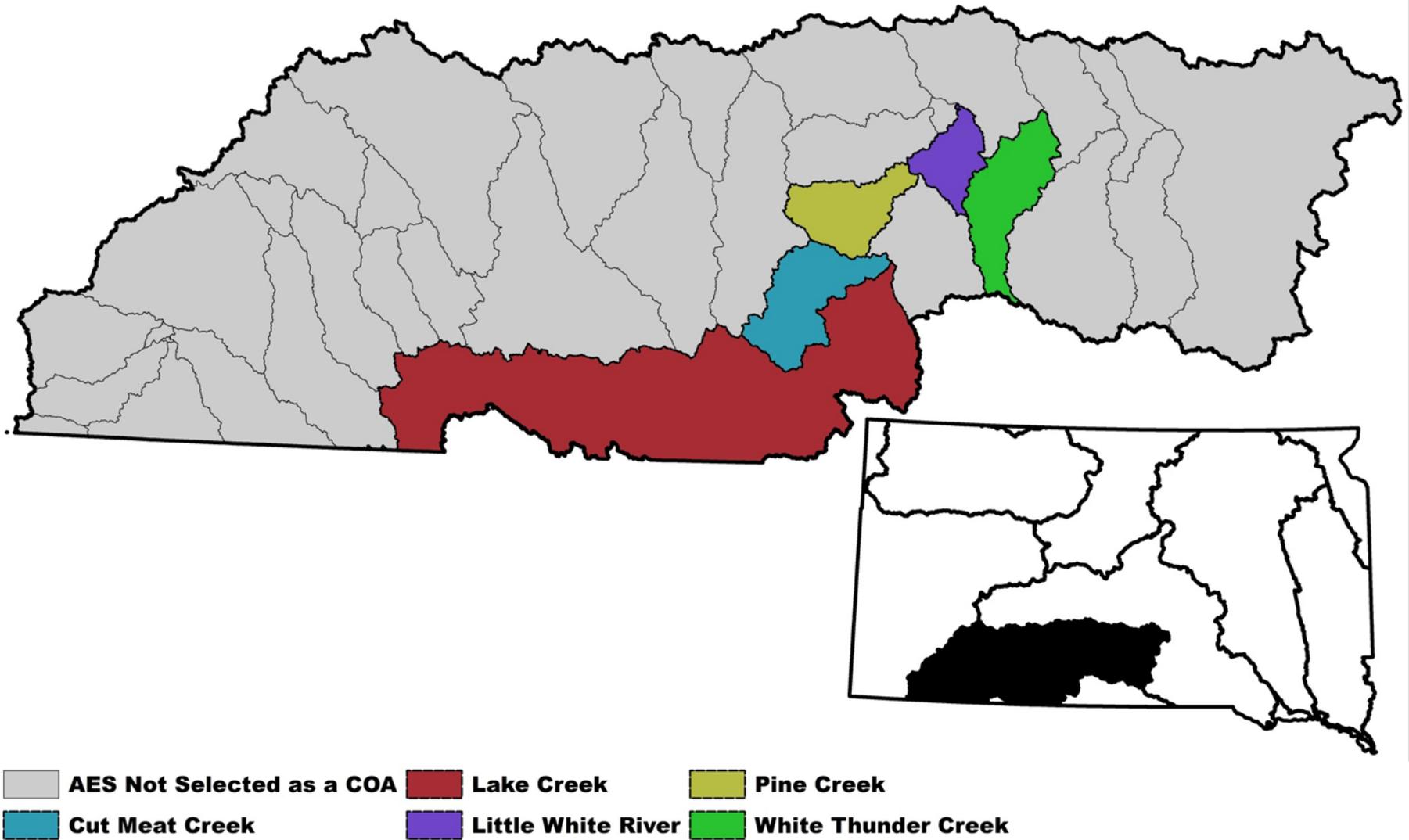


Figure T11. White Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

Table T12. Upper Minnesota River Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) descriptions.

UPPER MINNESOTA						
COA Name	Acres	Aquatic SGCN	Public Lands	% Public	HSI	Major Stressors
Cobb Creek	216,026	Banded Killifish Blackside Darter Creek Heelsplitter Hornyhead Chub Northern Redbelly Dace	Game Production Areas Parks and Recreation Waterfowl Production Areas	2.9	NA	NA
Little Minnesota River	858,501	Blackside Darter Carmine Shiner Central Mudminnow Creek Heelsplitter Hornyhead Chub	Game Production Areas Parks and Recreation Waterfowl Production Areas	1.9	NA	NA
Upper Yellow Medicine River	92	Stonefly		0.0	NA	NA
Wild Rice River	135,036		Game Production Areas School and Public Lands Waterfowl Production Areas	1.9	NA	NA

South Dakota Wildlife Action Plan

Appendix T (continued). Descriptions of aquatic Conservation Opportunity Areas (COAs) by Ecological Drainage Unit (EDU) and associated maps.

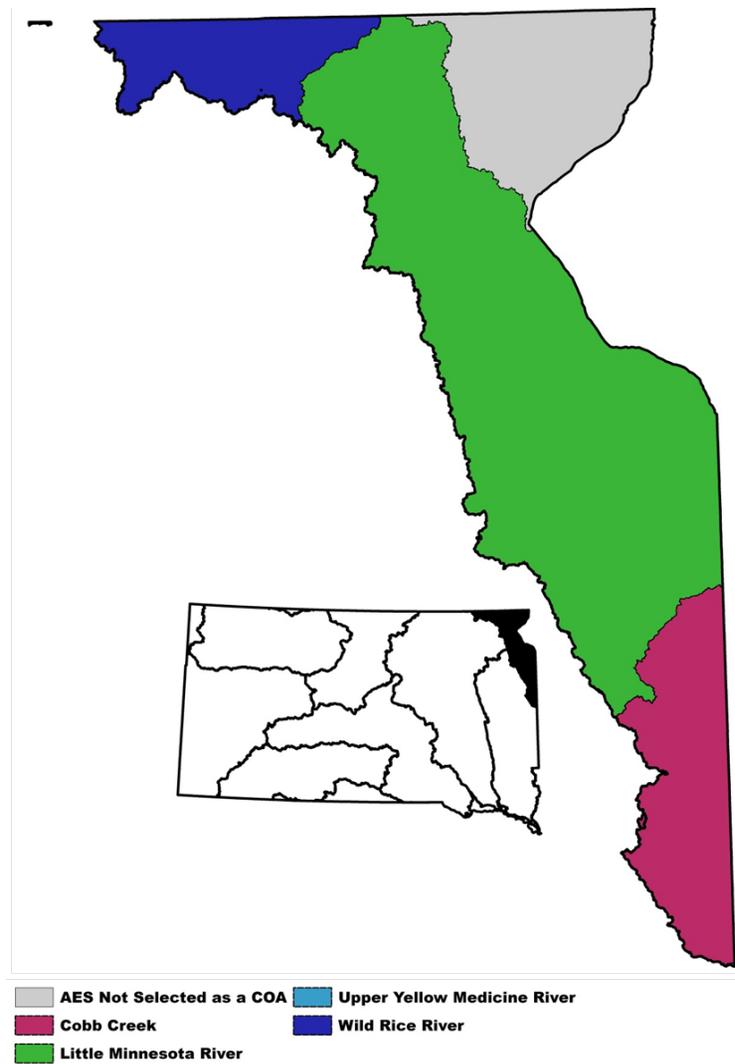


Figure T12. Upper Minnesota Ecological Drainage Unit (EDU) Conservation Opportunity Area (COA) map.

South Dakota Wildlife Action Plan

Appendix U. Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Banded Killifish	1	Cobb Creek	216,026
Blacknose Shiner	1	Keya Paha River	673,513
Blackside Darter	6	Brule Creek	1,581,667
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Cobb Creek	
		Little Minnesota River	
Blue Sucker	10	Beaver Creek	1,692,119
		Cedar Creek	
		East Brule Creek	
		Elk Creek	
		Emanuel Creek	
		Firesteel Creek	
		Hermaphrodite Creek	
		Niobrara River	
		Silver Creek	
		Wolf Creek	
Carmine Shiner	1	Little Minnesota River	858,501
Central Mudminnow	1	Little Minnesota River	858,501

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Finescale Dace	11	Cheyenne River	1,653,105
		Cottonwood Springs Creek	
		French Creek	
		Hay Creek	
		Indian Creek	
		Newton Fork	
		Redwater Creek	
		Cut Meat Creek	
		Lake Creek	
		Little White River	
		Pine Creek	
Hornyhead Chub	2	Cobb Creek	1,074,527
		Little Minnesota River	
Lake Chub	1	Rapid Creek	459,856
Logperch	5	Big Sioux River	708,073
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
Longnose Sucker	3	Hay Creek	561,407
		Rapid Creek	
		Redwater Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Mountain Sucker	8	Cheyenne River	1,218,429
		Cottonwood Springs Creek	
		French Creek	
		Hay Creek	
		Indian Creek	
		Newton Fork	
		Rapid Creek	
		Redwater Creek	
Northern Pearl Dace	7	Ponca Creek	1,961,242
		Keya Paha River	
		Cut Meat Creek	
		Lake Creek	
		Little White River	
		Pine Creek	
		White Thunder Creek	
Northern Redbelly Dace	7	Big Sioux River	1,985,004
		Keya Paha River	
		Cut Meat Creek	
		Lake Creek	
		Little White River	
		Pine Creek	
		Cobb Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Pallid Sturgeon	6	Bull Creek	2,378,088
		Choteau Creek	
		Emanuel Creek	
		Aowa Creek	
		Snatch Creek	
		Niobrara River	
Shovelnose Sturgeon	8	Bull Creek	2,348,630
		Emanuel Creek	
		Aowa Creek	
		Snatch Creek	
		Hunkpapa Creek	
		Moreau River	
		Oak Creek	
		Niobrara River	
Sicklefin Chub	7	Bull Creek	2,416,598
		Choteau Creek	
		Emanuel Creek	
		Aowa Creek	
		Missouri River	
		Snatch Creek	
		Niobrara River	
Southern Redbelly Dace	4	Brule Creek	507,140
		East Brule Creek	
		Pattee Creek	
		Silver Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Sturgeon Chub	10	Cheyenne River	1,658,710
		Cottonwood Springs Creek	
		French Creek	
		Indian Creek	
		Newton Fork	
		Cut Meat Creek	
		Lake Creek	
		Little White River	
		Pine Creek	
		White Thunder Creek	
Topeka Shiner	8	Big Sioux River	1,874,571
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Beaver Creek	
		Firesteel Creek	
		Wolf Creek	
Trout-perch	5	Big Sioux River	708,073
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Creek Heelsplitter	7	Big Sioux River	1,782,600
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Cobb Creek	
		Little Minnesota River	
Elktoe	5	Big Sioux River	708,073
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
Hickorynut	6	Brule Creek	1,589,929
		East Brule Creek	
		Pattee Creek	
		Beaver Creek	
		Firesteel Creek	
		Wolf Creek	
Higgin's Eye	7	Bull Creek	2,378,089
		Choteau Creek	
		Emanuel Creek	
		Aowa Creek	
		Elk Creek	
		Snatch Creek	
		Niobrara River	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Mapleleaf	14	Bull Creek	4,051,727
		Choteau Creek	
		Emanuel Creek	
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Beaver Creek	
		Firesteel Creek	
		Wolf Creek	
		Aowa Creek	
		Elk Creek	
		Snatch Creek	
		Niobrara River	
Pimpleback	7	Brule Creek	1,673,638
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Beaver Creek	
		Firesteel Creek	
		Wolf Creek	
Rock Pocketbook	3	Beaver Creek	1,166,498
		Firesteel Creek	
		Wolf Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Scaleshell	7	Bull Creek	2,378,089
		Choteau Creek	
		Emanuel Creek	
		Aowa Creek	
		Elk Creek	
		Snatch Creek	
		Niobrara River	
Yellow Sandshell	7	Brule Creek	1,673,638
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Beaver Creek	
		Firesteel Creek	
		Dot-winged Baskettail	
	Cottonwood Springs Creek		
	French Creek		
	Indian Creek		
	Newton Fork		
Stonefly	13	Big Sioux River	2,145,856
		Brule Creek	
		East Brule Creek	
		Pattee Creek	
		Silver Creek	
		Cheyenne River	
		Cottonwood Springs Creek	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Stonefly (continued)		French Creek	
		Indian Creek	
		Newton Fork	
		Keya Paha River	
		White Thunder Creek	
		Upper Yellow Medicine River	
False Map Turtle	14	Bull Creek	4,416,639
		Cedar Creek	
		Choteau Creek	
		Emanuel Creek	
		Brule Creek	
		Grand River	
		Aowa Creek	
		Missouri River	
		Snatch Creek	
		Hunkpapa Creek	
		Moreau River	
		Oak Creek	
		Spring Creek	
		Niobrara River	

South Dakota Wildlife Action Plan

Appendix U (continued). Aquatic species of greatest conservation need with associated Conservation Opportunity Areas (COA) and total number of acres contained within a COA.

Aquatic SGCN	# of COAs	COA Name	Total Acres
Smooth Softshell	9	Choteau Creek	1,959,095
		Emanuel Creek	
		Brule Creek	
		Beaver Creek	
		Firesteel Creek	
		Wolf Creek	
		Aowa Creek	
		Snatch Creek	
		Niobrara River	

South Dakota Wildlife Action Plan

Appendix V. Land and resource agencies, universities, and tribes contacted during Wildlife Action Plan Revision

Name	Location
U.S. Fish and Wildlife Service, Ecological Services	Pierre, SD
U.S. Fish and Wildlife, Partners for Wildlife Program	Brookings, SD
U.S. Fish and Wildlife Service, Sand Lake National Wildlife Refuge	Columbia, SD
U.S. Fish and Wildlife Service, Waubay National Wildlife Refuge	Waubay, SD
U.S. Fish and Wildlife Service, LaCreek National Wildlife Refuge	Martin, SD
U.S. Fish and Wildlife Service, Lake Andes National Wildlife Refuge	Lake Andes, SD
Bureau of Land Management	Belle Fourche, SD
Bureau of Reclamation	Bismarck, ND
Bureau of Indian Affairs	Aberdeen, SD
U.S. Forest Service, Nebraska National Forest	Chadron, NE
U.S. Forest Service, Fort Pierre Ranger District	Fort Pierre, SD
U.S. Forest Service, Fall River Ranger District	Hot Springs, SD
U.S. Forest Service, Wall Ranger District	Wall, SD
Badlands National Park	Interior, SD
Wind Cave National Park	Hot Springs, SD
Jewel Cave National Park	Custer, SD
U.S. Forest Service, Dakota Prairie Grassland	Bismarck, ND
U.S. Forest Service, Black Hills National Forest	Custer, SD
U.S. Forest Service, Rocky Mountain Research Station	Rapid City, SD
Cheyenne River Sioux Tribe	Eagle Butte, SD
Oglala Sioux Tribe	Pine Ridge, SD
Oglala Sioux Parks and Recreation Authority	Kyle, SD

South Dakota Wildlife Action Plan

Appendix V (continued). Land and resource agencies, universities, and tribes contacted during Wildlife Action Plan Revision.

Standing Rock Sioux Tribe	Fort Yates, ND
Crow Creek Sioux Tribe	Fort Thompson, SD
Lower Brule Sioux Tribe	Lower Brule, SD
Sisseton-Wahpeton Oyate	Agency Village, SD
Flandreau Santee Sioux Tribe	Flandreau, SD
Rosebud Sioux Tribe	Rosebud, SD
U.S. Department of Agriculture, Natural Resources Conservation Service	Huron, SD
U.S. Park Service, Missouri National Recreational River	Yankton, SD
U.S. Geological Survey, Missouri River Coordinator	Yankton, SD
U.S. Geological Survey, Plains and Prairie Potholes Landscape Conservation Cooperative	Bismarck, ND
Prairie Pothole Joint Venture	Bismarck, ND
Northern Great Plains Joint Venture	Bismarck, ND
U.S. Fish and Wildlife Service, Huron Wetland Management District	Huron, SD
U.S. Fish and Wildlife Service, Madison Wetland Management District	Madison, SD
South Dakota Department of Environment and Natural Resources	Pierre, SD
South Dakota Department of Agriculture	Pierre, SD
South Dakota Department of Transportation	Pierre, SD
South Dakota Department of Tribal Relations	Pierre, SD
South Dakota State University, Department of Natural Resources	Brookings, SD
University of South Dakota, Department of Biology	Vermillion, SD
Black Hills State University, School of Natural Sciences	Spearfish, SD
Northern State University, Department of Biology	Aberdeen, SD

South Dakota Wildlife Action Plan

Appendix V (continued). Land and resource agencies, universities, and tribes contacted during Wildlife Action Plan Revision.

South Dakota Office of School and Public Lands	Pierre, SD
U.S. Army Corps of Engineers, Gavins Point Project	Yankton, SD
U.S. Army Corps of Engineers, Fort Randall Project	Pickstown, SD
U.S. Army Corps of Engineers, Oahe Project	Pierre, SD
U.S. Army Corps of Engineers, Big Bend Project	Chamberlain, SD
U.S. Army Corps of Engineers, Threatened and Endangered Species Program	Yankton, SD
South Dakota Governor's Office	Pierre, SD
Northern Prairies Land Trust	Sioux Falls, SD

South Dakota Wildlife Action Plan

Appendix W. Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.

From: Larry E. Lewis [<mailto:lew@nrctv.com>]
Sent: Sunday, May 11, 2014 4:14 AM
To: GFP Wild Info
Cc: info@iwla.org
Subject: The South Dakota Wildlife Action Plan

Recently I have been watching with dismay as old tree groves, former building sites and wetlands are drained/destroyed.....most if it on private land where GFP and other public rights authorities have minimal authority to act on behalf of the public's interest. However, when the activity reaches the nearest public right-of-way (ROW) typically no one is there to represent the public interest and regulate activities.

South Dakota is laced with public road systems and ROW's that are impacted by and often facilitate such destruction by virtue of the authorities involved not exercising their authority and responsibility to regulate activities like wetland drainage, and farming encroachment occurring within our public road ROW's.

As a Wildlife Agency SDGFP shares this oversight responsibility with many other agencies, particularly township, county, state and federal highway authorities. Please commit staff and dollars to this very important need. High ag prices have caused habitat losses and aggressive behaviors in farming public ROW's that I witnessed in Minnesota. By the default practice of claiming you have no authority to regulate such activities you as an agency can destroy more habitat in the next few years that you will ever be able to purchase and protect via other means in an equal amount of time.

What needs to happen:

- Rally support from others with an interest such as the Izaak Walton League, Pheasants Forever, Ducks Unlimited, US Fish & Wildlife, etc.
- Rally support from township, county, state and federal highway authorities charged with enforcing existing policy protecting public ROW's
- Support and, when necessary, force those responsible for public ROW protection to defend, maintain and protect the public's interest in this existing, yet diminishing public recourse.

Your inclusion of this in your long term action plan would be appreciated, but more importantly, it deserves immediate attention and an organized effort to immediately curtail and control ROW habitat destruction. Greed rarely comes with a conscience, so when trees are removed, fencelines are removed, ditches are dug.....some authority needs to be there to properly mark and defend ROW boundaries. South Dakota citizens deserve that much from the organization charged with wildlife management within its boundaries!

Your consideration of my comments are appreciated;

South Dakota Wildlife Action Plan

Sincerely,

Larry Lewis
40751 102nd St.
Hecla, SD 57446
Ph - 605-994-7446 (cel)
lew@nrctv.com

SDGFP response: SDGFP regularly reminds the public and other agencies of mowing date restrictions on rights-of-ways covered by such restrictions. SDGFP has also encouraged the South Dakota Department of Transportation to use seed mixes that are more favorable to wildlife use than smooth brome. An additional bullet point was added to Conservation Actions Summary to represent this concern.

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.



SOUTH DAKOTA DEPARTMENT OF AGRICULTURE

DIVISION OF RESOURCE CONSERVATION & FORESTRY

523 East Capitol Avenue, Pierre, SD 57501-3182

Phone: 605.773.3623 / FAX: 605.773.4003

Web: sdda.sd.gov/conservation-forestry/

June 2, 2014

Tom Kirschenmann
Chief, Terrestrial Resources
SD GFP, Wildlife Division
523 E Capitol Ave
Pierre, SD 57501

RE: South Dakota Wildlife Action Plan

Dear Mr. Kirschenmann:

The South Dakota Department of Agriculture, Division of Resource Conservation and Forestry has reviewed the South Dakota Wildlife action Plan.

We have no comments at this time. We appreciate the opportunity to comment.

Sincerely,

Ann M. Juetter
Natural Resource Planner

XC: Bill Smith, Acting Division Director
Greg Josten, Acting State Forester

SDGFP response: None necessary

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.



Rockies and Plains Office

535 16th Street, Suite 310 | Denver, Colorado 80202

www.defenders.org

Date: June 6, 2014

To: Eileen Dowd Stukel, South Dakota Game Fish and Parks (SDGFP)

RE: Comments to 2014 South Dakota State Wildlife Action Plan

Submitted electronically at: wildinfo@state.sd.us.

Dear Eileen and the SDWAP Planning Team:

On behalf of its 800 supporters in South Dakota, Defenders of Wildlife submits the following comments on the 2014 South Dakota State Wildlife Action Plan (SDWAP). Founded in 1947 as Defenders of Furbearers, Defenders of Wildlife is a nonprofit organization dedicated to the protection and restoration of wildlife and plants in their natural communities. Defenders' distinguished record of leadership on America's conservation efforts includes supporting policies and practices that help maintain populations of all of North America's wildlife species. Defenders' 10-year organizational conservation benchmarks include: 1) Ensuring that more than half of the species currently listed under the Endangered Species Act are stable or improving; 2) Ensuring that 25 of Defenders-identified vulnerable species are secure in important ecosystems and focal landscapes; and 3) doubling the acreage of high-priority wildlife habitat that is managed for ecological integrity. We are pleased to see a commonality in goals in the South Dakota SWAP and Defenders' conservation goals. We've reviewed the SWAP primarily from this perspective, and offer some general comments before more detailed comments that follow below.

Overall Comments

Defenders commends the SDWAP team for assembling a well-organized and well-articulated document overall. The ability to "jump to" relevant sections and appendices is very useful.

Defenders also appreciates the significant discussion regarding potential future impacts of climate change, which the organizational approach SDFWP has chosen for this SWAP (landscape/community) is particularly well-suited to analyze.

The range maps for aquatic species are more informational overall than those presented for terrestrial species. Distribution for terrestrial species would be far more compelling if: 1) they were presented similarly (e.g., some distributions are by county, some are circumscribed perimeters); 2) if some point locations were provided (as for some aquatic species); 3) if some sort of indicia of probability of likelihood of occurrence were presented (as for aquatic species); 4) if they were presented in some other format (e.g. suitable habitat, nesting habitat, etc). This may be a case where

South Dakota Wildlife Action Plan

obtaining the level of detail of information needed to develop a map could drive more efficient monitoring.

Defenders is pleased to see the SDWAP include S-Ranked S3 Species in its Species of Greatest Conservation Need (SGCN) list. What would be useful, either in a table or in the individual species profiles, would be some indication of the severity/trend of the conservation challenges indicated for each species. For example, take the threat given in the example for the American Burying Beetle (p. 53), loss of carcasses: is this accelerating, incremental, or easily mitigated in some way? Are some forms of habitat loss occurring faster than others?

Defenders also concurs with the SDWAP's characterization of major historical ecological drivers over much of the South Dakota grasslands, particularly bison, black-tailed prairie dogs, beaver, fire, and floods. However, having identified the important role that these drivers play in maintaining ecosystem and wildlife health, there is virtually no further mention in the SDWAP of how these drivers might be restored over some area of the state. With the SDWAP goal of maintaining a minimum of 10% (by area) representation of historical ecosystems (SDWAP p. 148), a significant effort needs to be undertaken to revitalize these drivers, three of which also happen to be wildlife species.

Defenders notes that current South Dakota law severely restricts the ability to restore or maintain prairie dogs, for example, over even a fraction of the landscape that would be meaningful in terms of meeting the goals of maintaining 10% representation under historical conditions. Understanding that the political climate has hamstrung this plan from integrating this important driver as part of the SDWAP (SDWAP p.174), it almost goes without saying that the plan is limited in addressing conservation goals for a host of other of its target species. Others (see e.g. US Fish and Wildlife Service 2013) are asking even far less...the state's share of prairie dog occupancy to meet black-footed ferret recovery goals, according to the black-footed ferret Recovery Plan, is around 30,000 ac, or about .001% of the state's land base. At present, the state is far short of ensuring that acreage for black-footed ferret recovery. As a reality check, it seems unlikely the SDWAPs 10% representational goals can be achieved if the state can't deliver on 1/1000th of that amount for one of its most important drivers and ecological communities. Moreover, how it will address conservation threats for several of its SGCN species, such as burrowing owls, ferruginous hawks, and swift fox, without inclusion of a conservation strategy for prairie dogs is somewhat mystifying.

In this same light, bison and beaver targets should be made a part of this plan in order to ensure that some level of representation of those drivers are also maintained. Bison occur in several federal and state parks (as well as some private ownership) in the state, but additional effort should be made to expand conservation herds of bison on public lands or combinations of lands involving private/public partnerships.

Similarly, beaver likely occur on some federal lands, but some effort needs to be made to assess the amount of beaver-occupied stream miles and distribution across the state to determine whether this driver is meeting a significant part of its targets. The SDWAP will guide the state's conservation

South Dakota Wildlife Action Plan

efforts for the next decade, and it is important that these species receive some additional mention in terms of SDWAP goals.

Conservation Actions and Opportunities

Defenders appreciates the Conservation Opportunities Analysis. However, again, the SDWAP falls short in tying an implementation strategy to this analysis. There are numerous actions that could be undertaken or suggested as an outcome of this analysis: the state could work with NRCS to target programs to private landowners specifically within the COA-identified areas, protected areas could be proposed, conservation easements purchased, regulatory limitations enacted, and so forth. None of these strategies seems to be suggested, let alone prioritized. As with many very good insights developed in the SDWAP, the “action” part of the plan is lacking here. The purpose of this document as a genuine blueprint for moving forward based on the information needs to be made explicit somewhere in the SDWAP.

Moreover, the conservation actions summary are simply too general. Taken together, the suggested summary is a list of bullets and not a comprehensive plan. This also makes it difficult to prioritize conservation actions, and no guidance for prioritizing conservation actions for SGCN appears to be provided in this document. Some level of guidance for how the SDWAP might prioritize its efforts given conservation actions would be useful, and this would likely involve measuring the extent of threats for each SGCN in a more systematic way, as some threats are much more dire depending on the species and/or habitat, yet those differences in magnitude are in no way offered in the SDWAP. This is especially important as the ultimate measure of the SDWAP is if the status of the SGCN species is stabilized or improves.

SGCN Species

The SDWAP lacks a discussion of goals for most of the SGCN. Some of these species have separate conservation plans which (presumably) set out goals, but these are not carried forward into the SDWAP. Goal setting is non-trivial, should be done with public and private partners, and at any rate is an important part of conservation planning that both AFWA (2011, 2012) recommendations and the Open Standards for the Practice of Conservation (CMP 2013) recommend. We recommend that goals should focus on restoration rather than numerical targets, which are notoriously difficult to determine and monitor. It would be useful if these were stated conspicuously in relation to the action items and if there were similar objective goal statements for each of the SGCN species so that the public is aware of where the SDWAP is headed.

It is also impossible to determine if the “results chain” (AFWA 2011) that is described under the action items have any meaningful relation to achieving some goal. Tracking progress toward the goals is as important a part of implementation as describing activities that may have positive outcomes for the species but are not directed at some measurable outcome. There should be a stated goal in the action matrix so it can be readily seen how the actions intend to meet the goal.

South Dakota Wildlife Action Plan

There is also very little discussion of relevant current conservation initiatives related to SGCN, as there are listed for monitoring initiatives. It would be valuable to include this information (if any), in the matrix, or at least reference Appendix P in the species descriptions for each species, as the SDWAP needs to integrate with existing plans and initiatives. Other suggestions include discussion of 'additional resources' under each issue and SCGN, which would help the public find additional information.

Funding

The plan (and narrative overview) only briefly discusses funding issues. If congressional funding is uncertain, where will the dollars come from to implement the plan? Is there some way to at least briefly outline the funding shortfalls/needs? Again, it would be useful if there were some type of prioritization for the 10-year life of the Plan to tie to funding priorities. The SDWAP should also include a section on policy options.

Additional comments

Appendix P. An additional initiative, and possible cross-reference with your Conservation Opportunities Analysis is the Northern Plains Conservation Network (NPCN), <http://www.npcn.net/>, and the Ocean of Grass Assessment: <http://www.protectedareas.info/upload/document/ecoregionplan-northerngreatplainconservationassessmentsummary.pdf>, (Forrest et al 2004).

Summary and Conclusion

Defenders appreciates the opportunity to comment on the SDWAP and further wishes to commend the SDWAP team for pulling together a tremendous amount of information in a highly accessible document. Our primary concern is that the plan, as such, has some additional work to make it useful for planning purposes. If the public is to use this document to get behind or contribute to conservation efforts, then a clearer set of goals and actions need to be articulated so that we are all pulling in the same direction. To the extent that this can be better defined in this or future revisions the more useful this plan will be. Thanks and Defenders looks forward to continuing to work with SDGFP on future wildlife planning and conservation in South Dakota.

Sincerely,



Steve Forrest
Senior Representative Rockies and Plains Program

South Dakota Wildlife Action Plan

References Cited:

Association of Fish and Wildlife Agencies. 2012. Best Practices for State Wildlife Action Plans. 66 pp. <http://www.fishwildlife.org/files/SWAPBestPractices.pdf>.

Association of Fish and Wildlife Agencies. 2011. Measuring the effectiveness of State Wildlife Grants. http://www.fishwildlife.org/files/Effectiveness-Measures-Report_2011.pdf.

Conservation Measures Partnership. 2013. Open Standards for the Practice of Conservation, Version 3.0. <http://www.conservationmeasures.org/wp-content/uploads/2013/05/CMP-OS-V3-0-Final.pdf>.

Forrest, S.C., H. Strand, W.H. Haskins, C. Freese, J. Proctor and E. Dinerstein. 2004. Ocean of Grass: A Conservation Assessment for the Northern Great Plains. Northern Plains Conservation Network and Northern Great Plains Ecoregion, WWF-US, Bozeman, MT.

U.S. Fish and Wildlife Service. 2013. Recovery plan for the black-footed ferret (*Mustela nigripes*). U.S. Fish and Wildlife Service, Denver, Colorado. 157 pp. <http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/2013NovRevisedRecoveryPlan.pdf>

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.

SDGFP response to Defenders of Wildlife letter, listed by subject areas:

Range maps: An attempt was made to use a similar approach to represent species ranges for both terrestrial and aquatic species. However, the lack of a similar type of base map for terrestrial species did not allow us to map terrestrial species occurrences in the same way that aquatic species distributions were mapped. Species distribution maps will continue to be improved with additional data sources, and such updates will be included on the SDGFP website.

Conservation challenges severity/trends: To the extent that information exists, threat severity and trends are incorporated into the state and global heritage ranks. Particularly for rare species that are not state or federal listed, limited information exists for threat severity and trends. We will continue to identify and monitor threat severity and trends as information becomes available.

Ecological drivers:

Bison/cattle: Bison is not simply a wildlife species, but also a grazer owned by private individuals and a grazer managed by tribes and other government entities. The ecological driver is grazing by a multitude of herbivores, of which bison was the main historical ungulate. Managed grazing by livestock can simulate some of bison herds' grazing effects.

Prairie dogs: The background information presented in this comment letter implies that South Dakota is not meeting its prairie dog acreage goals related to multistate prairie dog planning and black-footed ferret recovery. Based on the most recent estimates in 2012, 526,641 acres were mapped in South Dakota, categorized by landownership as tribal (222,173 acres) or nontribal (304,468 acres). South Dakota has met its statewide and nontribal acreage goal as outlined in the state prairie dog management plan. As stated in the draft Wildlife Action Plan, existing approved management plans, whether state, tribal or federal, are not superseded by the Plan, which is a voluntary strategic framework to encourage partners to manage for native ecosystems.

We do not believe we possess the necessary background data to set beaver goals, but we support additional investigation into the historical amount of beaver-occupied habitat to help establish a historical frame of reference. In addition, we have worked with and encouraged Black Hills National Forest to allow beaver expansion in the Black Hills of South Dakota.

Conservation actions and opportunities: The suggested action that we work with NRCS to target funds or new or existing programs to correspond with conservation opportunity areas is an example we have used extensively in public open houses on this topic, and we will add that example to the text. The additional suggestions that are voluntary practices, such as conservation easements and land acquisition from willing sellers, are consistent with the Plan's voluntary approach. The COA maps can easily serve this function. The other suggestions that are regulatory are inconsistent with our preferred approach to encourage voluntary partnerships among individuals, tribes, organizations, and agencies to fulfill the goals of the Wildlife Action Plan.

South Dakota Wildlife Action Plan

Conservation actions summary, regarding suggested prioritization by SGCN: We have addressed the lack of information necessary to adequately prioritize threats by SGCN earlier in this response. In addition, the emphasis on habitat restoration to provide for the needs of many species will help address the needs of individual SGCNs. To address the point that the summary bullets are too general, we have added several points to this section.

SGCN species, regarding lack of identified goals: This comment appears to place greater emphasis on single species monitoring than is intended within the content of Wildlife Action Plans. The purpose of the coarse filter approach is to promote the importance of providing a diversity of habitats under appropriate disturbance regimes as contrasted with the traditional single-species approach. The single-species management approach is not feasible when trying to plan for the full array of fish, wildlife, and associated habitats, as is the directive for Wildlife Action Plans.

Reference to AFWA 2011 results chain: We agree that this system promotes better accountability and expect that future State Wildlife Grant projects will more fully incorporate these planning elements.

Current conservation initiatives as related to SGCN: We will follow this suggestion to better link these elements by adding existing management and recovery plans to Appendix P. We have not identified additional resources for each issue and each SGCN. We intend to use the SDGFP website as an information tool for potentially sharing such information in the future.

Funding issues: We chose not to describe the history of funding related to wildlife diversity or the current efforts to secure stable, long-term funding. We also chose not to include policy options because such information quickly becomes dated, and we believe it is more appropriate for interested members of the public to join the South Dakota Teaming with Wildlife Coalition (<http://gfp.sd.gov/wildlife/funding/teaming.aspx>) and to monitor this situation by that means or by monitoring AFWA's Teaming With Wildlife website (<http://teaming.com/>). We added a reference to the importance of securing funding to help meet representation goals to the Conservation Actions Summary. We remind the commenter that the Plan is a strategic framework for South Dakota, rather than an operational plan for SDGFP. For that reason, we chose not to include specific budgets or to estimate the amount of funding needed to fully implement the Plan.

Additional comments: We have added the recommended conservation initiative to our list.

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.



426 Saint Joseph Street
Rapid City, SD 57701

605-342-0429 (a)
605-342-0463 (f)

June 6, 2014

SD Dept of Game Fish and Parks
523 E. Capitol – Foss Building
Pierre, SD 57501

To whom it may concern,

The South Dakota Stockgrowers Association Wildlife committee submits the following comments to the South Dakota Wildlife Action Draft Plan Revision (2014).

A.

1. Action plan was written to meet standards and needs of Fed. agencies. to receive future funding. We believe the focus should be on the state's needs and the best interest of our state wildlife. We're concerned that this plan cedes control of management to the federal agencies by catering to their needs.
2. SD has a very short historical record compared to other parts of the nation and the world. While there may be climate trends, it is impossible to determine climate changes that are long term trends due to lack of historical data available for our state.
3. Using pre-European baselines is not realistic due to lack of documentation. Lewis and Clark traveled along waterways which were the source of water for animal life before man made impoundments and improvements were made. Wildlife was concentrated to several miles either side of these waterways. We should not be surprised they encountered wildlife in large numbers, however, the assumption that what they saw along the Missouri River is indicative of what all South Dakota looked like at that time may be flawed.

B.

1. Species "dependent" on BTPD for survival (burrowing owl, swift fox, ferrets) are now under more stress due to lack of BTPD management and control by govt. agencies with BTPD colonies on lands they control. Many of the colonies have encountered plague because of overpopulation.
2. SD GF&P should work to hold other government agencies and NGO's accountable for the wildlife management on properties under their management so that adjacent landowners are not negatively affected.

C.

1. How does GF&P intend to work with private landowners where the majority of wildlife occurs? The goal is admirable and appreciated but not defined.
2. While opinions of non-landowners should be considered, there is a significant element missing from this plan. There is no chapter describing the interface between GF&P and private landowners. Much of the habitat described occurs on private property. Emphasis

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■ www.southdakotastockgrowers.org

South Dakota Wildlife Action Plan

should be placed on collecting first hand observation from private landowners about species, habitat, short and long term trends those who are on the land are observing. We have been very frustrated about SD GFP's actions to write management plans that use survey data and input from non-landowners and individuals who do not have first-hand experience or consequences of decisions made. We strongly urge SD GFP to prioritize private landowners interests as this plan moves forward. The success of private landowners in managing wildlife is imperative for strong landowner relations to the agency and for the success of the wildlife populations being managed.

3. Managing for one particular "keystone" species does not magically create a healthy ecosystem. Example: BTPD. Overpopulation of BTPD has resulted in plague and sedimentation of watersheds. A more holistic approach should be taken to managing these populations.
4. SD GF&P should continue its work of monitoring and managing wildlife for South Dakotans, however, it is imperative to achieving a positive outcome in this endeavor that South Dakotans owning the land, managing the land, and caring for the land be consulted with at the beginning and throughout any management process by our state agencies.
5. SD GF&P should not enter into any cooperative agreements with any other governmental agency or non-governmental organization for the purpose of wildlife management if the interests of the private landowners, on whose land the majority of South Dakota's wildlife and fish species exist, are not solicited and protected. These cooperative agreements have provided little benefit to the populations and have worked to undermine private property rights and the ability of the state to defend private property against federally administered wildlife management plans.

Thank you for your consideration.

Respectfully submitted,

msf

Mark DeVries
Wildlife Committee Chairman
South Dakota Stockgrowers Association


Silvia Christen
Executive Director
South Dakota Stockgrowers Association

SDGFP response: Our agency fully appreciates the critical importance of private landowners to the success of any effort to work cooperatively on wildlife and habitat management and restoration. This concept is communicated in many parts of the Wildlife Action Plan. Our agency partners with landowners in many programs and assists landowners in resolving issues dealing with wildlife. We will continue our best efforts to nurture and improve these relationships.

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.

From: Cliff Wallis [<mailto:deercroft@shaw.ca>]

Sent: June-06-14 4:11 PM

To: 'wildinfo@state.sd.us'

Subject: South Dakota Wildlife Action Plan

The Alberta Wilderness Association supports the recommendations made today in a letter to you regarding the South Dakota Wildlife Action Plan.

We look forward to some integration of these recommendations into wildlife management in South Dakota. The Alberta Wilderness Association supports maintenance and restoration of grasslands and grassland species throughout the Northern Great Plains and appreciates the important role South Dakota could play in this regard.

Cliff Wallis P.Biol.

Vice-President, Alberta Wilderness Association

Box 6398, Station D

Calgary, AB T2P 2E1 CANADA

deercroft@shaw.ca

phone (403) 2711408 (direct); (403) 6071970 (cell); (403) 2832025 (office)

Sorry, the first line in the email below should have read:

“The Alberta Wilderness Association supports the recommendations made today in a letter to you by Defenders of Wildlife regarding the South Dakota Wildlife Action Plan.”

Good luck with your efforts.

Cliff Wallis P.Biol.

Vice-President, Alberta Wilderness Association

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SDGFP response: See response to Defenders of Wildlife comment letter earlier in this appendix.

South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718

Nancy Hilding
6300 West Elm
Black Hawk, SD 57718
June 6th, 2014

Dear Game Fish and Parks Staff,

I attach 2 maps in a set that came from the BLM. Please scroll down to the second map in the set (Vegetation-Landfire 2010). It shows vegetation in SD. The legend includes "tree-dominated" color, which shows tree-dominated areas on the map.

Your map (Figure 3-2) shows similar values (forested ecosystems) but does not acknowledge areas of SD that contribute to the Pine Ridge Ecosystem of South Dakota, Nebraska and Wyoming. It does not acknowledge tree covered area on the Rosebud Reservation or a tree covered area along the sides of the Missouri in Gregory, Charles Mix and Tripp Counties.

We suggest you review this BLM data on trees and we suggest adding this BLM data on vegetation cover to your map on Figure 3-2 for forested ecosystems.

Why do the forests of Custer National Forest rate such designation, but not these areas I mention? We have special concern for the Pine Ridge Ecosystem, which exists in three states, but in SD mostly on a Reservation. How much have you networked with Reservations about their ecosystems?

Species with short or no review

We are concerned that there is no mention of the grey wolf in this document. We did search for wolf and wolves and found nothing. The USFWS has yet to delist the wolf in SD. The delisting is stalled, because wolf experts don't agree on science issues, thus best science has not been used in the delisting effort. People occasionally report wolf sightings in the Black Hills - rumors of wolves.

We are also concerned for the Canadian Lynx, which is only mentioned in a chart on page 494.

We are concerned for the viability of the mountain lion given the aggressive hunting in Wyoming Black Hills and South Dakota. The lions have no idea where the boundaries are and the Wyoming seasons are fixed for 3 years. SD can't control what Wyoming does. We hope you have a larger section on mountain lions.

South Dakota Wildlife Action Plan

We did find change for "bear" and found no reference. I bear was found in Bearlodge Mtns by Wyoming and removed relocated.

Thanks,

Nancy Hilding
President
Prairie Hills Audubon Society,

For self and Society

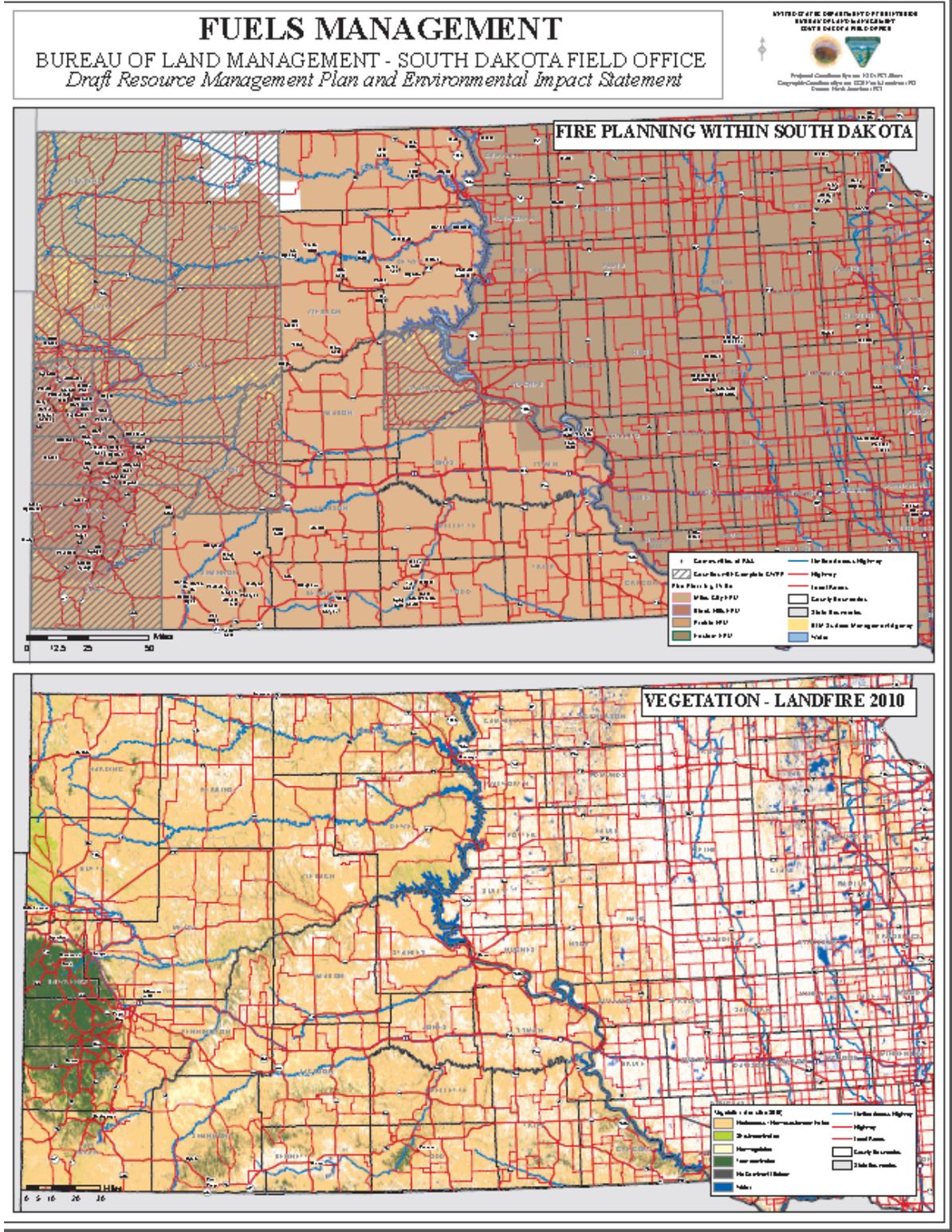
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SDGFP response: Regarding Figure 3-2 and reference to Pine Ridge Woodlands: Thank you for pointing out this area of confusion. This figure does not show the pine savanna vegetation on the Pine Ridge or many other small woodlands in South Dakota, partly because some of them are included in the riparian coverage, but also because this particular figure uses a base map of soils/ecological sites and not of existing vegetation. We have added a vegetation map ([Figure 6-4](#)) derived from the National Land Cover Dataset to show the location of some of the larger of these Ponderosa pine savannas and other wooded uplands and to show the current extent and distribution of other land cover types in South Dakota.

Regarding the comments related to the absence of mention of the gray wolf, Canada lynx, mountain lion, and bear, we assume these suggestions relate to the Plan's species of greatest conservation need list. Because so much of the Plan materials rely on the SGCN, that list was finalized earlier in the planning process, with specific agency, tribal, and public opportunities to comment. We did not receive these suggested additions during that comment period, and these species were not proposed as SGCN because the Planning Team and those consulted (species and taxa experts, tribes, agencies, and the public) did not recommend them as fitting the selection criteria.

South Dakota Wildlife Action Plan



South Dakota Wildlife Action Plan

Appendix W (continued). Comments received during Plan review period (May 7 – June 6, 2014) and associated resolution of suggested input.

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718
June 6th, 2014

To SD Game, Fish and Parks,

Our second comment letter on the Wildlife Action Plan (2014 Draft)

We attach Steve Forrest's Defenders of Wildlife's comments on the Wildlife Action Plan and concur and agree with Steve and incorporate by reference.

We also ask that SDGFP include Northern Plains Conservation Network (NPCN - <http://www.npcn.net/>) in the list of initiatives addressing conservation interests in South Dakota.

Prairie Hills Audubon Society has been a participant in NPCN for over 10 years and as one of the long term participants, we helped plan, review and approve the Ocean of

Grass Assessment: <http://www.protectedareas.info/upload/document/ecoregionplan-northerngreatplainconservationassessmentsummary.pdf>, (Forrest et al 2004).

We take pride in this document and hope you will review and include it. NPCN has various charts and interactive maps on the web site currently

- <http://www.npcn.net/npcnWebmap/index.html>

The National Audubon Society has been working on an Important Bird Area Program for SD, which I think might be finished, or almost finished. I am not sure when the public release will be, but I hope some time soon.

Marshall Johnson the staff of Audubon Dakota will know about the release date (<mejohanson@audubon.org>)

I believe the National Audubon Society is also working on a model that predicts the effects of climate change on birds in three future climate scenarios.

I don't know when that will have a public release, the web site says maybe October, but I hope that will also be helpful to you once released.

I assume Marshall will have updates about the release date. But to read about it visit:

http://www.audubonaction.org/site/News2?abbr=aa_&page=NewsArticle&id=5717&pgwrap=n#skip_in_terests

Thanks,

Nancy Hilding.
President
Prairie Hills Audubon Society

South Dakota Wildlife Action Plan

=====

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SDGFP response:

- See response to Defenders of Wildlife comment letter earlier in this appendix.
- The Northern Plains Conservation Network has been added to the list of conservation initiatives in the Plan.
- The National Audubon Society's IBA program was already listed as a conservation initiative.
- Many organizations host climate change information on their sites, and we appreciate hearing about the NAS information. Rather than listing just one source of climate change impact predictions and neglecting to list others, we encourage the public to seek out information from websites, authorities, and organizations they trust.