NEW FUNDING FOR SOUTH DAKOTA'S FISH AND WILDLIFE

WILDLIFE RESTORATION AND CONSERVATION PROGRAM AND STATE WILDLIFE GRANTS

updated December 2011

European settlers in North America found and exploited a wealth of natural resources, including abundant wildlife populations. Species such as the American bison, pronghorn, wild turkey, and white-tailed deer were decimated by the early 1900s and others, such as the passenger pigeon, eastern elk, Audubon's bighorn sheep, and Carolina parakeet, were lost forever to extinction. Fearing further losses, hunters led a new movement of wildlife conservation, which included new hunting ethics, the science of wildlife management, and protection measures.

To fund this movement, Congress passed the 1937 Wildlife Restoration Act, also known as the Pittman-Robertson Act, which imposed a 10% manufacturers tax on hunting ammunition and firearms. Tax proceeds are distributed to state fish and wildlife agencies for research, habitat protection, and species recovery. Anglers followed suit in 1950, urging passage of the Sport Fish Restoration Act, also called the Dingell-Johnson Act. The D-J Act placed a 10% manufacturers tax on fishing rods, reels, and tackle to be distributed to state fish and wildlife agencies for sport fish restoration. The Wallop-Breaux Amendment was passed in 1984 to expand the D-J Act by including boating and angling gear for financial support of recreation access and education programs.

While P-R and D-J funding helped address the needs of game birds and mammals and sport fish, nongame and endangered species funding needs have not been linked with a similar funding solution. Endangered Species Act funds have helped recover some well-known species, such as the bald eagle, peregrine falcon, and black-footed ferret. Such efforts are extremely expensive, and most wildlife advocates agree that preventive action is the answer to assure the future of America's fish and wildlife resources.

Teaming with Wildlife is a legislative effort to identify and secure a stable, long-term funding source for fish and wildlife species that have fallen through the cracks when it comes to funding. A better coordinated approach of inventories, management, and related educational efforts can help prevent future endangered species listing and help state wildlife agencies fulfill their trust responsibility to manage for the needs of all wildlife species.

In the meantime, Congress approved two major appropriations to address these funding shortfalls. This document summarizes South Dakota projects funded with these new federal dollars.

WILDLIFE CONSERVATION AND RESTORATION PROGRAM

This one-time appropriation was welcomed in South Dakota, since it was patterned after Teaming with Wildlife's three-pronged emphasis on wildlife management, environmental education, and wildlife-associated recreation. SDGFP was able to fund projects with matching federal funds that had not been possible before.

PROJECT LIST, WILDLIFE CONSERVATION & RESTORATION PROGRAM (chronological)

1. Wild turtles of South Dakota inventory
2. Development of bird conservation plan for South Dakota
3. Gating of abandoned mines and caves in the Black Hills to preserve and protect bat roosting habitat
4. Wildlife observation enhancement at the Adams Homestead and Nature Preserve
5. Pilot program to implement and coordinate volunteer, nongame monitoring programs in SD.
6. Reintroduction of osprey into suitable sites along the Missouri River in SD.
7. Macroinvertebrate bioassessment of Black Hills streams
8. Raptor management in the Black Hills
9. South Dakota state park nature education enhancement
10. Revision of "Fragile Legacy" booklet on rare animal species in South Dakota
11. Upgrade and conversion of South Dakota Natural Heritage Database
12. Publication of a book on herpetofauna (reptiles and amphibians) of South Dakota
13. LaFramboise Island wildlife habitat restoration and enhancement plan
14. Native grass plantings in South Dakota state parks

STATE WILDLIFE GRANTS

The most recent annual funding source for rare species conservation work by state, tribal, and territorial wildlife agencies is called State (or Tribal) Wildlife Grants. State Wildlife Grants (SWG) projects must help implement a state's Wildlife Action Plan. All states and territories prepared comprehensive wildlife conservation plans (http://gfp.sd.gov/wildlife/management/plans/wildlife-action-plan.aspx) in return for receiving State Wildlife Grants funding to address the long-term needs of all fish and wildlife species.

PROJECT LIST (chronological)

15. Survey rare animal species at representative public areas in South Dakota
16. Enhance wildlife habitat provided by aspen in Custer State Park
17. Black-backed and Lewis's woodpeckers responses to fire
18. An evaluation of nesting success of grassland birds in mixed grass prairie in SD
19. Development of South Dakota's comprehensive wildlife conservation plan
20. Ecology of the Black Hills redbelly snake
21. Herpetology surveys
22. Use of aquatic GAP analysis to help conserve fish species at risk in South Dakota streams
23. Examination of Black Hills *Oreohelix* snails
24. Topeka shiner monitoring in eastern South Dakota streams
25. Nesting success, brood survival, and movements of long-billed curlews in grazed landscapes of western SD
26. Statewide colonial and semi-colonial waterbird inventory with a plan for long-term monitoring
27. Examination of the northern flying squirrel in the Black Hills and northeastern SD
28. Bat habitat protection and evaluation
29. Monitoring the American burying beetle in South Dakota
30. Monitoring butterfly species of concern in South Dakota
31. Monitoring American dippers in the Black Hills
32. Comprehensive aquatics survey of the Minnesota River tributaries
33. Biology of American three-toed woodpeckers in the Black Hills
34. Reintroduction of osprey into suitable sites along the Missouri River in South Dakota

35. Assessing the impacts of tree plantings on grassland birds in South Dakota
36. Monitoring herpetofauna in South Dakota
37. Distribution and monitoring of bat species along the lower Missouri River
38. Does prairie dog colony size matter? Implications for the conservation of grassland biota in SD
39. Development and application of a habitat assessment tool for juvenile pallid sturgeon in the upper Missouri River
40. Genetic variation in the smooth green snake in South Dakota
41. Restoring swift foxes to the Bad River Ranches and environs in western South Dakota
42. Wildlife habitat inventory on game production areas in eastern South Dakota
43. Exploration of factors that influence productivity of American White Pelicans at Bitter Lake in northeastern SD
44. Mapping big sagebrush vegetation in western South Dakota
45. Population estimates, habitat relationships, and movement patterns of turtles in southeastern SD
46. Testing the ecosystem diversity approach of South Dakota's Wildlife Action Plan
47. Avian monitoring in the Black Hills
48. An aquatic invasive species risk assessment for South Dakota
49. An evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota
50. Estimating conversion of native grassland to cropland in South Dakota: Loss of habitat for grassland-nesting birds
51. Understanding the relationship between prairie dog ecology and black-footed ferret resource selection
52. Assessment, monitoring and protection of bat habitats in western South Dakota
53. What factors affect territoriality and productivity of black-footed ferrets
54. Importance of mountain pine beetle infestations and fire as Black-backed Woodpecker habitat in the Black Hills, South Dakota
55. Nesting success of tree-nesting waterbirds in colonies on selected wetlands in northeast South Dakota
56. South Dakota Breeding Bird Atlas 2
57. Conservation status of the mountain sucker in South Dakota
58. Evaluation of timber harvest on nongame bird abundance and diversity in Custer State Park, SD

59. Prevalence of an emerging disease in South Dakota amphibian populations
60. Classification and mapping of riparian vegetation along the Big Sioux River
61. Burrowing owl distribution in western South Dakota
62. Biodiversity inventory of native bees in the Black Hills Ecoregion
63. Distribution and lek locations of greater prairie-chickens and sharp-tailed grouse outside of their traditional range in South Dakota
64. Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region
65. Topeka shiner monitoring in eastern South Dakota streams (round two)
66. Faunal survey of the delta habitat of Upper Lewis and Clark Lake
67. Status of the Bear Lodge meadow jumping mouse (*Zapus hudsonius campestris*) in South Dakota
68. Distribution, abundance, and seasonal habitat use patterns of ornate box turtles in South Dakota
69. Survey and mapping of Black Hills montane grasslands
70. Evaluation of artificial bat roost selection and occupancy in South Dakota ecoregions
71. Mapping and characterization of calcareous fens in eastern South Dakota
72. Revision of South Dakota comprehensive wildlife plan
73. Reintroduction of peregrine falcon in South Dakota
74. Preliminary investigation into migratory movements of bats in South Dakota
75. Classification and mapping of riparian forest along the White River in South Dakota
76. Past and current vegetation conditions of core sagebrush habitat and leks of greater sage-grouse in western South Dakota
77. Colonial and semi-colonial waterbird monitoring
78. Status and distribution of Franklin's ground squirrels and Richardson's ground squirrels in eastern SD
79. Black-footed ferret habitat enhancement in Conata Basin, South Dakota
80. Determination of river otter distribution and evaluation of potential sites for population expansion in SD
81. Development of a long-term grassland songbird monitoring program for South Dakota with an emphasis on Species of Greatest Conservation Need
82. Threats, management, and suggested harvest and collection policy of herpetofauna of South Dakota

PROJECT LIST (by subject area)

Birds

6. Reintroduction of osprey into suitable sites along the Missouri River in SD
8. Raptor management in the Black Hills
17. Black-backed and Lewis's woodpeckers responses to fire
18. An evaluation of nesting success of grassland birds in mixed grass prairie in SD
25. Nesting success, brood survival, and movements of long-billed curlews in grazed landscapes of western SD
31. Monitoring American dippers in the Black Hills
33. Biology of American three-toed woodpeckers in the Black Hills
34. Reintroduction of osprey into suitable sites along the Missouri River in South Dakota
35. Assessing the impacts of tree plantings on grassland birds in South Dakota
43. Exploration of factors that influence productivity of American white pelicans at Bitter Lake in northeastern SD
47. Avian monitoring in the Black Hills
49. An evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota
54. Importance of mountain pine beetle infestations and fire as Black-backed Woodpecker habitat in the Black Hills, South Dakota
55. Nesting success of tree-nesting waterbirds in colonies on selected wetlands in northeast South Dakota
58. Evaluation of timber harvest on nongame bird abundance and diversity in Custer State Park, SD
61. Burrowing owl distribution in western South Dakota
63. Distribution and lek locations of greater prairie-chickens and sharp-tailed grouse outside of their traditional range in South Dakota
73. Reintroduction of peregrine falcon in South Dakota
76. Past and current vegetation conditions of core sagebrush habitat and leks of greater sage-grouse in western South Dakota

Fishes

22. Use of aquatic GAP analysis to help conserve fish species at risk in South Dakota streams
24. Topeka shiner monitoring in eastern South Dakota streams
39. Development and application of a habitat assessment tool for juvenile pallid sturgeon in the upper Missouri River
57. Conservation status of the mountain sucker in South Dakota
64. Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region
65. Topeka shiner monitoring in eastern South Dakota streams (round two)

Habitat Inventory or Enhancement

14. Native grass plantings in South Dakota state parks
16. Enhance wildlife habitat provided by aspen in Custer State Park
42. Wildlife habitat inventory on game production areas in eastern South Dakota
44. Mapping big sagebrush vegetation in western South Dakota
46. Testing the ecosystem diversity approach of South Dakota's Wildlife Action Plan
50. Estimating conversion of native grassland to cropland in South Dakota: Loss of habitat for grassland-nesting birds
60. Classification and mapping of riparian vegetation along the Big Sioux River
69. Survey and mapping of Black Hills montane grasslands
71. Mapping and characterization of calcareous fens in eastern South Dakota
75. Classification and mapping of riparian forest along the White River in South Dakota
79. Black-footed ferret habitat enhancement in Conata Basin, South Dakota

Herptiles

1. Wild turtles of South Dakota inventory
20. Ecology of the Black Hills redbelly snake
21. Herpetology surveys
36. Monitoring herpetofauna in South Dakota
40. Genetic variation in the smooth green snake in South Dakota
45. Population estimates, habitat relationships, and movement patterns of turtles in southeastern SD
59. Prevalence of an emerging disease in South Dakota amphibian populations
68. Distribution, abundance, and seasonal habitat use patterns of ornate box turtles in South Dakota
82. Threats, management, and suggested harvest and collection policy of herpetofauna of South Dakota

Invertebrates

7. Macroinvertebrate bioassessment of Black Hills streams
23. Examination of Black Hills *Oreohelix* snails
29. Monitoring the American burying beetle in South Dakota
30. Monitoring butterfly species of concern in South Dakota
62. Biodiversity inventory of native bees in the Black Hills Ecoregion

Mammals

3. Gating of abandoned mines and caves in the Black Hills to preserve and protect bat roosting habitat
27. Examination of the northern flying squirrel in the Black Hills and northeastern SD
28. Bat habitat protection and evaluation
37. Distribution and monitoring of bat species along the lower Missouri River
38. Does prairie dog colony size matter? Implications for the conservation of grassland biota in SD
41. Restoring swift foxes to the Bad River Ranches and environs in western South Dakota
51. Understanding the relationship between prairie dog ecology and black-footed ferret resource selection
52. Assessment, monitoring and protection of bat habitats in western South Dakota
53. What factors affect territoriality and productivity of black-footed ferrets
67. Status of the Bear Lodge meadow jumping mouse (*Zapus hudsonius campestris*) in South Dakota
70. Evaluation of artificial bat roost selection and occupancy in South Dakota ecoregions
74. Preliminary investigation into migratory movements of bats in South Dakota
78. Status and distribution of Franklin's ground squirrels and Richardson's ground squirrels in eastern SD
80. Determination of river otter distribution and evaluation of potential sites for population expansion in SD

Planning

2. Development of bird conservation plan for South Dakota
11. Upgrade and conversion of South Dakota Natural Heritage Database
13. LaFramboise Island wildlife habitat restoration and enhancement plan
19. Development of South Dakota's comprehensive wildlife conservation plan
48. An aquatic invasive species risk assessment for South Dakota
72. Revision of South Dakota comprehensive wildlife plan
81. Development of a long-term grassland songbird monitoring program for South Dakota with an emphasis on Species of Greatest Conservation Need

Watchable Wildlife or Education

(These projects were completed with Wildlife Conservation and Restoration Program funding. Projects in this subject area are not eligible for State Wildlife Grants funding.)

4. Wildlife observation enhancement at the Adams Homestead and Nature Preserve
5. Pilot program to implement and coordinate volunteer, nongame monitoring programs in South Dakota
9. South Dakota state park nature education enhancement
10. Revision of "Fragile Legacy" booklet on rare animal species in South Dakota
12. Publication of a book on herpetofauna (reptiles and amphibians) of South Dakota

Wildlife Survey or Monitoring

15. Survey rare animal species at representative public areas in South Dakota
26. Statewide colonial and semi-colonial waterbird inventory with a plan for long-term monitoring
32. Comprehensive aquatics survey of the Minnesota River tributaries
56. South Dakota Breeding Bird Atlas 2
66. Faunal survey of the delta habitat of Upper Lewis and Clark Lake
77. Colonial and semi-colonial waterbird monitoring

September 2010 marked the 10-year anniversary for State Wildlife Grants to state wildlife agencies. SDGFP is proud of its accomplishments with this federal match source and appreciates the efforts of the South Dakota Teaming with Wildlife coalition for supporting wildlife and natural places.

Visit http://gfp.sd.gov/wildlife/funding/teaming.aspx to join South Dakota's Teaming with Wildlife Coalition.

1. Wild turtles of South Dakota inventory

Graduate student Sarah Bandas completed a Master of Science project at South Dakota State University under a SDGFP contract. This statewide inventory of the 9 turtle species found in the state was the first of its kind in South Dakota. Six of seven species thought to occur in the state were documented; Blanding's turtle was not found.

Results from this study provided information for a new publication called "A Field Guide to South Dakota Turtles," available at this website:

http://pubstorage.sdstate.edu/AgBio_Publications/articles/EC919.pdf

Photo of smooth softshell by Doug Backlund

2. Development of bird conservation plan for South Dakota

A national bird conservation planning effort, called Partners in Flight, has brought much attention to the unmet needs of birds, particularly those not covered by current conservation initiatives. A South Dakota ornithologist, Dr. Kristel Bakker of Dakota State University, was contracted by SDGFP to draft an all-bird management plan for the state. The management plan can be viewed at this site: http://gfp.sd.gov/wildlife/docs/bird-plan.pdf

To learn more about national bird initiatives, visit: http://www.partnersinflight.org/

3. Gating of abandoned mines and caves in the Black Hills to preserve and protect bat roosting habitat

At least 11 bat species live in the Black Hills, and 8 of them depend on underground roosting sites, such as caves or mines, for their survival. Such areas are increasingly vulnerable to loss from natural erosion around the entrance or from impacts of intentional or accidental disturbance. Many abandoned mines have been permanently sealed for liability reasons without first determining whether bats use the site. SDGFP contracted with Joel Tigner of Batworks in Rapid City to identify and categorize natural caves and abandoned mines for their importance to bats and install vandal resistant, bat friendly gates at important roost sites.

All 8 species have shown acceptance of these specially designed bat gates at their roosts.

Photo by Joel Tigner of a bat gate installed at a Black Hills cave

4. Wildlife observation enhancement at the Adams Homestead & Nature Preserve

This southeastern SD property was acquired as a joint venture between SDGFP's Wildlife Division, Parks Division, and the SD Parks and Wildlife Foundation. This cooperative spirit has continued with Wildlife Conservation and Restoration Program-funded purchases of binoculars, spotting scopes, wildlife ID guides, a portable wildlife viewing blind, and a motorized cart for visitors with special needs.

5. Pilot program to implement and coordinate volunteer, nongame monitoring programs in South Dakota

Wildlife Conservation and Restoration Program funding allowed SDGFP to explore a new approach to citizen science that has proven successful in many states and local communities. SDGFP contracted with two individuals to develop and assess several pilot programs that use volunteers to collect wildlife abundance and habitat information in South Dakota. Denis Hofflander and John Landegent worked with interested volunteers and conservation organizations in southeastern South Dakota. Their efforts concluded in December 2004, and SDGFP can use this example to evaluate if this pilot program should be made a long-term agency effort.

6. Reintroduction of osprey into suitable sites along the Missouri River in SD

Nine osprey chicks were reintroduced to two hack (reintroduction) sites along the Missouri River in southeastern South Dakota in 2003. This state threatened species currently nests only in the Black Hills and rarely in northeastern South Dakota, although it is common in other parts of the country. This effort will attempt to establish this fish-eating raptor in a new part of the state. Following the pilot project, SDGFP continued the work with State Wildlife Grants funding.

From 2004 - 2010, osprey chicks were brought from Idaho to the hack sites in Clay and Yankton counties, in cooperation with Wayne Melquist of the University of Idaho, raptor rehabilitator Jane Fink and biologist Don Johnson. Beginning in 2008, the effort focused on a new hack site along Lake Yankton near the Gavins Point Dam. No osprey have yet returned to nest in southeastern South Dakota, but we hope that some of the chicks will survive and return to these sites to establish territories and nest successfully.

Hack site along Lake Yankton in southeastern South Dakota.
Note young osprey on top horizontal post.
Photo by Eileen Dowd Stukel

Osprey chicks in hack box
Photo by Eileen Dowd Stukel

7. Macroinvertebrate bioassessment of Black Hills streams

Jeff Shearer, SDGFP aquatic ecologist, sampled 64 stream sites in the Black Hills to determine which invertebrate species were present in an attempt to develop a technique to use macroinvertebrates as a tool to monitor future changes in stream conditions. A variety of variables was examined, and six were found to have a strong correlation to habitat quality. The study did not include collection of water quality data. Refinement of the technique may include the addition of water quality information and identification of local-level habitat features that may influence macroinvertebrate populations and stream condition.

A copy of the final project report can be found here:
http://gfp.sd.gov/wildlife/management/diversity/docs/BH-InvertSurvey.pdf

8. Raptor management in the Black Hills

The Black Hills hosts an array of bird species. One bird group that has not received much attention is the birds of prey, or raptors. This project surveyed Black Hills habitats for breeding raptors with an emphasis on the northern goshawk and small forest owls. Surveys were conducted from 2003-2005. The northern saw-whet owl was the most common small forest owl detected. Despite some recent reports of flammulated owls and boreal owls in the Black Hills, no breeding populations were detected. Locations of 72 northern goshawk nest territories were obtained from the US Forest Service. All of these nest territories were investigated and only 8 were found active in 2003. An additional nest territory was located during systematic calling surveys in 2003. This was the only response to calling surveys out of 155 calling stations. By the end of the survey season in 2005, 14 northern goshawk nest territories had been located that were active in at least 1 of the 3 years.

Northern Saw-whet Owl photographed at Little Bend LUA by Doug Backlund

9. South Dakota state park nature education enhancement

This project made use of the educational component of Wildlife Conservation and Restoration Program funding by accomplishing the following:

1. Purchased educational materials for use in state parks, including 6 *Birds of South Dakota* books, 6 critter crates, 1 birder crate, 1 fish crate, and 1 insect crate.
2. Developed educational programs on South Dakota birds, fish, insects, plants and other wildlife.
3. Trained 12 seasonal park naturalists/programmers to conduct educational programs.
4. Restored grassland on 40 acres of cultivated land on the Adams Homestead and Nature Preserve to enhance wildlife educational programs.

10. Revision of "Fragile Legacy" booklet on rare animal species in SD

In 1991, SDGFP published *Fragile Legacy* to address the tremendous public interest in South Dakota's rare species. To request a free copy of this updated booklet, complete the request form at this site:
http://gfp.sd.gov/wildlife/critters/default.aspx

11. Upgrade and conversion of South Dakota Natural Heritage Database

The South Dakota Natural Heritage Database is part of an international network dedicated to the compilation of information about rare, threatened or endangered species and other unique natural features. A strength of the network is the use of standardized methods of entering and tracking data. The system was originally developed by The Nature Conservancy and is now operated by an organization named NatureServe. Wildlife Conservation and Restoration Program funding allowed SDGFP to upgrade its system to a newer GIS-based system to make the database a more user-friendly tool in land management planning and in making use of rare species locational information.

12. Publication of a book on reptiles and amphibians of SD

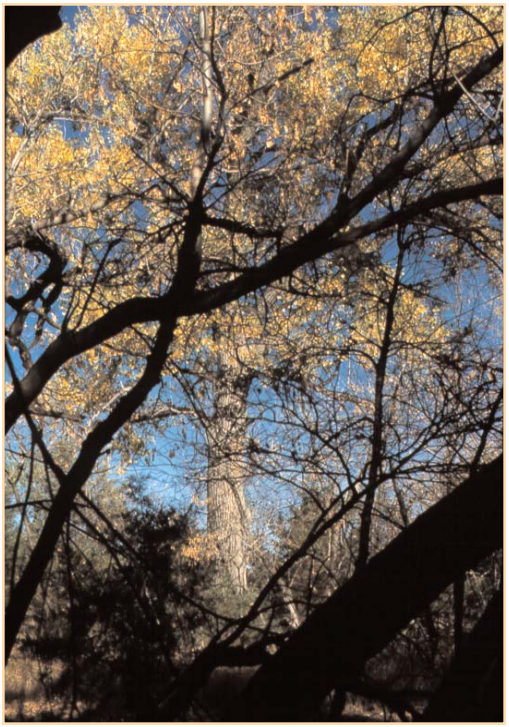
SDGFP and South Dakota State University have published booklets about South Dakota's snakes, frogs, toads, and turtles, but no single source covered the state's reptiles and amphibians. The supply of the first printing of the "Field Guide to Amphibians and Reptiles of South Dakota" has been exhausted, but SDGFP plans to reprint this guide soon. Two guides produced by SDSU can be downloaded at this site:
http://gfp.sd.gov/wildlife/critters/amphibians-reptiles/default.aspx

13. LaFramboise Island wildlife habitat restoration and enhancement plan

LaFramboise Island Nature Area is managed by SDGFP Parks Division as part of a recent transfer of certain lands along the Missouri River from federal to state ownership. This area contains a remnant cottonwood floodplain forest, an increasingly rare habitat that is extremely important to resident, wintering, and migratory wildlife species. In addition to the lack of natural flooding, the cottonwood forest is threatened by invasion of exotic plant species, increasing water levels and related sedimentation, beaver damage, and depredation by deer and cottontails. This project's main focus is on the needs of rare species, such as wintering bald eagles, while also incorporating other compatible wildlife uses of the area.

Botanist Dave Ode investigated the vegetational changes that have occurred on this island and summarized his findings and recommendations for enhanced wildlife habitat management on the island in a report titled: "Wildlife habitats of LaFramboise Island: Vegetational changes and management of a Missouri River island."

The report can be accessed at this site: http://gfp.sd.gov/wildlife/docs/laframboise-habitat.pdf



LaFramboise Island photos by Dave Ode

14. Native grass plantings in South Dakota state parks

These funds allowed native grass plantings on 128 acres of previously tilled land to stands more similar to tallgrass prairie, while also reducing nonnative plants. Plantings were done at five state parks, with replanted areas ranging in size from 14-40 acres. Sites included Lake Louise (Hand County), Newton Hills (Lincoln County), Oakwood Lakes (Brookings County), Lake Poinsett (Hamlin County), and Beaver Creek (Minnehaha County). These plantings will enhance wildlife habitat for game and nongame species and provide better interpretive opportunities for park visitors.

15. Survey rare animal species at representative public areas in SD

A biodiversity bioblitz is an intensive biological survey of an area, using both scientific experts and interested volunteers. A bioblitz is a way of getting a snapshot view of a site while generating the public's interest and increasing their knowledge of the natural world. Project objectives were to survey animal species of greatest conservation need at four publicly-owned areas in eastern South Dakota, draw attention to these species, teach methods used to conduct biological surveys, and compile a set of survey protocols that can be applied to other animal species surveys. This project was contracted to the Wildlife and Fisheries Sciences Department (SD Cooperative Fish and Wildlife Research Unit) at SDSU under the direction of Dr. Ken Higgins as a test of whether the technique might be useful in other parts of the state. Several hundred people attended South Dakota's first bioblitz, held on June 21, 2003 at 4 areas in Brookings County - Oakwood Lakes State Park, East and West Oakwood Lakes Game Production Areas, and Goodfellow Waterfowl Production Area. Five hundred different types of birds, mammals, fish, plants, or insects were documented.

16. Enhance wildlife habitat provided by aspen in Custer State Park

Custer State Park is a favorite destination of state residents and visitors, who come to enjoy its beauty and abundant wildlife. Aspen stands are a special vegetation community that provides habitat for many game and nongame wildlife species including ruffed grouse, red-naped sapsuckers, warbling vireos, MacGillivray's warblers and ovenbirds. Aspen stands are succeeding to conifers in the Black Hills, and regeneration is needed to sustain the diverse aspen-dependent wildlife communities. Thirteen aspen clones were fenced to protect aspen suckers from wildlife browsing, and 8 additional sites were treated to stop pine encroachment. An aspen master burning plan was also completed for CSP.

Aspen stand photo by Dave Ode
Primary SDGFP contact: Gary Brundige

17. Black-backed and Lewis's Woodpeckers responses to fire

These rare Black Hills woodpeckers respond positively to fires, which create snags (dead or dying trees) needed for nesting habitat, but little is known about their specific needs. This study was conducted by Dr. Kerri Vierling of the SD School of Mines and Technology. Objectives were to determine habitat preferences of cavity nesters within the Jasper fire site and to monitor reproductive activities of rare woodpeckers in post-fire environments.

Highlights of the study's results:
* Seven woodpecker species were found in the burn site; Hairy woodpeckers were most common. Lewis's woodpecker was the least common.
* Whether snags were occupied by woodpeckers depended greatly on the diameter of the nest tree.
* The leading causes of nest failures for the black-backed woodpecker were predation and snag breakage.

Black-backed woodpecker photo by Doug Backlund

18. An evaluation of nesting success of grassland birds in mixed grass prairie in SD

Grassland birds are declining at a faster rate than any other North American bird group. Many grasslands have been converted for other uses, fragmented into smaller pieces, or degraded by invasion of exotic species. This study focused on determining relationships between habitat size and nesting grassland species. Dr. Kristel Bakker of Dakota State University and Dr. Ken Higgins co-led this , which will help land managers determine how large grassland areas should be, how they should be arranged within a landscape, and where grassland protection measures might have the greatest positive impact on grassland birds.

Master of Science student Gillian Berman completed her M.S. Thesis in 2007. Highlights from the study include:
* Larger grassland patches were positively correlated with daily survival of chestnut-collared longspurs and dabbling ducks.
* Nest parasitism rates of savannah and grasshopper sparrow nests decreased in large grassland patches.
* Landscapes with >50% grassland habitat produced higher daily nest survival rates for western meadowlarks, savannah sparrows and grasshopper sparrows.
* To benefit grassland birds, land managers should pre-

serve large, intact areas of native prairie and, if such areas are not available, preserve smaller prairie patches, particularly those with a high percentage of remaining grassland.

19. Development of South Dakota's comprehensive wildlife conservation plan

In exchange for accepting Wildlife Conservation and Restoration Program and State Wildlife Grants funds, SDGFP prepared and submitted a Comprehensive Wildlife Conservation Plan for South Dakota to the U.S. Fish and Wildlife Service. The Plan was approved, and it is now known as the South Dakota Wildlife Action Plan.

The plans were tailored to each state's needs, but acceptance required that the plans address certain topics, such as wildlife distribution and abundance; key habitats; threats to wildlife and the habitats they need; methods to address these threats; plans for monitoring species and habitats; a procedure to review and update the plan and details about coordination with tribes and other entities with the potential to impact wildlife species and their habitats. The plans are intended to provide frameworks to encourage a more coordinated and proactive approach to wildlife management.

SDGFP worked with wildlife experts in the state and region to identify 90 wildlife species that fit one of three criteria; species that are state or federal listed as threatened or endangered, species for which South Dakota represents a large portion of the species' overall range and species that indicate or depend on a declining or unique habitat in South Dakota. Because it is impractical to write separate plans for each of the 90 species, South Dakota used an ecological planning approach by describing historical conditions (pre-European settlement) and the major processes (disturbances such as fire or grazing) that impacted plant communities.

Using the best information available, we described current habitats. An underlying assumption of this approach is that the needs of most species will be accommodated if South Dakota has a sufficient representation of native habitats.

South Dakota's Comprehensive Wildlife Conservation Plan takes a broad view of landscapes from a fish and wildlife perspective. The plan considers:

* What are South Dakota's essential habitats, and where are they?
* What habitats have changed since South Dakota was settled?
* Which animals need special attention to ensure their long-term survival?
* How can we be more proactive in wildlife and habitat management?

South Dakota's Wildlife Action Plan fulfills a promise made in exchange for new wildlife funding. South Dakota's approach will help avoid future endangered species issues, but just as importantly, it offers an opportunity to energize diverse partners in providing land and resource stewardship to help wildlife and conserve South Dakota's special natural places.

SDGFP completed a related project to test the ecosystem diversity approach in grasslands within the Missouri Coteau in northcentral South Dakota, which is described later in this document.

Plan CDs are available from SDGFP upon request.

20. Ecology of the Black Hills redbelly snake

Redbelly snakes range from parts of southern Canada throughout much of the eastern U.S., but one subspecies is found only in the Black Hills of Wyoming and South Dakota. Basic information is needed to assure that land and resource managers can avoid harming this animal. Project leader was Dr. Chuck Dieter, South Dakota State University. Meagan Hall was the graduate research assistant. Objectives included determining seasonal activity, reproductive characteristics, habitat selection, distribution, food habits, and the influence of prey abundance on Black Hills redbelly snake populations.

Study highlights included:
* Snakes were captured at a rate of 1.03 animals/person hour during 2004 and 1.76 snakes/person hour during 2005.
* A total of 250 redbelly snakes were found during the study.
* The most important food items were slugs and earthworms.
* Prey availability in the Black Hills did not negatively impact Black Hills redbelly snakes in this study.

This project concluded in 2006.

Redbelly snake photo by Doug Backlund

21. Herpetology surveys

State Wildlife Grants have allowed an expansion in inventory and research efforts that were not possible with SDGFP's traditional funding sources. An example is new data collection on South Dakota's reptiles and amphibians, also known as herpetiles or herps. Several recent discoveries have highlighted the need for a more systematic effort to gather solid baseline data in South Dakota.

Ten priority sites were selected for inventories of all herps, with an emphasis on rare reptiles and amphibians. Experienced field biologists used a number of techniques to survey priority areas in western South Dakota river systems, sand dune habitats of southcentral South Dakota, sagebrush habitats, the Black Hills, and wetland habitats along the Missouri River.

Survey highlights included:
* A total of 1,773 new records for rare herp species were generated for the South Dakota Natural Heritage Database.
* Twenty-six wood frog sites were found in northeastern South Dakota; only one site was previously known.
* The first documented wandering garter snake outside the Black Hills was found in Harding County.
* The status of many species, both rare and common, is now much better known in the state. Survey sites can be revisited in the future to monitor how herp species are doing and to hopefully detect problems before they become too serious.

Photo of short-horned lizard by Doug Backlund

22. Use of aquatic GAP analysis to help conserve fish species at risk in SD streams

Aquatic GAP is a tool that uses biological data, remote sensing, and geographic information systems to predict where fish or wildlife species might find suitable habitat and where conservation programs can best be used to protect rare species and biodiversity. It is important to test these predictions with field data. This study was contracted to the Wildlife and Fisheries Department (SD Cooperative Fish and Wildlife Research Unit) at SDSU under the direction of Dr. Chuck Berry, with assistance from Cari-Ann Hayer and Steven Wall. The study's goal was to survey streams and watersheds with historic occurrences of rare fish species and those wetlands identified by aquatic GAP as having potential habitat for rare species. Data were also collected on habitat and community associations of rare species.

Fish were collected at 143 sites. The northern redbelly dace model had the most agreement with field data; model agreement for other target species was moderate or fair. For species with high model agreement, conservation practices can be targeted to areas where these species are likely to occur.

Learn more about SD's Aquatic GAP:
http://www.sdstate.edu/nrm/gap/aquatic/index.cfm

23. Examination of Black Hills *Oreohelix* snails

One of the most significant features of State Wildlife Grants funding is that projects dealing with invertebrate species are eligible for funding. This has allowed SDGFP to better fulfill its responsibility to manage for the needs of all wildlife species.

Several types of land snails occur in the Black Hills of South Dakota and Wyoming. One species, Cooper's rocky mountainsnail (*Oreohelix strigosa cooperi*), was petitioned for federal listing under the Endangered Species Act, but many questions remain as to whether this is a valid species and whether the Black Hills population is unique. Dr. Tamara Anderson, Adjunct Curator at University of Colorado Museum, led the study and concluded that *Oreohelix* snails in the Black Hills are all one species and are most similar to a population found in the Big Horn Mountains of Wyoming.

24. Topeka shiner monitoring in eastern South Dakota streams

This fish species was listed as federal endangered in 1999, based on the decline and loss of populations in the southern part of the species' range and the assumption that the species needed federal protection. Subsequent surveys have proven that South Dakota's Topeka shiner populations are doing well. The State of South Dakota was successful in receiving an exemption from critical habitat designation for this species. South Dakota has made other commitments to the Topeka shiner in the state management plan (Topeka Shiner {*Notropis topeka*} Management Plan for the State of South Dakota), including a commitment to develop and implement a 3-year monitoring program in 11 watersheds in the state. This study is providing baseline data to help monitor populations and their habitats and to evaluate the goals outlined in South Dakota's state plan.

A total of 33 sites were evaluated during the 3-year program, with Topeka shiners documented in 76% of sampled sites and at 87% of resampled sites. This baseline study will allow future studies to assess changes in stream habitat and fish communities, allowing comparisons at the site, stream or basin level.

Topeka shiner state management plan:
http://gfp.sd.gov/wildlife/management/plans/topeka-shiner-plan.aspx

25. Nesting success, brood survival, and movements of Long-billed Curlews in grazed landscapes of western South Dakota

Photo of long-billed curlew by Doug Backlund

The long-billed curlew is North America's largest shorebird. This grassland-dependent bird is an uncommon breeder in western South Dakota. This study, led by Dr. Kent (K.C.) Jensen of South Dakota State University and conducted by graduate student Jessica (Nan) Clarke, was designed to give us a better understanding of the effects of grazing regimes on long-billed curlew movements, nesting habits and success, and food availability. Results will help land managers accommodate the needs of this unique grassland species.

An M.S. Thesis was completed in 2006, with the following highlights:
* 48 nests were located and 43 adult curlews were radio-marked during the study.
* The second year of the study was impacted by a natural range fire on the study site and severe drought conditions; nest predation accounted for 64% of nest failures in 2006.
* Curlews selected nest sites with more junegrass and buffalograss and more forb cover than at random points.
* Only 1/3 of the broods produced by radio-marked curlews produced fledglings, possibly due to avian predation and heat prostration.

26. Statewide colonial and semi-colonial waterbird inventory with a plan for long-term monitoring

A major priority for State Wildlife Grants funding is to help prevent future endangered species listings. Collecting baseline information on the status of wildlife species is a critical step. In this project, SDGFP contracted with the Rocky Mountain Bird Observatory (RMBO) to conduct a statewide inventory of waterbird species that nest in colonies and to develop a monitoring system that SDGFP can use in future years to track the status of these species.

Photo of great blue heron by Doug Backlund

Project coordinator Nancy Drilling, RMBO, reported the following highlights:
* 40% of the 1025 sites surveyed had confirmed waterbird breeding during at least one year.
* 26 sites were identified as important waterbird colony areas, having more 200 total waterbird breeding pairs and/or more than 5 breeding species.
* Breeding was confirmed for 32 of the 46 targeted species.
* American white pelicans and double-crested cormorants were the most abundant nesting colonial waterbirds in South Dakota during the 3-year survey.
* Recommended monitoring includes monitoring known colonies and searching for new colonies, with use of citizen scientists for certain colonies.

This project concluded in 2007.

27. Examination of the northern flying squirrel in the Black Hills and northeastern South Dakota

The northern flying squirrel occurs in the Black Hills and in a portion of northeastern South Dakota. Dr. Chuck Dieter of South Dakota State University led a study to help us better understand habitat needs and certain ecological aspects of this species and the red squirrel in South Dakota. Dr. Hugh Britten of the University of South Dakota led research into genetic aspects of these squirrels. Graduate students included Melissa Hough and Alyssa Kiesow. Animals were fitted with radio transmitters to track movements and habitat use. Another facet of the study was an examination of northern flying squirrel food habits. This study concluded in 2008.

Highlights included:
* 59 flying squirrels were tracked with radio telemetry to 133 different den sites. Den sites were drays (nests) in live trees, cavities in live trees and cavities in snags.
* Flying squirrels preferred areas with larger trees and good canopy cover and preferred pine habitat to aspen birch and bur oak.
* Fungi, including truffles and false truffles, comprised more than 90% of the diet of flying squirrels in the Black Hills. Diet analysis was conducted by Dr. Audrey Gabel of Black Hills State University.
* Genetic analyses indicate adequate gene flow between populations within the Black Hills, but a lack of genetic exchange outside the Hills.

28. Bat habitat protection and evaluation: implementing and assessing management techniques

SDGFP has undertaken a variety of activities to raise awareness about bats' unique characteristics and to monitor and protect populations. A related effort was the completion of the South Dakota Bat Management Plan by the South Dakota Bat Working Group in 2004. This project helped address some of the commitments made in the management plan; helped evaluate the success of certain bat protection strategies, such as installation of bat-friendly gates at important maternity or hibernation sites; began the development of a library of echolocation calls for South Dakota bats; and produced a database of previous bat survey data to help direct future surveys and avoid duplication of efforts.

Photo of Townsend's big-eared bat by Joel Tigner

This project concluded in 2007.

Project leader Joel Tigner reported the following accomplishments:
* Surveys of bats at gated sites indicate acceptance of gates by bats.
* Identification of new sites for gate installation continued, using an assessment tool that considers biological and safety factors.
* Reference calls were collected during the course of the project; call collection will continue to build a call library for South Dakota to help identify individuals without capturing them.
* A database of bat survey data was compiled, and future survey data will be added to help guide inventory efforts and avoid duplicate surveys at sensitive areas.

View the SD bat management plan at this site:
http://gfp.sd.gov/wildlife/management/plans/bat-management-plan.aspx

29. Monitoring the American burying beetle in South Dakota
30. Monitoring butterfly species of concern in South Dakota
31. Monitoring American dippers in the Black Hills
32. Comprehensive aquatics survey of the Minnesota River tributaries

These projects involved monitoring species that are federal listed (American burying beetle), state listed (American dipper), indicators of habitat quality and abundance (various rare butterflies), or areas that have potential to host rare species (Minnesota River aquatics survey). Knowledge of population status is critical information to determine how best to recover rare species and to determine whether species need the additional protection of state or federal listing.

33. Biology of American Three-toed Woodpeckers in the Black Hills

The American three-toed woodpecker is a rare inhabitant of white spruce habitats of the Black Hills. This study was conducted by University of South Dakota researchers Dr. Dave Swanson, Dr. Hugh Britten and Amanda Ervin. The project was designed to provide information on population size, reproductive habits, habitat use, movements and genetic uniqueness of the Black Hills population, which is isolated from American three-toed woodpeckers found in the Rocky Mountains. This study concluded in 2009.

Important findings:
* Nesting success in the Black Hills was lower than in other parts of the species' range. Although causes of this finding are not known, several potential nest predators were observed, including red squirrels, least chipmunks and northern flying squirrels.
* Birds showed a relatively high incidence of aspen use for nesting cavities. Foraging birds preferred large spruce, both living and dead.
* DNA analysis indicated some gene flow between Rocky Mountain and Black Hills populations.

34. Reintroduction of osprey into suitable sites along the Missouri River in South Dakota

See the discussion in the Wildlife Conservation and Restoration Program project #6 description for a summary of this project.

35. Assessing the impacts of tree plantings on grassland birds in South Dakota

Grassland birds are declining faster than other bird groups, likely because of habitat conversion and fragmentation. Prior to settlement, trees and shrubs grew mainly along rivers and streams and other wetland edges. Tree plantings impact grassland birds by providing predator perches and habitat favorable to nest parasites such as the brown-headed cowbird and by fragmenting remaining grasslands into smaller pieces.

This study was conducted in cooperation with the U.S. Fish and Wildlife Service and the University of Montana under the leadership of Dr. David Naugle and PhD candidate Frank Quamen. The study's purpose was to evaluate whether grassland bird density is influenced by the presence of tree plantings by comparing bird densities at varying distances from tree plantings, by evaluating bird densities in grasslands with and without trees, and by evaluating changes in bird densities in areas before and after trees were removed.

Important results included:
* Bobolinks, savannah sparrows, and sedge wrens nested in lower densities near tree plantings than in grasslands lacking trees.
* Bobolinks and savannah sparrows occupied areas where trees were removed one year following removal, although Sedge wrens did not show such a clear response to tree removal.
* Clay-colored sparrows bred in higher densities near tree plantings than in grasslands lacking trees.
* Land managers wanting to manage for native grassland birds should remove remnant tree plantings from grassland sites and avoid establishing new plantings in or near grasslands to reduce the amount of edge provided, which provides access to nest parasites, such as the brown-headed cowbird.

This project concluded in 2006.

LeConte's sparrow photo by Doug Backlund

36. Monitoring reptiles and amphibians in South Dakota

Under SDGFP's previous federal funding sources, projects dealing with reptiles and amphibians were not eligible, so State Wildlife Grants funding has allowed much new work in this area. Two studies are being conducted under this general topic. The first project is a study of the seasonal status and distribution of the northern cricket frog in southeastern South Dakota, conducted by Dr. David Swanson and graduate student Seth Burdick of the University of South Dakota.

Important findings include:
* The species was found year-round in the James, Big Sioux and MIssouri Rivers, but was not found in the Vermillion River, where it occurred historically.
* Individuals hibernated in cracks in the mud along the James and Big Sioux rivers.
* These frogs showed a low tolerance to freezing; winter temperatures may limit their expansion in the state.

This study concluded in 2008.

Dr. Chuck Dieter and graduate student Laura Dixon investigated the status and distribution of turtles and turtle nests in southeastern South Dakota. Three turtle species were targeted; spiny and smooth softshells and false map turtle. Highlights of the study included:
* Predation rate of active nests was 36%.
* 62 nests of the target species were located, excavated for data collection and recovered in the area between Gavins Point Dam and Ponca State Park.
* Softshell clutch size averaged 14.5 eggs, and average nest depth was 9.1 cm.
* False map turtle clutch size averaged 10.8 eggs, and mean nest depth was 9.9 cm.
* These three species selected nesting areas with little or no vegetation and used sites created for least tern and piping plover nesting habitat, likely indicating a shortage of suitable turtle nesting habitat.

This study concluded in 2008.

Burrowing Owl photo by Doug Backlund
Primary SDGFP contact: Eileen Dowd Stukel

37. Distribution and monitoring of bat species along the lower Missouri River

Much of the survey work completed on South Dakota's bats has occurred in the Black Hills because of the presence of caves and abandoned mines. The Missouri River drainage also provides important habitat, particularly during migration. This study, conducted under project leader Dr. Scott Pedersen of South Dakota State University by graduate student Brandon Bales, examined bat distribution, habitat use, seasonal movements, and migratory patterns along the Missouri River. Techniques included mist-netting, acoustic surveys, and use of radio telemetry.

Study highlights included:
* 163 individual bats from 7 species were captured.
* Hoary and silver-haired bats are likely summer residents in the area, and western small-footed myotis may be present.
* Gallery forests dominated by plains cottonwoods are important bat habitats in this area.

This study concluded in 2007.

38. Does prairie dog colony size matter? Implications for the conservation of grassland biota in South Dakota

Much research has been conducted on prairie dogs, but questions remain. Among the unknowns: What colony size is needed to support burrowing owls and other species that depend on prairie dog colonies? This study was done in cooperation with the Turner Endangered Species Fund on the Bad River Ranches property in central South Dakota by graduate student Kristy Bly at Montana State University.

Study highlights included:
* Burrowing owl nests increased with prairie dog colony size, but nest densities declined. This may reflect the importance of other variables within or near the colonies.
* Burrowing owls preferred small colonies.
* Owls fledged a mean of 5.0 fledglings per total nests.
* Owls preferred to nest near colony perimeters.
* The study demonstrated the importance of maintaining many small- and medium-sized prairie dog colonies to maintain burrowing owls in this area.

The study concluded in 2007.

39. Development and application of a habitat assessment tool for juvenile pallid sturgeon in the upper Missouri River

The conversion of the Missouri River from a free-flowing river to a series of reservoirs produced both good and bad results. Flood control, irrigation supply, power generation, and recreation were positive results, but species that depended on the natural riverine habitat suffered greatly. The pallid sturgeon is a state and federal endangered species. This long-lived, bottom-dwelling species inhabits areas with strong currents and firm sand bottoms of large, turbid rivers. The loss of riverine habitats has caused a lack of natural reproduction, so recent recovery efforts have included hatchery propagation and reintroduction. This study was conducted under the leadership of Dr. Steve Chipps of the SD Cooperative Wildlife and Fisheries Research Unit at SDSU and was designed to provide a better understanding of the habitat needs and food habits of juvenile pallids in the Missouri River. Graduate students included Kristen (Berg) Grohs, Bryan Spindler, and Elizabeth Wright.

Research highlights included:
* A bioenergetics model was developed to estimate feeding and growth rates of juvenile pallid sturgeon to help assess fish growth, habitat suitability, and issues related to captive propagation of this species.
* Young pallids relied on invertebrates and fish prey, while fish prey was important for growth of larger juveniles.
* Sampling below Fort Randall Dam indicated that macroinvertebrates are important diet items for juvenile pallid sturgeon, rather than fish.
* Field evaluations in the Missouri River's Fort Randall Reach helped describe preferred habitats of juvenile pallids, which will assist in predicting habitat potential.
* Capture of pallids was influenced by presence of deeper water, sandy substrates and prey availability.

This study concluded in 2008.

40. Genetic variation in the smooth green snake in South Dakota

In South Dakota, the smooth green snake occurs in the Black Hills and in parts of the northeast and southeast. This species has declined in many parts of its range, and it is considered rare in South Dakota. This study was conducted to determine whether populations are genetically distinct within the state and distinct from smooth green snakes in other parts of the country. The project leader was Dr. Brian Smith of Black Hills State University.

Study highlights included:
* Smooth green snakes from the Black Hills and Ordway Prairie in South Dakota were not separate subspecies, although these populations differed genetically from each other.
* Smooth green snakes from the Black Hills and Bear Lodge Mountains populations are likely contiguous populations and are distinct from individuals sampled from Ordway Prairie.
* The species selects moist habitats, likely explaining its limited distribution in the northern Great Plains; it can be locally common in suitable habitats.

The study concluded in 2007.

41. Restoring swift foxes to the Bad River Ranches and environs in western South Dakota

The Turner Endangered Species Fund has worked to establish a self-sustaining swift fox population on the Bad River Ranches property and surrounding areas. This state threatened species has been translocated onto the property since 2002. Sadly, graduate student Kevin Honness died in June 2008. The project continued in association with the Wildlife and Fisheries Sciences Department at South Dakota State University, with Indrani Sasmal and Dr. Jon Jenks as the primary researchers.

Highlights of this effort to date include:
* Foxes were translocated from Colorado and Wyoming for release on Bad River Ranches and selected private lands near the central South Dakota property. An additional 46 pups born in captive soft-release pens were also released.
* The majority of known mortalities were caused by coyotes.
* During the pup-rearing season, female swift foxes selected areas with greater visibility, particularly grassland areas with sparse vegetation. Prairie dog towns were selected for prey availability and to help swift foxes avoid coyotes.

This project concluded in 2010.

42. Wildlife habitat inventory on game production areas in eastern South Dakota

SDGFP owns and maintains Game Production Areas (GPAs) to provide fish and wildlife habitat and to offer areas for hunting, angling, birdwatching, and other uses. Basic information on the distribution and abundance of native habitats is lacking for many of these areas. In particular, grassland habitat declines are seriously impacting birds and other wildlife species that depend on these habitats. This project involves mapping, categorizing, and making management recommendations for native grasslands and associated habitats on Game Production Areas in eastern South Dakota.

This work was contracted to Sustained Horizons LLC, which selected 128 GPAs in northeastern South Dakota for analysis. Polygons of upland vegetation were typed to "ecological site" vegetation and assigned qualitative and landscape ratings. Work began on GPAs in southeastern South Dakota in 2008. This regional analysis included an estimate of the invasion of cedar and other woody invaders into grassland parcels. Results of this project were summarized in a Geographic Information System layer for incorporation into Game Fish and Parks land management database.

The project concluded in 2009.

43. Exploration of factors that influence productivity of American White Pelicans at Bitter Lake in northeastern South Dakota

In 2002 and 2003, four American white pelican nesting colonies at Chase Lake in North Dakota experienced large dieoffs of young birds. During 2004, researchers with Northern Prairie Wildlife Research Center in Jamestown, North Dakota and USFWS refuge personnel observed complete abandonment of eggs and chicks by adult pelicans at Chase Lake, partial abandonment at Medicine Lake in Montana, and reduced productivity at Bitter Lake in South Dakota. State Wildlife Grants funding allowed monitoring of the Bitter Lake white pelican population to improve understanding of this species' ecology and to provide sound science for management decisions.

Field techniques included direct observations of colony activities, nest and chick counts, remote camera monitoring to collect behavioral information, use of satellite transmitters on adult pelicans to assess wetland use, chick banding, and blood sampling to detect prevalence

of West Nile virus and antibodies to the disease. Nest estimates at Bitter Lake were nearly 15,000 in 2007 and nearly 13,000 in 2008. Mortality causes included severe weather events, disturbance, West Nile Virus, and sibliicide. West Nile Virus was a particularly serious cause of chick loss during the later portion of the breeding seasons. Project leaders were Drs. Marsha Sovada and Pam Pietz, USGS, Northern Prairie Wildlife Research Center.

The study concluded in 2011.

American White Pelican photo by Doug Backlund

44. Mapping big sagebrush vegetation in western South Dakota

A variety of wildlife species depend on big sagebrush habitat, including pronghorn, sage grouse, sage thrasher, and Brewer's sparrow. Several sagebrush-associated species have been considered for listing under the federal Endangered Species Act, raising concern about the quantity and quality of remaining sagebrush habitat. This cooperative project with the Bureau of Reclamation and the Bureau of Land Management (BLM) involves mapping remaining stands of big sagebrush vegetation in western South Dakota. This baseline information will allow future comparisons to assess changes in sagebrush habitat and to help model areas where big sagebrush formerly occurred.

Digital, color-infrared imagery with one-foot pixels was flown in September 2006 in western Butte and Harding counties. Image processing and initial ground-truthing was performed by the Bureau of Reclamation's Remote Sensing and GIS Technical Center, resulting in a partial coverage of about 13,000 polygons representing 166,000 acres of sagebrush vegetation on public lands in northwestern South Dakota. The final product was a GIS layer of sagebrush polygons for use by land mangers of GFP and BLM.

This project was completed in 2008.

Greater sage-grouse photo by Doug Backlund

45. Population estimates, habitat relationships, and movement patterns of turtles in southeastern South Dakota

This study will help estimate populations and determine habitat needs and movement patterns of two rare turtle species, the false map turtle and the smooth softshell. The study area includes portions of the James and Missouri rivers in southeastern South Dakota. Radio telemetry will help researchers learn about movement patterns and hibernacula. Researchers are also surveying snapping turtle populations in the James River. Dr. Dave Swanson and PhD candidate Aaron Gregor of USD are conducting this study, which concludes in 2012.

Primary SDGFP contact: Silka Kempema

46. Testing the ecosystem diversity approach of South Dakota's Wildlife Action Plan

Earlier in this document is a description of the South Dakota Comprehensive Wildlife Conservation Plan, now known as the South Dakota Wildlife Action Plan. The plan is a strategic planning document, and the next step is to test the approach on the ground in South Dakota. This project demonstrated a prototype process to focus the scope of the Wildlife Action Plan to a local-level planning area. The selected area was a portion of the Missouri Coteau in northcentral South Dakota. The Missouri Coteau is part of the prairie pothole region, commonly called North America's "duck factory." In addition to abundant wetlands, this area contains many intact acres of native grassland.

This project's purpose was to produce a better understanding of the region's plant composition and ecosystem health to help interested entities more effectively meet wetland and grassland conservation goals. The project revealed that many terrestrial ecosystems in this area are missing or severely degraded due to land-use conversions and invasion by introduced species. Cooperation between public and private entities is necessary to help meet restoration objectives of native ecosystems in the Missouri Coteau, in partnership with agricultural producers. This project was conducted by Ecosystem Management Research Institute, with assistance from government and private cooperators. The project concluded in 2009.

47. Avian monitoring in the Black Hills

For the past 5 years, the Rocky Mountain Bird Observatory and Black Hills National Forest have cooperatively monitored birds in ten habitat types. Target species were identified within each habitat type to assist the Forest Service in assessing bird responses to management activities. Because of new monitoring activities, Black Hills National Forest was forced to reduce their commitment to avian monitoring in two habitat types - aspen and shrublands. This project provided State Wildlife Grants and state funding to allow the Rocky Mountain Bird Observatory to continue collecting information in these two habitat types. This project concluded in 2010.

Missouri Coteau region in North and South Dakota

48. An aquatic invasive species risk assessment for South Dakota

Aquatic invasive species have taken a tremendous toll on native species with direct impacts through predation and competition and by indirect effects of habitat alteration. Many people are familiar with the ecological and economic impacts of zebra mussels to native mussels and to infrastructure, such as water intake structures. South Dakota has begun to experience aquatic nuisance species (ANS) impacts, and SDGFP recently completed a state ANS management plan. An important component is a risk assessment. Objectives of the assessment were to identify ANS risks to South Dakota, compile information on ANS biology, vectors and pathways and to conduct a qualitative expert ranking of ANS threats. The risk assessment identified 61 ANS with potential to impact South Dakota. Fourteen of these were identified as primary sources of concern.

This project was conducted by Dr. Katie Bertrand of South Dakota State University and concluded in 2008.

49. An evaluation of habitat use and requirements for grassland bird species of greatest conservation need in central and western South Dakota

As already mentioned, grassland birds have some of the highest rates of decline of any bird groups. This research project focused on bird species of greatest of conservation need as identified in South Dakota's Wildlife Action Plan within the northcentral part of the state. Three questions were examined: What are the habitats requirements of grassland birds in this area? How are these birds influenced by grazing intensity and exotic plant species? What are the local habitat (patch size) and landscape-level needs of grassland birds in this region? Grassland species of interest included LeConte's sparrow, Baird's sparrow, Sprague's pipit, chestnut-collared longspur, lark bunting, savannah sparrow, grasshopper sparrow, dickcissel, bobolink, and western meadowlark.

Increased coverage of grasslands by exotic species negatively impacted chestnut-collared longspur, western meadowlark, grasshopper sparrow and lark bunting and positively affected bobolink. Management recommendations emphasized the importance of preserving and restoring grassland habitat patches of at least 250 acres with minimal amounts of exotic species, little or no woody edge and close proximity of grassland areas to each other.

This study was conducted by graduate student Mitch Greer under the guidance of Dr. Kristel Bakker of Dakota State University and Dr. Charles Dieter of South Dakota State University.

The study concluded in 2009.

50. Estimating conversion of native grassland to cropland in South Dakota: Loss of habitat for grassland-nesting birds

Major reasons for the decline of grassland bird species are conversion of native prairie to cropland and fragmentation of remaining grasslands into smaller pieces. This project focused on the portion of the Missouri Coteau region found in South Dakota, a critical area for production of wetland and grassland species despite loss and conversion of native habitats for other uses. This area is also the focus of conservation efforts by state, federal and private entities. Project objectives included estimating recent conversion rates of native grassland to cropland, determining the probability of conversion of grassland to cropland, developing models to predict the cost of protecting native grassland, and developing decision tools to help wildlife managers prioritize South Dakota grasslands for protection. Dr. Scott Stephens of Ducks Unlimited was the project leader.

This study concluded in 2007.

Sprague's pipit photo by Doug Backlund

51. Understanding the relationship between prairie dog ecology and black-footed ferret resource selection

Photo of black-footed ferret from USFWS Digital Library System

South Dakota hosts the most successful black-footed ferret reintroduction project in North America. A self-sustaining population inhabits part of the Conata Basin in southwestern South Dakota, depending on a large, dense population of black-tailed prairie dogs. This site's tremendous success story has not been repeated elsewhere, and researchers hope to learn lessons from the Conata Basin that might translate to other areas. This study focused on how ferrets compete for and select prey and other resources within prairie dog colonies and to more specifically measure how prairie dogs are distributed within colonies.

The project was conducted by Master of Science candidate David Eads under the direction of Dr. Joshua Millspaugh and David Jachowski of the University of Missouri-Columbia. The study affirmed ferret preference for areas of abundant, active prairie dog burrows for both prey and refuge.

This study concluded in 2009.

52. Assessment, monitoring and protection of bat habitats in western South Dakota

Photo of gated mine by Joel Tigner

This project continued survey and habitat protection work to benefit bats in western South Dakota, particularly in the Black Hills. Sites that have been protected through installation of bat-friendly, vandal-resistant bat gates were surveyed to monitor bat use and to detect vandalism. More than 250 abandoned mines were evaluated during this project. Sites needing protection were identified and prioritized and the best sites selected for bat gate installation. This project targeted abandoned mines and natural caves on private lands. Bat gates protect these mammals and alleviate landowner concerns about the safety of these sites.

This project was conducted by bat biologist Joel Tigner and concluded in 2010.

53. What factors affect territoriality and productivity of black-footed ferrets?

Despite some recent challenges, southwestern South Dakota hosts one of the most successful black-footed ferret reintroduction sites in the world. This study takes a closer look at ferrets living on certain prairie dog colonies in the Conata Basin. The research examined how ferrets use space and resources to partition themselves into territories. Researchers Shaun Grassel and Janet Rachlow of the University of Idaho also studied how ferrets and badgers partition space and other resources. The results will improve predictions about the number of ferrets that can be supported by various prairie dog age structures and colony sizes and configurations.

Fieldwork was completed in 2009. Analyses and final reports are in preparation.

54. Importance of mountain pine beetle infestations and fire as Black-backed Woodpecker habitat in the Black Hills, South Dakota

The black-backed woodpecker is a permanent Black Hills resident that reacts to disturbances to its forest habitats. Birds inhabit recently burned areas and rely on an associated food source, mountain pine beetles. This study is examining the relative importance of fire and mountain pine beetle infestations to black-backed woodpeckers. In particular, researchers will estimate seasonal home ranges and determine how birds are spending time and foraging in recently burned and pine beetle-inhabited areas.

This project is being conducted by PhD student Christopher Rota under the guidance of Dr. Mark Rumble, U.S. Forest Service and Dr. Joshua Millspaugh, University of Missouri.

The project will conclude in 2011. Primary SDGFP contact: Eileen Dowd Stukel

55. Nesting success of tree-nesting waterbirds in colonies on selected wetlands in northeast South Dakota

Earlier in this document is a description of a statewide effort to identify and describe colonial waterbird colonies in South Dakota. This study focused on a particular subset of colonial nesting waterbirds, tree-nesting species such as herons, night-herons, and egrets. Specific objectives were to determine nesting success and habitat requirements in certain nesting colonies in northeastern South Dakota. SDSDU graduate student Nathan Baker monitored more than 1,000 nests in 2008 and 2009, documenting nesting success for black-crowned night-heron, great blue heron, cattle egret, great egret, snowy egret, and double-crested cormorant. Nest failure was most commonly due to nest abandonment. Baker found island colonies to be most common site for the black-crowned night-heron and cattle, great and snowy egrets. He found relatively low reproductive success for black-crowned night-heron and great blue heron and relatively high reproductive success for double-crested cormorants in the study area.

This project concluded in 2010.

56. South Dakota Breeding Bird Atlas 2

A breeding bird atlas is an attempt to document breeding status of birds in a particular location. South Dakota's first atlas was led by volunteer Richard Peterson and the South Dakota Ornithologists' Union. It involved six years of data collection, with the results published in 1995. Repeating the atlas will allow a second look at species distributions, with an emphasis on detecting underreported groups such as rare species, owls and secretive marshbirds.

The project coordinator is Nancy Drilling of the Rocky Mountain Bird Observatory. Participation by knowledgeable volunteer and paid birders will be critical to producing a credible final product. Field work for this ambitious project will conclude in 2012.

To learn more about this project, visit:
http://www.rmbo.org/sdbba2/

Primary SDGFP contact: Eileen Dowd Stukel

57. Conservation status of the mountain sucker in South Dakota

The mountain sucker inhabits cold, clear mountain streams, such as those found in the Black Hills. This research is focused on determining current distribution, comparing it to historical distribution and determining factors that influence population status. Results will help land and water managers in the Black Hills avoid negative impacts to this species and others with similar habitat needs.

This research is led by Dr. Katie Bertrand, SDSU, with graduate student Luke Schultz.

This project will conclude in 2011.

Primary SDGFP contact: Ruth Howell

58. Evaluation of timber harvest on nongame bird abundance and diversity in Custer State Park, South Dakota

Timber harvest and management of mountain pine beetle outbreaks are common forest management tools in the Black Hills. These practices can affect the status of several bird species that are designated as species of greatest conservation need in South Dakota's Wildlife Action Plan. This research project is examining nongame bird abundance and diversity before and after certain timber sales in Custer State Park. Results will help land managers better understand impacts of these practices. Of particular interest are impacts to the northern goshawk; Lewis's, black-backed and American three-toed woodpeckers; and the white-winged junco.

This research is led by Dr. Chad Lehman, SDGFP, in cooperation with Dr. Kent Jensen, SDSU and Dr. Mark Rumble, U.S. Forest Service and graduate student Jessica Panning.

This project will conclude in 2013.

Primary SDGFP contact: Eileen Dowd Stukel

59. Prevalence of an emerging disease in South Dakota amphibian populations

Amphibian populations around the world have experienced dramatic population declines. A new threat called chytrid fungus (*Batrachochytrium dendrobatidis*) has caused great concern because of its rapid spread and detrimental impacts to amphibians. This project was designed to survey for the chytrid fungus in South Dakota, to establish an Amphibian Disease Testing Center to help evaluate disease outbreaks, and to provide information on this disease to the public and wildlife managers. With assistance from several cooperators, amphibians were sampled at varying levels throughout South Dakota, with chytrid fungus found in every area sampled, although few individuals were typically carrying an infection. Researchers speculated that the widespread distribution could indicate that chytrid fungus moved through the state some time ago.

This research was conducted by Dr. Jacob Kerby, University of South Dakota and graduate student Jennifer Brown.

This project concluded in 2011.

northern leopard frog

60. Classification and mapping of riparian vegetation along the Big Sioux River

The Big Sioux River provides an important forested corridor for wildlife and recreational and aesthetic benefits. But its location in the most densely population portion of South Dakota may expose this ecosystem to increased threats. This project is designed to map the riparian vegetation along the Big Sioux River from Watertown, SD to Sioux City, IA, to determine plant species composition within representative stands of vegetation types, and to quantify historic changes in riparian vegetation, adjacent land cover, and channel dynamics within a portion of the Big Sioux River in Brookings County.

This study is led by Dr. Mark Dixon and graduate student Matt Ley, University of South Dakota, in collaboration with the South Dakota Geological Survey, Missouri River Institute and South Dakota State University.

The project began in August 2009 and will end in August 2012.

Primary SDGFP contact: Dave Ode

61. Burrowing owl distribution in western South Dakota

South Dakota has recently gathered detailed information on the locations and sizes of black-tailed prairie dog colonies as part of a national effort to monitor this keystone species. The burrowing owl depends on prairie dog colonies for nest sites. This study will examine how burrowing owls are distributed at prairie dog colonies in western South Dakota and will try to determine the characteristics that favor burrowing owl use of prairie dog colonies at colony and landscape scales.

This project is led by Dr. Kristel Bakker, Dakota State University and Dr. Charles Dieter, South Dakota State University, with graduate student Jason Thiele. The study began in July 2009 and will conclude in June 2012.

Primary SDGFP contact: Silka Kempema

62. A biodiversity inventory of native bees in the Black Hills Ecoregion

Despite their importance as pollinators of native plants, little is known about South Dakota's native bee species. The Black Hills' diverse habitats are expected to host a variety of native bees. This project involves sampling Black Hills habitats to determine which native bee species inhabit forest, meadow and shrub-steppe habitats in the Hills, to determine host flowers and bee visitation patterns and to relate findings to historical and current land use.

This study is led by Dr. Paul Johnson, Department of Biology, South Dakota State University, with PhD student David Drons.

The project began in July 2009 and will end in December 2012.

Primary SDGFP contact: Silka Kempema

63. Distribution and lek locations of greater prairie-chickens and sharp-tailed grouse outside of their traditional range in South Dakota

South Dakota's prairie grouse are important game birds in the state, but their status depends on the quality and quantity of grasslands. As Conservation Reserve Program grassland acreage has changed, so has the distribution of these two species. This project's purpose is to locate and survey leks located in new areas, outside the traditional, primary range in the state. Based on survey results, investigators will also use GIS modeling to try to identify potential prairie grouse habitat.

This study is led by Dr. Kent Jensen and Dr. Charles Dieter, South Dakota State University, with graduate student Mandy Orth.

Primary SDGFP contact: Silka Kempema

Greater Prairie-Chicken hen
from USFWS Digital Library System

64. Glacial relict fishes in spring fed headwater streams of South Dakota's Sandhills region

An important aspect of State Wildlife Grants funding has been the ability to study habitats and resources that have not been examined thoroughly in the past. Several fish species considered rare in South Dakota occur in the unique ecosystems of the Sandhills in the southcentral part of the state. These species represent glacial relicts, having survived glacial periods while other species became extinct. In this study, lakes and streams in the Sandhills region are being sampled to learn more about four species of dace (northern redbelly, pearl, finescale and longnose), the blacknose shiner and the plains topminnow.

This study is led by Dr. Katie Bertrand, South Dakota State University, with graduate student Eli Felts. The project began in July 2010 and concludes in June 2013.

Primary SDGFP contact: Ruth Howell

66. Faunal survey of the delta habitat of Upper Lewis and Clark Lake

Deltas are formed of sediment deposits at river mouths. These habitats may have unique and diverse plant and animal communities. Sedimentation of Missouri River reservoirs is a topic of much discussion, with many potential engineering solutions considered. Information on the importance of the delta area is critical to understanding potential impacts of sediment removal. This project's study area runs roughly from the mouth of the Niobrara River to 5 river miles east of Springfield, SD. Aside from a few fish surveys, the delta of Upper Lewis and Clark Lake has not been examined to determine its use by marshbirds, amphibians, reptiles or freshwater invertebrates.

Drs. Jake Kerby and Dave Swanson, USD, head a team to survey these wildlife species and determine the potential for trematode infection in amphibian, snail and bird hosts in the area. This project began in May 2010 and will conclude in June 2012. Primary SDGFP contact: Dave Ode

65. Topeka shiner monitoring in eastern South Dakota (round two)

Following listing of the Topeka shiner as a federal endangered species, SDGFP led a state effort to develop a state management plan for this species. One of the Plan's commitments is to periodically monitor Topeka shiner populations at representative sites in eastern South Dakota. This project is the second series of surveys, in which habitat and biological data are collected. Thirty-three sample sites will be visited in a three-year period.

This project began in July 2010 and end in September 2012.

Primary SDGFP contact: Ruth Howell

67. Status of the Bear Lodge Meadow Jumping Mouse (*Zapus hudsonius campestris*)

This subspecies occurs in the Black Hills of South Dakota and in adjacent areas of northeastern Wyoming and southeastern Montana. Three other subspecies of the meadow jumping mouse occur elsewhere. This survey is designed to determine the current distribution, abundance and habitat preferences of the Bear Lodge meadow jumping mouse in the Black Hills of South Dakota. Distribution will be compared with historical records. The project is being conducted by Dr. Tim Mullican of Dakota Wesleyan University.

This project began in June 2010 and will end in August 2012.

Primary SDGFP contact: Silka Kempema

68. Distribution, abundance, and seasonal habitat use patterns in ornate box turtles in South Dakota

This species is thought to reach its most northerly distribution in southcentral South Dakota. Aside from occasional sightings and specimens, little is known about the ornate box turtle's geographic range in the state or its habitat preferences. This study is addressing those needs and examining movements, home range sizes, and activity periods and estimate population size. The study is being conducted by Alessandra Higa and Dr. Hugh Quinn of Oglala Lakota College. In addition to providing information important for the ornate box turtle's future security in the state, the research is providing valuable scientific and ecological training for students at the college.

This project began in May 2010 and will conclude in May 2012.

Primary SDGFP contact: Eileen Dowd Stukel

69. Survey and mapping of Black Hills montane grasslands

An important aspect of wildlife habitat monitoring is the opportunity to repeat surveys over time. Montane grasslands are found in the higher elevations of the Black Hills, and this habitat type has decreased with settlement of this area. Plant ecologist Hollis Marriott is working with NatureServe scientists to revisit areas sampled a decade ago. This grassland type potentially provides important habitat for several rare animal species and game species. Results of this evaluation can assist land managers, such as Black Hills National Forest, in future planning to sustain this habitat type. Project products will include a GIS layer for this habitat type, a set of photos of survey sites from relocatable points, and a field key and characterization of this vegetation type.

This project began in July 2010 and will conclude in December 2012.

Primary SDGFP contact: Dave Ode

Image source:
Bandas, S.J., and K.F. Higgins. 2004. Field Guide to South Dakota Turtles. SDCES EC 919. Brookings: South Dakota State University.

70. Evaluation of artificial bat roost selection and occupancy in South Dakota ecoregions

Wildlife Action Plans focus much attention on rare species, but the full intent of the planning effort is to assure that all species are sustained. Many of the more common bat species inhabit artificial structures, such as homes, schools, and outbuildings, particularly when natural cavity roosts are limited in an area. When this habit conflicts with other uses and bats are excluded from a structure, homeowners are often urged to place "bat houses" to attract these highly beneficial mammals. Bats need a specific microclimate, particularly if sites are used as maternity roosts or hibernation sites. This project is evaluating several commonly-used bat house designs and a culvert design to determine which is most likely to be used by bats in various parts of South Dakota. Results will have scientific value but also a practical use in helping to advise which artificial structures are most likely to be successful in attracting bats.

Graduate student Sarah Lewis and advisor Dr. Scott Pedersen of SDSU are working with bat biologist Joel Tigner. This project began in September 2010 and will conclude in May 2013.

Primary SDGFP contact: Silka Kempema

71. Mapping and characterization of calcareous fens in eastern South Dakota

For people unfamiliar with calcareous fens, this unique wetland type can be roughly compared to an Irish peat bog. Fens are small, localized wetlands that need specific environmental conditions to form and thrive. Fens support specific plant species, and several rare butterflies depend on wet sedge or wet prairie zones around wetlands. Calcareous fens are threatened by land conversion, drainage, grazing, and other activities that influence groundwater chemistry and discharge. This study will delineate and characterize fens in eastern South Dakota and produce a GIS database that includes fen locations, type, and condition. This study will assess the specific habitat goal for "slope systems" as described in South Dakota's Wildlife Action Plan.

Graduate student Elizabeth Hill is working with plant community ecologists Dr. Mark Dixon from USD and Dr. Gary Larson from SDSU. This project began in September 2010 and will conclude in August 2013.

Primary SDGFP contact: Dave Ode

72. Revision of South Dakota comprehensive wildlife plan

The background for the original plan is described for project #19 earlier in this document. Wildlife Action Plans must be revised at least every 10 years. SDGFP has chosen to revise its plan sooner to improve its usefulness to partners, to make use of new biological information, and to consider urgent threats to make the plan more meaningful. The same 8 requirements must be fulfilled with the plan revision. The requirements are:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's wildlife;
2. Descriptions of extent and condition of habitats and community types essential to conservation of species identified in (1);
3. Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;
4. Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions;
5. Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;
6. Descriptions of procedures to review the plan at intervals not to exceed ten years;
7. Plans for coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats.
8. Broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the species in greatest need of conservation.

SDGFP has begun its technical approach and will use the agency website to seek public and agency input on plan priorities, species of greatest conservation need, and other aspects to make the plan a statewide planning framework for all fish and wildlife species.

This project began in January 2011 and will conclude in December 2012.

Primary SDGFP contact: Eileen Dowd Stukel

73. Reintroduction of peregrine falcon in South Dakota

South Dakota peregrine falcon release site coordinator, Janie Fink, with one of the first birds to arrive at the Rapid City release site during the summer of 2011.

The peregrine falcon once nested in western South Dakota. No nests have been documented in recent history despite two recent small-scale reintroduction projects. This species is a state endangered species, and SDGFP hopes to restore it as a breeding bird with this effort. Peregrine chicks of the subspecies that occupies the western U.S. (*Falco peregrinus anatum*) are being purchased from falcon breeders and placed atop the Assurant Building in downtown Rapid City. Peregrines are traditionally cliff breeders, but they have adapted well to urban settings. The first group of 20 chicks were acclimated to the release site and released during the summer of 2011. Eighteen of the birds successfully fledged. The project will continue for at least two more years, both to reintroduce additional young birds and to document returns of reintroduced birds, which are banded with a numbered band on one leg and a color-coded red band on the other leg. This project has generated tremendous community support in the Black Hills under the leadership of hack site coordinator Janie Fink of Birds of Prey Northwest.

This project began in September 2010 and will conclude in September 2013.

Primary SDGFP contact: Eileen Dowd Stukel

74. Preliminary investigation into migratory movements of bats in South Dakota

Bat conservation often focuses on identifying and protecting critical maternity roosts and traditional hibernation sites. Some bat species migrate seasonally, just as many bird species do, yet little is known about bat migration needs. This study aims to begin discovering what sites provide migration habitat for bats and determine when peak migratory activity occurs in South Dakota. Acoustic bat activity detectors were placed at 16 monitoring stations across the state to potentially measure increased activity during the migration period. These detectors are designed to operate as self-contained, weatherproof units, allowing researchers to periodically retrieve and download data.

Bat biologist Joel Tigner and SDGFP wildlife biologist Silka Kempema are conducting this study, with assistance from monitoring station hosts on private and public lands.

This project began in January 2011 and will conclude in June 2013.

Primary SDGFP contact: Silka Kempema

75. Classification and mapping of riparian forest along the White River in South Dakota

The drastic conversion of the Missouri River into a series of large reservoirs created new recreational opportunities, but large blocks of cottonwood forests were lost along with the natural flooding processes to create new riparian forests. Some of the largest remaining regenerating cottonwood forests in South Dakota are found along the White River. This project involves mapping vegetation along the White River's riparian corridor. Certain study reaches will be quantified in more detail, particularly in the delta area where the White River flows into the Missouri River. Analysis of historical aerial photography will allow researchers to quantify historical changes in riparian vegetation, recruitment, and channel characteristics.

This project is conducted by plant ecologists Dr. Mark Dixon at USD, Dr. W. Carter Johnson at SDSU, and Tim Cowman, director of the Missouri River Institute at USD. The project began in August 2011 and will conclude in June 2014. Primary SDGFP contact: Dave Ode

76. Past and current vegetation conditions of core sagebrush habitat and leks of greater sage-grouse in South Dakota

South Dakota is located on the eastern edge of the range of the greater sage-grouse, a federal candidate for listing under the Endangered Species Act. Although not likely to be a major contributor to the long-term status of this species, South Dakota's sage habitats provide important habitat for several rare species besides the greater sage-grouse, including the sage thrasher, sagebrush vole, and short-horned lizard. This project makes use of vegetation data from 1992-1993 collected by SDGFP biologist Art Carter at known greater sage-grouse leks. These historical sites will be revisited during the study to determine changes in the 20-year period. New vegetation data will be compared to results from other studies. The information will help design sage habitat restoration plans at specific sites and at a landscape scale.

The project is being conducted by SDGFP wildlife biologist Shelly Deisch and plant ecologist Daryl Mergen. The project began in October 2011 and will conclude in April 2013.

Primary SDGFP contact: Dave Ode

77. Colonial and semi-colonial waterbird monitoring

A previous effort (see description for project #26) surveyed colonial and semi-colonial waterbird colonies throughout South Dakota. These sites are often traditional, but they are also dynamic due to changing landscape and water conditions in the Northern Great Plains. Northeastern South Dakota, in particular, has experienced historically high water levels in recent years, which has undoubtedly caused shifts in waterbird colony locations and species composition. This survey effort will involve revisiting and resurveying the most important colonial waterbird sites documented by the Rocky Mountain Bird Observatory during the 2005-2007 field work. This effort will also include searching for new colonies to characterize habitat conditions and colonial and semi-colonial nesting bird use.

This project will be conducted by the Rocky Mountain Bird Observatory, beginning in January 2012 and concluding in December 2012.

Primary SDGFP contact: Eileen Dowd Stukel

78. Status and distribution of Franklin's ground squirrels and Richardson's ground squirrels in eastern South Dakota

Basic information is needed for these two species of native grassland-dependent ground squirrels. General study objectives will be to identify and characterize colony sites, describe the current range in eastern South Dakota, and estimate relative abundance. Study results will help identify key habitat components for these species. This study is led by Dr. Charles Dieter of SDSU and Dr. Tim Mullican of Dakota Wesleyan University, with graduate student Tait Ronningen.

The study begins in July 2012 and concludes in June 2015.

Primary SDGFP contact: Eileen Dowd Stukel

79. Black-footed ferret habitat enhancement in Conata Basin, South Dakota

The most successful black-footed ferret reintroduction site in North America is in the Conata Basin in southwestern South Dakota. Black-footed ferrets require prairie dog colonies to provide food, shelter, and places to rear young. The Nature Conservancy has purchased several large ranches in the area to contribute to the long-term sustainability of the black-footed ferret population. This project will assist TNC in enhancing 600 acres of prairie dog habitat on its lands through grazing management to benefit black-footed ferrets. TNC partners will document changes in vegetation and prairie dog distribution.

This project began in October 2011 and will conclude in December 2013.

Primary SDGFP contact: Silka Kempema

80. Determination of river otter distribution and evaluation of potential sites for population expansion in South Dakota

The river otter is a state threatened species in South Dakota. Based on accidental captures by beaver trappers, road kill records, and observations of live animals, the population is increasing in the state. To better determine current status and distribution, SDGFP has partnered with Dr. Wayne Melquist, a furbearer expert with extensive river otter experience. Wayne will revisit sites previously evaluated by Alyssa Kiesow and will help the agency determine where there is expansion potential for this species. SDGFP does not delist a species from state protection without an abundance of defensible data. Results from this effort will help the agency design a management course of action for this furbearer.

This project began in October 2011 and concludes in December 2013.

Primary SDGFP contact: Silka Kempema

81. Development of a long-term grassland songbird monitoring program for South Dakota

One of the biggest challenges of wildlife management is detecting changes in populations over time. Intensive surveys are expensive and impractical, so population trends and indices are often used instead. As an example, the North American Breeding Bird Survey has been conducted for decades; it provides valuable information on long-term population trends for those species that are adequately sampled. Four grassland-dependent bird species in South Dakota have raised concern about their long-term status. They are the Sprague's pipit, lark bunting, Baird's sparrow, and chestnut-collared longspur. A challenge to using Breeding Bird Survey data for rare and potential declining species is that they may not be well sampled by this type of survey. In thsis project, bird literature will be reviewed and added to a previous literature review. Existing monitoring plans will be reviewed for their relevance to rare grassland birds, and a monitoring plan will be developed to help detect trends in rare grassland bird species populations.

This project will be completed by Dr. Kristel Bakker of Dakota State University and Silka Kempema, SDGFP. The project began in September 2011 and will conclude in June 2015.

Primary SDGFP contact: Silka Kempema

River otter image by Jim Leopold; USFWS images

82. Threats, management, and suggested harvest and collection policy of herpetofauna of South Dakota

As part of its Wildlife Action Plan revision, SDGFP wants to assure that the needs of herpetofauna (reptiles and amphibians) are evaluated. This group includes several species protected under South Dakota's state endangered species law. For many herp species, nearly unlimited take is allowed under current regulations. This project involves assessing the potential impact of such take on herp species in light of the many other threats facing them. Herpetologists Dr. Brian Smith and Dr. Hugh Quinn will compile and review current literature, recommend take allowances, identify the best management practices for herps during construction projects, and identify and describe impacts of general threats to herps in South Dakota. This review will be completed in time to include in South Dakota's Wildlife Action Plan revision.

This project began in September 2011 and will conclude in August 2012.

Primary SDGFP contact: Ruth Howell