South Dakota Forest Action Plan

Section V:

Appendices

APPENDIX A: Black Hills Wildfires

Meade, Lawrence, Fall River, Pennington, and Custer Counties

Data analysis conducted by South Dakota Wildland Fire (SDWF) for Calendar Years (CY)
2001-2016 shows 3,835 ignitions for Great Plains Center (GPC) Initial Attack area including the Black Hills Forest Fire Protection District. Of the total ignitions, 1,894 or 49% were human caused. Total acreage burned for the 15-year time period was 356,971 acres, 197,277 acres were human caused. This total acreage and the number of ignitions include acreage burned on neighboring federal agency lands. Fall River had more acreage burned in the 15-year time period than any other county. Fall River had a total of 138,335 acres burned resulting in 39% of the total acres burned in the GPC Initial Attack Zone.

Table A-1. Rate of Fire Occurrence 2001-2016 Including Acres Burned on Federal Agency Lands

	Lightning	Human	Total
Meade	236	264	500
Lawrence	538	337	875
Fall River	538	375	913
Pennington	372	764	1136
Custer	257	154	411
Total	1941	1894	3835

Table A-2. Acreage Burned 2001-2016. Including Acres Burned on Federal Agency Lands

	Lightning	Human	Total
Meade	10,979	15,311	26,290
Lawrence	27,613	42,925	70,538
Fall River	85,826	52,509	138,335
Pennington	19,306	78,367	97,673
Custer	15,970	8,165	24,135
Total	159,694	197,277	356,971

Figure A-1. Graph Showing acres burned by county by ignition cause from 2001-2016

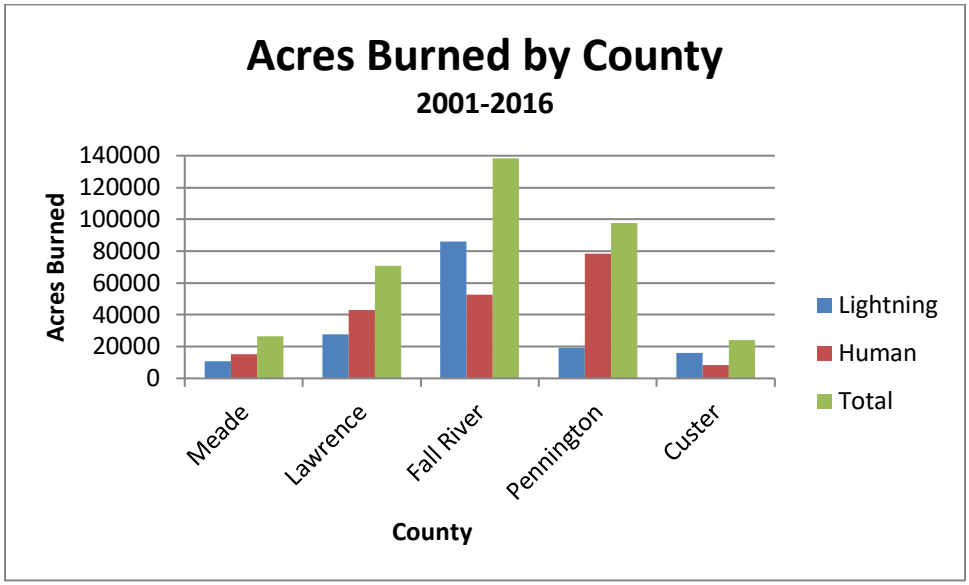


Figure A-2. Graph Showing number of fires by county by ignition cause from 2001-2016

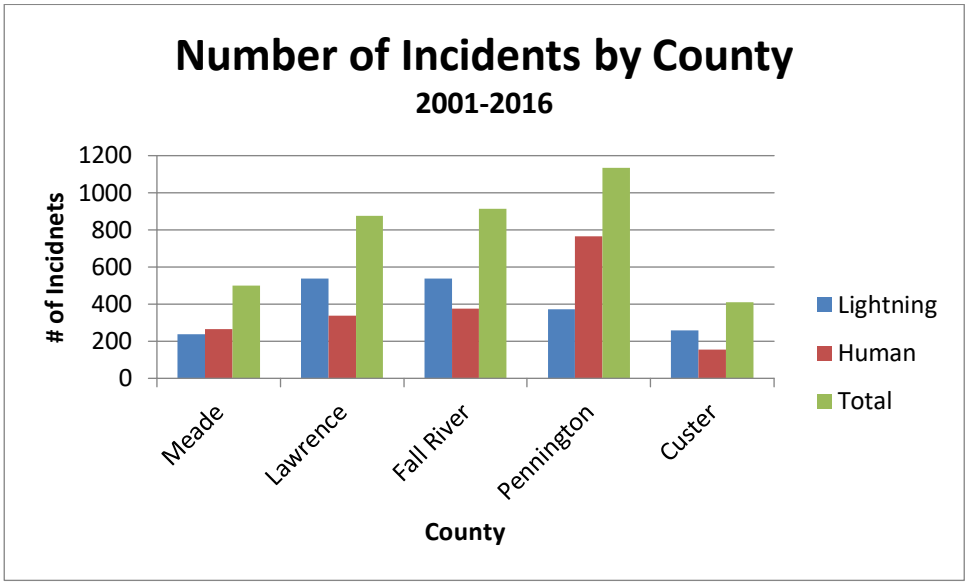
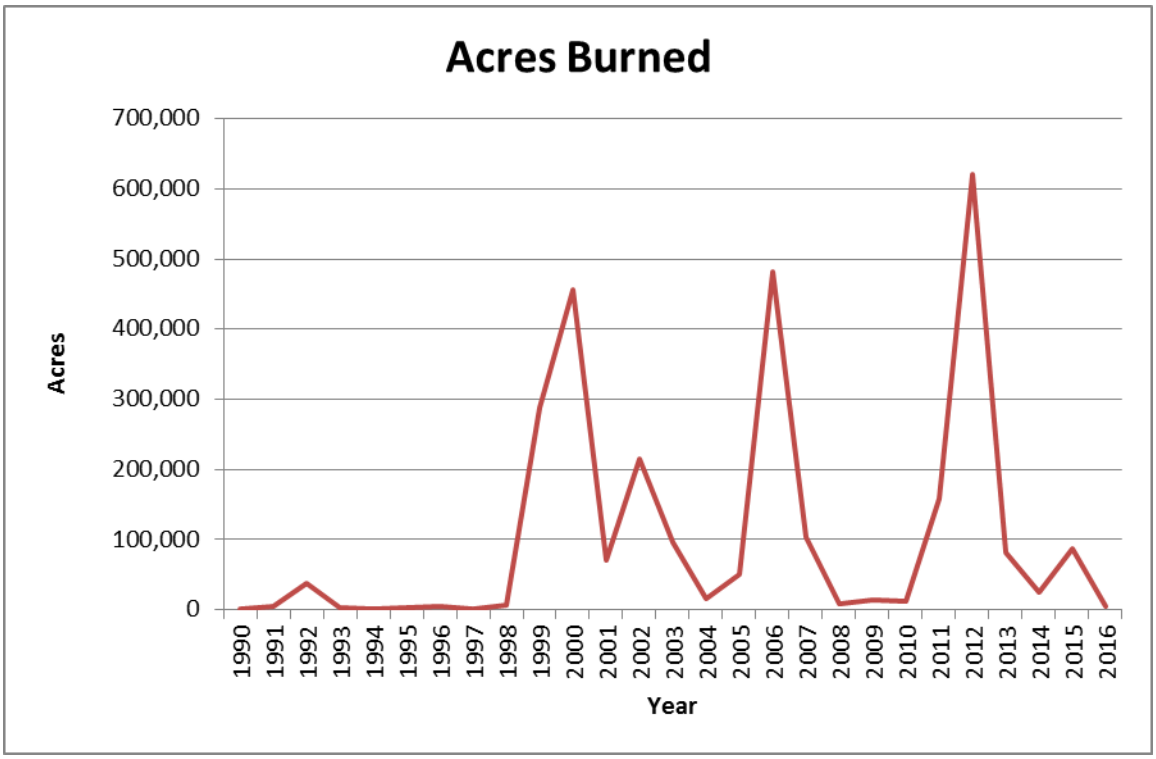


Figure A-3. Graph showing acres burned by year since 1990 in South Dakota



APPENDIX B: Forest Ownership

The table below shows the breakdown of forested acres in South Dakota by Forest Type and Ownership Class. The data is derived from USDA Forest Inventory and Analysis data using the EVALIDator tool (https://www.fia.fs.fed.us/tools-data/index.php). Numbers displayed in green have greater than 25% error and numbers in red have greater than 50% error.

	Ownership Class										
Forest type	National Forest	National Park Service	Bureau of Land Management	Other federal	State	County and Municipal	Private	Total Upland	Total Bottomland	Total Conifer	Total
White spruce	54,089	-	11,888	-	-	-	11,094			11,094	77,071
Eastern redcedar	-	-	-	-	-	-	53,923			53,923	53,923
Rocky Mountain juniper	16,718	-	4,458	-	-	-	47,030			47,030	68,207
Ponderosa pine	784,783	11,888	-	-	50,986	-	276,172			276,172	1,123,829
Nonstocked	101,039	5,944	4,539	-	6,036	-	54,159			54,159	171,717
Eastern redcedar / hardwood	-	-	-	-	4,457	-	12,631			12,631	17,088
Bur oak	-	-	-	-	-	-	88,453	88,453			88,453
Elm / ash / black locust	-	-	-	6,546	-	9,437	18,761	18,761			34,744
Mixed upland hardwoods	4,837	-	-	-	-	-	7,047	7,047			11,885
Sugarberry / hackberry / elm / green ash	-	-	-	-	5,399	-	90,317	90,317			95,716

	Ownership Class										
Forest type	National Forest	National Park Service	Bureau of Land Management	Other federal	State	County and Municipal	Private	Total Upland	Total Bottomland	Total Conifer	Total
Sugar maple / beech / yellow birch	-	-	-	-	-	-	9,037	9,037			9,037
Aspen	43,604	-	-	-	-	-	7,293	7,293			50,897
Other hardwoods	21,457	-	-	-	5,944	-	21,750	21,750			49,151
Other exotic hardwoods	-	-	-	-	-	-	34,805	34,805			34,805
Cottonwood	-	-	-	-	6,311	1,489	43,605		43,605		51,406
Cottonwood / willow	-	-	-	-	-	-	4,563		4,563		4,563
Totals	**1,026,527**	**17,832**	**20,885**	**6,546**	**79,133**	**10,926**	**780,640**	**277,463**	**48,168**	**455,009**	**1,942,492**

APPENDIX C: Community Tree Inventories & Municipality Risk Ratings

1.0 Community Tree Inventories

The Division of Resource Conservation and Forestry (RCF) has conducted community tree inventories in 68 communities that are available as CTAP reports. Each community was provided with a copy of the report at the end of the inventory to help them in bettering their community forestry efforts. The following communities have taken part in these inventories:

• Aberdeen*	• Baltic	• Beresford
• Bison	• Box Elder	• Brandon
• Brookings*	• Buffalo	• Buffalo Gap
• Burke	• Canton	• Chamberlain
• Clark	• Custer	• Deadwood
• Dell Rapids	• DeSmet	• Eagle Butte
• Elk Point	• Faith	• Fort Pierre
• Flandreau	• Freeman	• Fruitdale
• Gary	• Gettysburg	• Gregory
• Groton	• Hartford	• Hermosa
• Highmore	• Hot Springs	• Howard
• Huron*	• Ipswich	• Kadoka
• Lennox	• Martin	• Milbank
• Mission	• Mitchell*	• Miller
• Mission	• Mobridge	• Murdo
• Newell	• Parkston	• Phillip
• Pickstown	• Pierre***	• Platte
• Rapid City**	• Redfield	• Salem
• Sioux Falls*	• Sisseton	• Spearfish**
• Spencer	• Sturgis	• Timber Lake
• Vermillion	• Volga	• Wall
• Webster	• Whitewood	• Winner
• Wood	• Yankton*	•

The reports are available to the public and can be obtained by contacting RCF. Please call (605)773-3623.

Unless specified by the markings below, the listed cities had complete public tree inventories performed.

*Parks only

**Select streets only

***Pierre has an inventory for Capitol Grounds and public parks

2.0 Community Forest Priority Ranking

The Community Forest Priority Ranking map is a compilation of the five data layers listed below.

1. Incorporated municipalities (Section 2.1).

2. If the community fell in projected Developing Areas (Section 2.2).

3. A community risk rating based on the size of the municipality and the percentage of

high-risk tree species (Section 2.3).

4. A ranking of communities that are managing their community forest, developing a

management program or have no management and none planned. (Section 2.4).

5. Community certification as a Tree City USA (Section 2.5).

This dataset places communities into "high, medium, and low" priority categories.

High priority communities have the following characteristics:

• On average, the community has a high or medium percentage of ash, elm, and walnut according to the Community Risk Rating.

• The community falls within the future growth areas as illustrated on the Developing Areas map.

• The community is not a Tree City USA.

• The community does not have a community forestry program (not "Managing" or "Developing" according to Community Accomplishment Reporting System (CARS)).

Medium priority communities have the following characteristics:

• The community on average has a high or medium percentage of elm, ash and walnut according to the Community Risk Rating.

• The community either has no community forestry program or is developing one.

• The community falls within the future growth areas according to the Developing Areas

map and is a Tree City USA.

• The community is not in the future growth areas according to the Developing Areas map and is not a Tree City USA.

Low priority communities have the following characteristics:

• The community has a low percentage of elm, ash, and walnut, according to the

Community Risk Rating.

- These communities are a focal point of the Developing Areas; that is, the Developing

Areas are extending out from these communities.

• The community has an established community forest management program or is

developing one as defined by CARS.

• The community is a Tree City USA.

The raster dataset used for modeling the SAFR Priority Area map was created by assigning a 1 to high-priority communities and 0 to all other communities and "no data" values. Thereby, only high-risk communities are represented in the Priority Area map. The following data layers were used to

create the Community Forests Priority Ranking data layer. The Wildland Urban Interface (WUI) layer was added to show how fire threatened communities with WUI areas fit into this ranking.

2.1 Incorporated Municipalities

Figure C-2.1 shows all of South Dakota's incorporated municipalities. Data for this layer are extracted from the South Dakota Municipality geospatial dataset, which is derived from the U.S. Census by the South Dakota Departments of Revenue and Transportation.

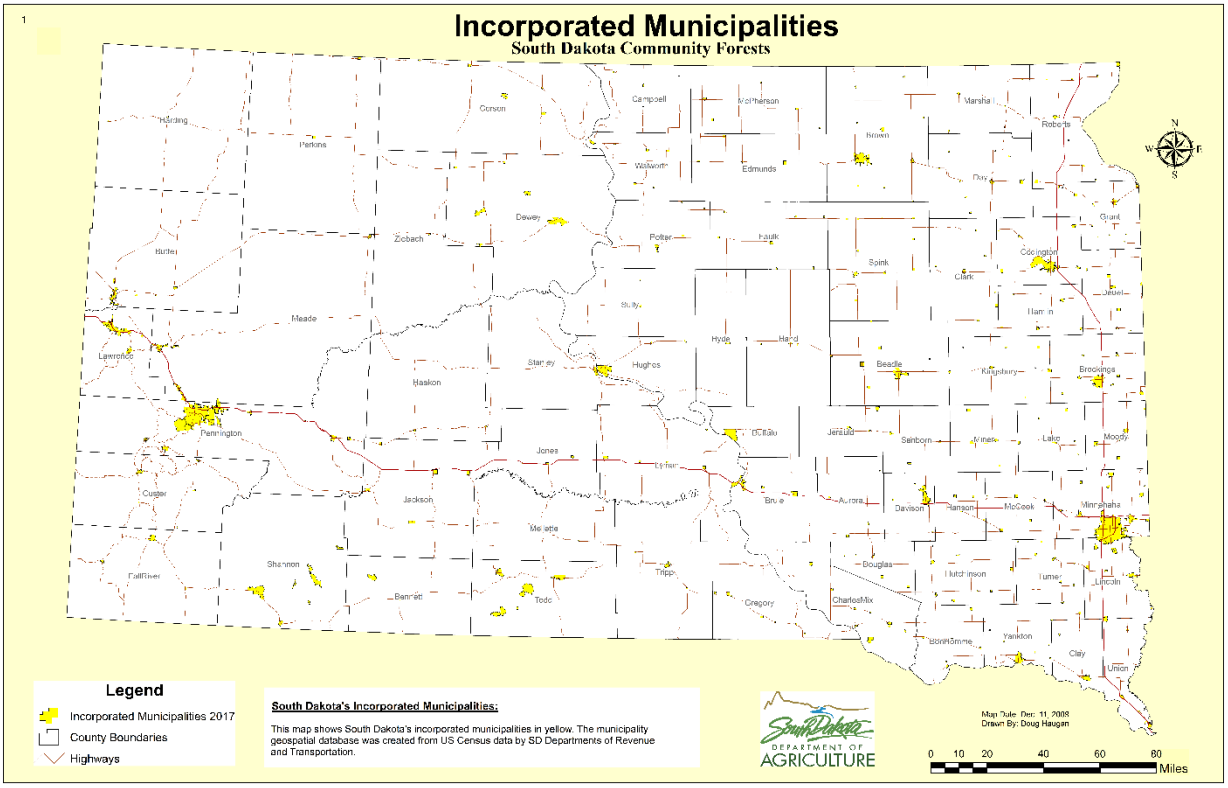


Figure C-2.1: Incorporated Municipalities

2.2 Incorporated Municipalities: Developing Areas

This map combines the Incorporated Municipalities and Developing Areas data layers. Figure C-2.2 shows all of South Dakota's incorporated municipalities in yellow. The orange areas are the projected expanded urban areas developed by USFS Spatial Analysis Project (SAP) layers for 2030. This is an important layer because it shows where the possible urban growth will be. Communities were evaluated that fell within the expanded areas and whether they were managing, developing, or doing nothing for the community forests; whether they were a Tree City USA; and what species risk designation they fell in. The communities that did not have any of these designations and fell in the "medium" and "high" species risk categories were automatically bumped up to "high" priority on the final community forests priority map.

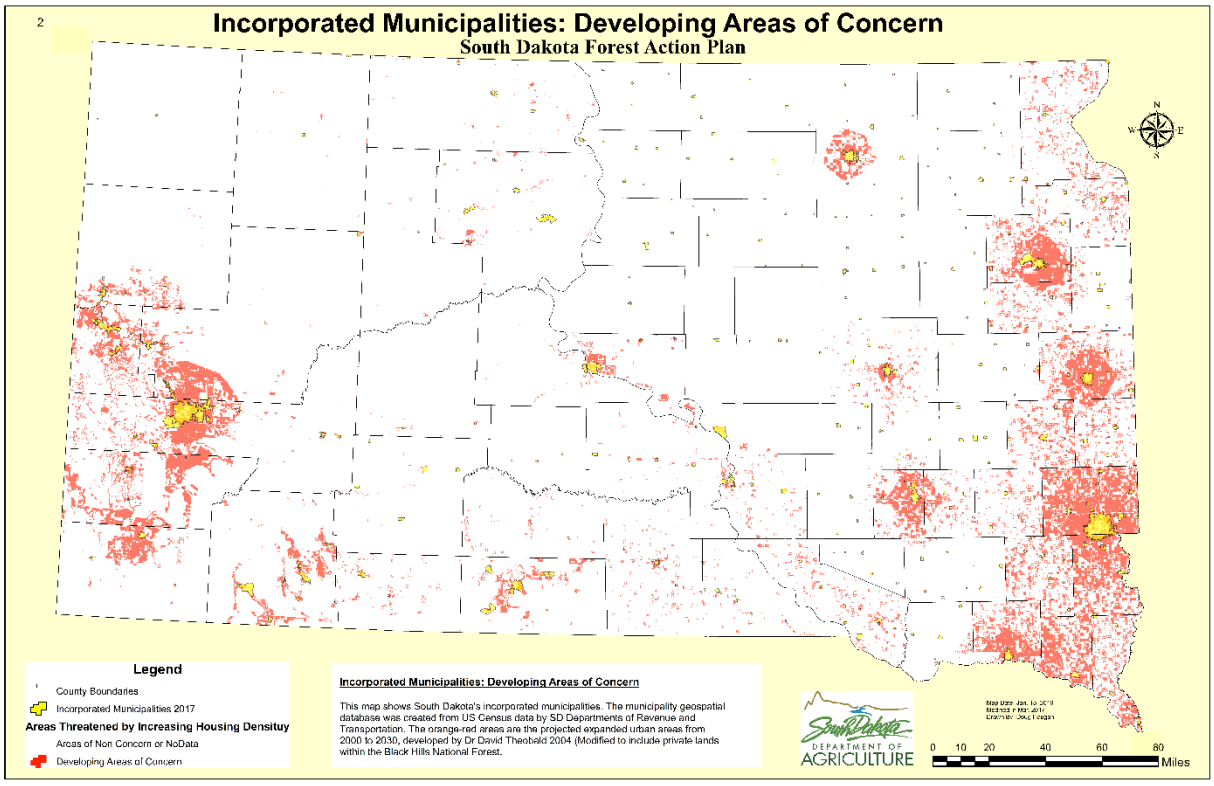


Figure C-2.2: Incorporated Municipalities and Developing Areas Map

2.3 Incorporated Municipalities: Risk Rating

Figure C-2.3 shows all of South Dakota's incorporated municipalities. The communities are categorized and separated by human population classes based on the South Dakota Municipal League classification shown in Table C-2.3. The three classes are: Class 1–5,000 and over, Class 2–5,000 to 500, and Class 3–500 and less. The data to cover all the municipality classes were expanded based on sample street tree inventories completed in 77 communities across the state.

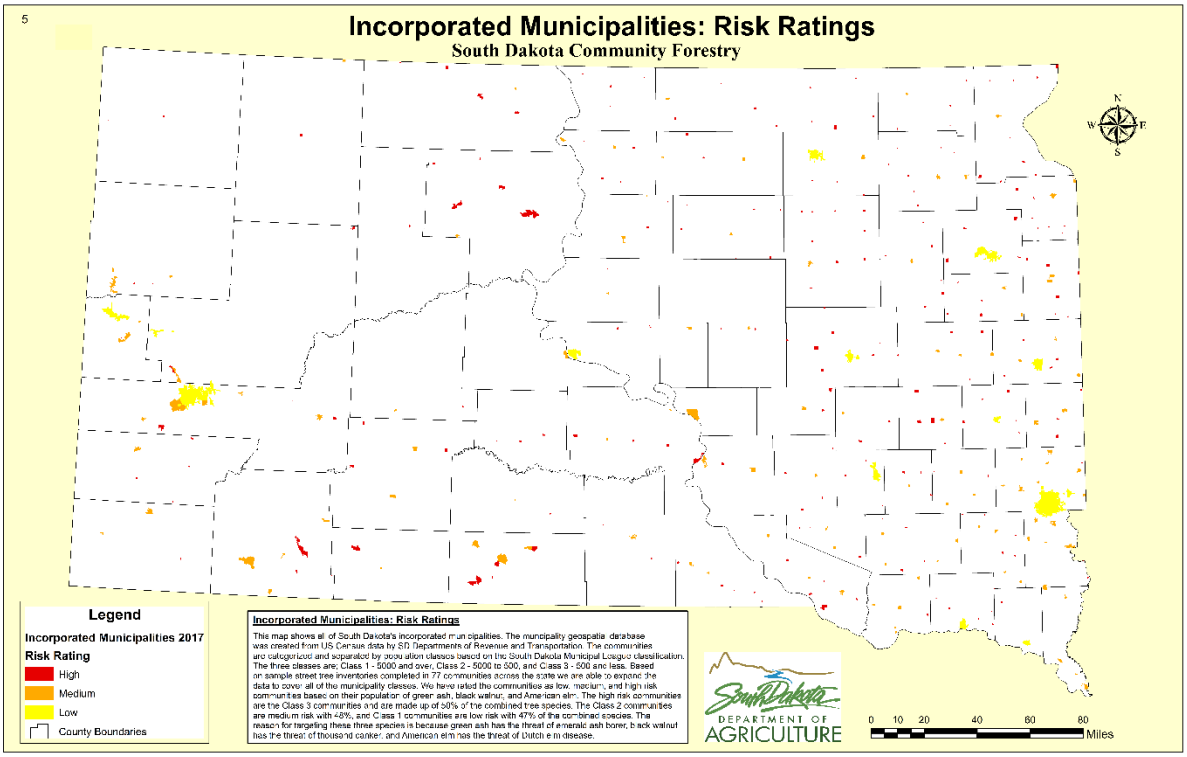


Figure C-2.3: Incorporated Municipalities Risk Ratings.

Size of Community	Percent High Risk Species	Risk Rating
Class 1	47	Low
Class 2	48	Medium
Class 3	50	High

Table C-2.3: Municipal League Classification.

Municipalities were rated as low, medium, and high risk based on their human population and their population of high-risk tree species: green ash, black walnut, and American elm.

These tree species are considered high risk because green ash is threatened by emerald ash borer, black walnut is threatened by thousand cankers disease, and American elm is threatened by Dutch elm disease. The number of high-risk trees in inventoried Class 1 municipalities was averaged to arrive at 47 percent of the trees in inventoried Class 1 municipalities as high risk species. This 47 percent was extrapolated to all Class 1 municipalities in the state. The same process was used for Class 2 and Class 3 municipalities. The result was in Class 2 municipalities, 48 percent of the trees are high-risk species and in Class 3 municipalities, 50 percent of the trees are high-risk species. The classes were ranked from lowest to highest, given the risk rating.

2.4 Incorporated Municipalities: Managing, Developing, or None

Figure C-2.4 shows all of South Dakota's incorporated municipalities. This map has separated the communities into "Managing," "Developing," or "None" categories. These categories are set by the U.S. Forest Service's CARS. Managing communities are defined as (1) having active urban and community tree and forest management plans; (2) employing or retaining through written agreement the services of professional forestry staff; (3)

adopting local/statewide ordinances or policies that focus on planting, protecting, and maintaining their urban and community trees and forests; and (4) having local advocacy/advisory organizations, such as active tree boards, commissions, or nonprofit organizations. Developing communities are defined as having between one and three of the above categories. If the municipality falls in the "None" category, they could have none or one of the above categories and the municipality did not receive any assistance from the RC&F within the past fiscal year.

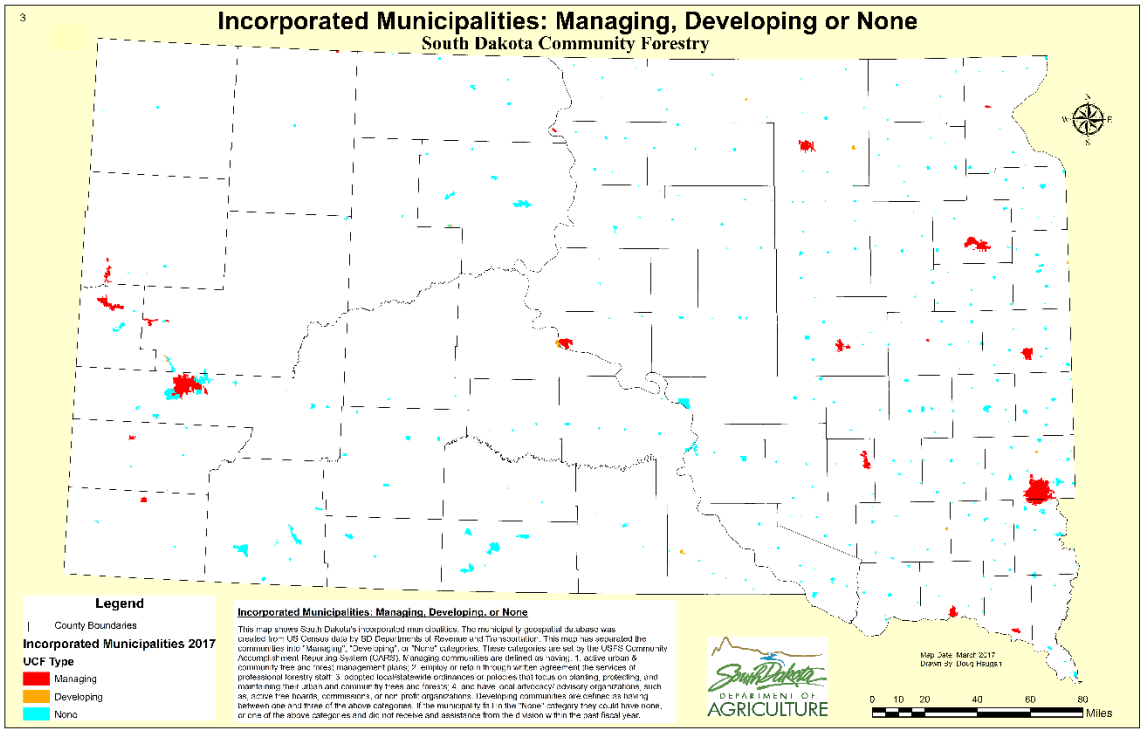


Figure C-2.4: Classification of Municipalities as Managing, Developing, or None.

On Figure B-15, the highest ranking to "None" communities was given, the second highest ranking was to "Developing," and the lowest ranking was to "Managing." The reasoning behind this is "managing" communities do not need a lot of technical assistance; developing will need some technical assistance; and "none" will need substantial of help from RC&F as they do not have the knowledge, funds, or capability of establishing or maintaining a community forestry program of their own.

2.5 Incorporated Municipalities: Tree City USA

Figure C-2.5 shows all Tree City USA communities as designated by the Arbor Day Foundation. This map shows all Tree City USA communities as designated by the Arbor Day Foundation. Tree City USA communities are ranked low priority because by being a Tree City USA, they have shown they can maintain a community forestry program and typically need little technical assistance from RC&F.

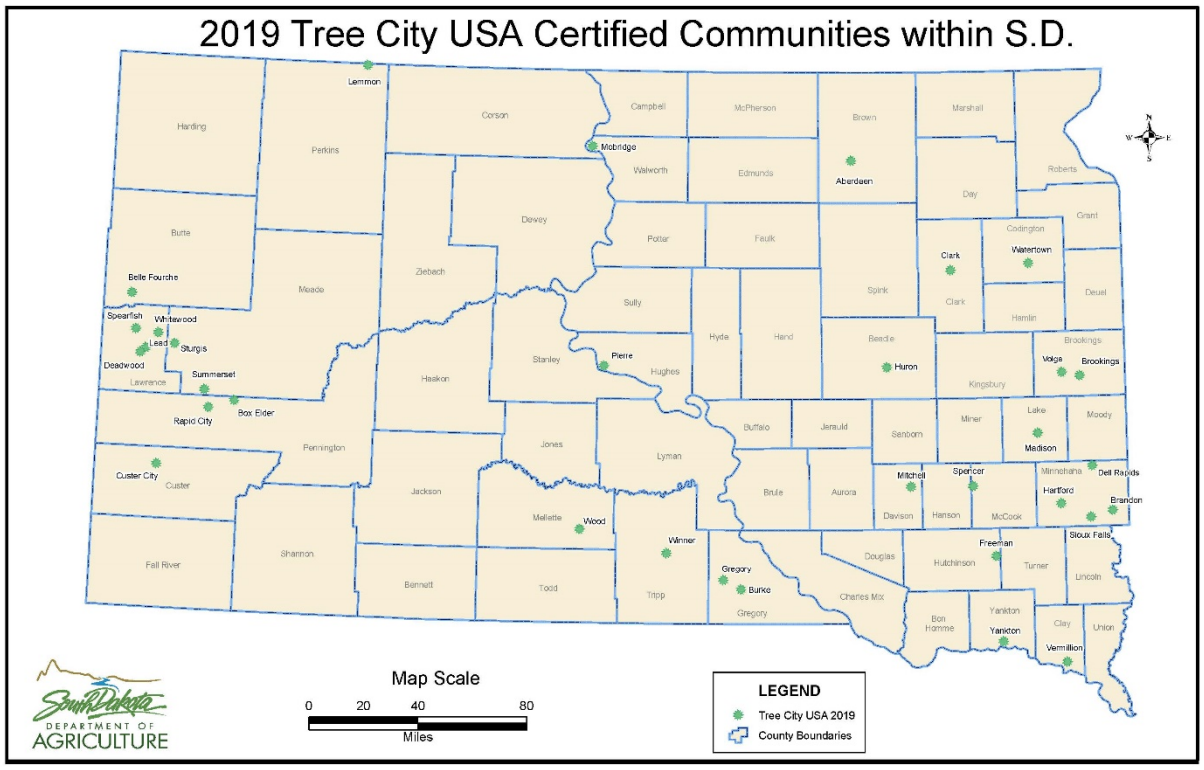


Figure C-2.5: South Dakota Tree City USA Communities.

APPENDIX D: Threats, National Priorities and Program Areas

1. Threats Identified in the Forest Resource Assessments of the South Dakota Forest Action Plan:

- Loss of trees to development
- Lack of management (forest stagnation)
- Invasive species
- Wildfire
- Extreme weather events
- Climate change
- Disengaged Public
- Inadequate inventory
- Lack of forest resiliency
- Poor water quality and quantity
- Inadequate species diversity
- Unpredictable budget
- Overgrazing
- Over-mature and dying trees in communities and windbreaks
- Fragmentation
- Lack of markets for wood products
- Poor survival and maintenance of planted trees
- Loss or degradation of wildlife habitat
- Herbicide drift
-

2. National Priorities:

- Conserve and Manage Working Forest Landscapes for Multiple Values and Uses
- Protect Forests from Threats
- Enhance Public Benefits from Trees and Forests

3. Program Areas:

- Stewardship Forestry
- Forest Health Monitoring
- Urban and Community Forestry
- Wildfire Suppression and Prevention
- Forest Inventory and Analysis
- Agroforestry
- Cooperative Forestry Assistance
- Natural Resource Conservation

APPENDIX E: Other Plans Reviewed/Incorporated for Forest Action Plan

	Forest Types Considered				
Other Plans Reviewed for South Dakota's Forest Action Plan	Coniferous	Upland HW	Bottomland HW	Shelterbelts	Urban Forests
SD Coordinated Plan for Natural Resources	X	X	X	X	
SD Emerald Ash Borer Readiness Plan		X	X	X	X
SD Forest Stewardship Plan	X	X	X	X	
SD Wildland Fire Risk Assessment	X	X	X	X	
SDDENR Nonpoint Source Program Management Plan	X		X		X
SD GFP Wildlife Action Plan	X	X	X	X	X
SD GFP Bat Management Plan	X	X	X	X	X
SD GFP Custer State Park Resource Management Plan	X	X	X		
SD GFP Elk Management Plan	X	X			
SD GFP Prairie Grouse Management Plan		X	X	X	
SD GFP Sage Grouse Management Plan		X	X	X	
SD GFP Statewide Comprehensive Outdoor Recreation Plan	X	X	X	X	
Grasslands Coalition Plan		X	X	X	
Lower Brule Sioux Tribe CWPP	X	X	X	X	
Rosebud Sioux Resource Management Plan	X	X	X	X	
USCOE Bald Eagle and Cottonwood Management			X		
USCOE Cottonwood Regeneration Along Missouri			X		
USDOI BLM South Dakota Resource Management Plan	X	X	X		
USDOI Badlands General Management Plans	X	X	X		
USDOI National Invasive Species Management Plan	X	X	X	X	X
USDOI Black-Tailed Prairie Dog Management Plan				X	
USDOI Mount Rushmore MPB Action Plan	X				
USDA FS Custer National Forest Land Resource Management Plan	X	X			
USDA FS Cooperative Forestry Strategic Plan	X	X	X	X	X
USDA FS Forest Health Protection Strategic Plan	X	X	X		
USDA FS Invasive Species Management Plan	X	X	X	X	
USDA Black Hills National Forest Land Resource Management Plan	X	X	X		
USDA FS Strategic Plan	X	X	X	X	X
USDA FS 10 Year Urban Forestry Action Plan					X
SD Community Wildfire Protection Plans	X				X
Black Hills Resilient Foresty Strategy	X				

APPENDIX F: Public Survey Results

South Dakota Forest Action Plan Survey

Resource Conservation and Forestry (RCF) conducted a survey to obtain input into the identification of statewide priority areas and the development of strategies for addressing threats and opportunities in South Dakota's forests.

Process of development and collecting input:

- Contacted several states and asked for the survey's they used to poll constituents for input to their forest action plans.
- Compiled a draft list of questions and responses by using other states questions/responses as samples to compose questions and responses specifically for South Dakota.
- Consulted with Game, Fish, and Parks survey coordinator.
- Consulted with Dr. John Ball about the survey.
- Mailed survey to 640 partners listed in the 2010 Forest Action Plan.
- A press release was sent out to inform the general public about the survey and provided a link to the survey on Survey Monkey.
- 363 mailed surveys were returned.
- 104 surveys were completed on the Survey Monkey website. Survey Monkey was used to for its ease of access and the ability to generate reports.
- The mailed survey response rate was 56.7% response rate.

The survey was completed by landowners as a single request, without follow-up to individuals who did not respond. The survey was completed by 363 people with slightly more than half residing in the Black Hills. Approximately half the respondents lived in the Black Hills region (49.3%), another 11.1 percent from the Vermillion-Big Sioux region. The Black Hills has about 20 percent of the state population and the Vermillion- Big Sioux another 25 percent. This means the survey should not be assumed to represent the entire state, proportioned for population, as it is heavily weight toward the Black Hills.

Approximately 70 percent of the state population lives in an incorporated community, but only about 30 percent of the respondents. The respondents

were also heavily weighted towards resource professionals who comprised about one-third of the respondents. This means the survey results are heavily biased toward the views and attitudes of resource professional and also rural landowners and should not be assumed to represent the entire state proportional to the population.

This high respond rate from this single geographical region and from resource professionals skews the results and limits comparisons within some regions that had very low responds rates. Numbers in bold were significantly different values.

The survey asked which region of the state was most important to them, regardless of where they resided. The Black Hills forest region was considered the most important (59.5%) and the only region in which at least one respondent from another region ranked it as most important. The Prairie was second at 9.3 percent. The Coteau and the South James-Missouri were the two regions that no respondents residing outside of these areas deemed them as most important. The Northwest region was deems most important by the lowest number of respondents (2.6%). It was also the region with the fewest resident respondents (2.6%).

1. Threats to South Dakota forestlands, 1=most important, 5=least important of the top five threats, by respondents.

	Climate	Frag.	Insects & Disease	Invasive species	Lack of active mgt.	Lack of species diversity	Land use	Loss of urban trees	Road use	Grazing	Logging	Tax	Wildfire
1	32	28	**123**	28	27	10	39	6	6	4	0	9	37
2	16	27	**74**	59	37	19	36	10	10	6	6	11	40
3	16	23	**42**	**43**	**41**	36	33	18	16	13	7	15	38
4	23	21	30	**52**	27	35	29	21	20	10	8	27	34
5	22	29	24	29	28	31	25	**36**	26	15	7	21	**35**

Insects and diseases were considered the most significant threats to South Dakota forests and were ranked as the first and second most important. At least one respondent in each of the geographical regions also listed insects and disease as the most important threat to our forests.

Insects and diseases were not considered the second most important threat by respondents in each of the geographical regions. Invasive species were considered the second most important threat by respondents from the Coteau, North Missouri, Northwest and Vermillion.

There was less consensus on the third most important threat with insects and diseases, invasive species and lack of active management all of equal importance. This same trend was common among respondents from most of the geographical regions, though land use changes was ranked highest as a third choice by the Prairie region.

Invasive species was considered fourth in importance by respondents, though respondents from the Vermillion region considered lack of species diversity as their most common fourth choice.

Wildfire was the considered the least important of the top five threats when all respondents were combined but there was no significant choice for five among each of the geographic regions. Insects and diseases, Invasive species, loss of urban trees, lack of forest management were all common selections.

2. Techniques used to manage South Dakota forests by respondents.

	Bio. cont	Grazing	Fencing	Fire	No mgt	Pesticides	Roads	Thinning	Timber	Trails
Strongly favor	**192**	104	81	**145**	4	118	77	**183**	**167**	116
Somewhat favor	147	**173**	**176**	**133**	17	**161**	**157**	139	153	**166**
Somewhat	16	60	74	58	81	53	89	27	22	55
Strongly	1	18	14	15	**240**	22	19	3	10	12

Each of the techniques can only be viewed within its own category, rather than across categories. The respondents strongly favored the use of biological controls for noxious and invasive pests, the use of thinning and harvesting timber.

The respondents somewhat favored grazing, fencing, pesticides, road construction and maintenance, and trails construction and maintenance. Fire was almost equally considered as a 'strongly favor' and 'somewhat favor' technique.

No technique was identified as 'somewhat opposed' by the majority of respondents. Only one technique, 'no management' was ranked highest as strongly oppose.

These general trends were across all geographical regions with a few minor differences. Some categories, for example, were ranked highest as 'somewhat favor' rather than strongly favor. However, the small number of respondents in some of the geographical regions prevents any meaningful comparison.

3. Potential benefits of South Dakota native forestland, 1=most important, 5=least important of the top five benefits, by respondents.

	Air	Bio diversity	Carbon seq	Cultural Spiritual	Forage livestock	Human health	Non-timber products	Recreation	Plant wildlife habitat	Endang species habitat	Water quality	Wood
1	51	22	15	2	11	21	2	36	**103**	5	58	23
2	40	26	14	5	11	20	4	49	**85**	22	55	19
3	49	27	23	7	7	24	4	48	45	29	**66**	17
4	31	34	13	12	19	25	3	37	45	31	**55**	39
5	**47**	32	15	20	20	22	9	**48**	26	26	25	38

There were very clear choices for benefits to native forestlands. Plant and wildlife habitat was considered the most important benefit by the respondents. It was also considered the second choice. The third and fourth choices in importance were water quality with air quality and recreation the fifth, or the least importance of the top five.

Similar to the results of question 2, these general trends were across geographical regions with only a few minor differences. Plant and wildlife habitat were still the first and second choices for the most important benefits. Water quality was still a third choice. However, fourth and five

choices became more diffused with biological diversity appearing as a common choice for respondents in the Coteau, the Northwest and Vermillion. However, the small number of respondents in these regions prevents any meaningful comparisons.

here were some differences if forest landowners were separated out from the other respondents. Forest landowners gave slightly less importance to forage for livestock, human health and endangered species habitat.

4. Potential benefits of South Dakota urban and community forests, 1=most important, 5=least important of the top five benefits, by respondents.

	Aesthetics	Air quality	Energy conservation	Property value	Human health	Recreation	Storm water mgt	Wildlife habitat
1	53	46	48	9	46	31	**67**	50
2	38	60	41	19	21	44	**77**	50
3	32	48	41	33	30	43	**59**	**62**
4	39	**61**	36	36	42	40	43	47
5	**57**	38	41	29	41	**59**	31	46

There was clear consensus among respondents in their opinions on the benefits of the state's urban and community forests. Management of storm water runoff was considered the most important benefit of the urban and community forest, ranking highest as a first and second choice. The third choice was storm water management and wildlife habitat. Air quality was the four choice with aesthetics and recreation being a fifth. Clearly the benefits of the urban and community forest according to the respondents lean towards the functional aspects, storm water management, habitat and air quality. A similar trend was across all geographical regions.

However, there was a difference depending upon if the respondent identified themselves as living in an incorporated city or town. While storm water management still ranked highest, wildlife habitat was not considered an important benefit, instead recreation was a higher choice.

5. Potential benefits of South Dakota windbreaks and riparian buffers, 1=most important, 5=least important of the top five benefits, by respondents.

	Snow fence	Wind protection	Wildlife habitat	Water quality	Soil conservation	Energy Conservation	Food	Aesthetic
1	58	69	58	**90**	61	8	2	2
2	49	65	57	62	**84**	16	4	10
3	56	57	68	50	**80**	21	6	7
4	52	50	**65**	53	49	39	16	19
5	45	34	**54**	37	38	**57**	26	48

The benefit of improving water quality was considered the most important value among respondents. Soil conservation was the second and third choices. Wildlife habitat was the fourth choice with it sharing the fifth choice with energy conservation.

There was a difference among respondents based upon how they viewed themselves. Respondents that identified themselves as owning range/crop land in South Dakota gave slightly more importance to wind protection and soil conservation and less importance to food.

Results of South Dakota Forest Action Plan Survey using the tools in Survey Monkey

Average Ranking

Ranking questions calculate the average ranking for each answer choice so you can determine which answer choice was most preferred overall. The answer choice with the largest average ranking is the most preferred choice.

The average ranking is calculated as follows, where:

w = weight of ranked position
x = response count for answer choice

$$\frac{x_1w_1 + x_2w_2 + x_3w_3 \ldots x_nw_n}{\text{Total}}$$

Weights are applied in reverse. In other words, the respondent's most preferred choice (which they rank as #1) has the largest weight, and their least preferred choice (which they rank in the last position) has a weight of 1. You can't change the default weights.

For example, if a Ranking question has 5 answer choices, weights are assigned as follows:

- The #1 choice has a weight of 5
- The #2 choice has a weight of 4
- The #3 choice has a weight of 3
- The #4 choice has a weight of 2
- The #5 choice has a weight of 1

We apply weights in this way to ensure that when the data is presented on a chart, it's clear which answer choice is most preferred.

If you chose to include an N/A option on the Ranking question, any N/A responses will not factor into the average ranking.

Using weighted average:

Top 5 *threats* based on all responses in all categories:

#1 Insects & Diseases [289/352 responses]; **#2 Invasive Species** [211/352 responses]; **#3 Wildfire** [184/352 responses]; **#4 Land Use Change** [162/352 responses]; **#5 Lack of Active Forest Management** [160/352 responses]

The top 5 important *forest benefits* based on all responses in all categories:

#1 Plant & Wildlife Habitat [304/350 responses]; **#2 Water Quality** {259/350 responses]; **#3 (tied) Recreational Opportunities/Air Quality** [218/350-218/350]; **#4 Biological Diversity** [141/350]; **#5 Wood Products** [136/350]

The top 5 important *urban & community forestry* benefits based on all responses in all categories:

#1 Water Quality [277/350]; **#2 Wildlife Habitat** [255/350] **#3 Air Quality** [253/350]; **#4 Aesthetics** [219/350]; **#5 Recreational Opportunities** [217/350]

The top 5 important benefits of *Agroforestry* based on all responses in all categories:

#1 Soil Conservation [311/348]; **#2 Wildlife Habitat** [302/348]; **#3 Water Quality** [292/348]; **#4 Wind Protection** [275/348]; **#5 Controlling Wind Driven Snow** [260/348]

APPENDIX G: Stakeholders Identified for Forest Action Plan

- Audubon Society Chapter Services Office
- Black Hills Council of Governments
- Black Hills Invasive Plant Partnership
- Black Hills Resilient Forestry Parternship
- Central Plains Water Development District
- Cheyenne River Sioux Tribe
- County Commissions
- Crow Creek Sioux Tribe
- Dakotas Society of American Foresters
- Ducks Unlimited, Inc.
- East Dakota Water Development District
- First Planning & Development District
- Flandreau Santee Sioux Tribe
- James River Water Development District
- Lower Brule Sioux Tribe
- Northeast Council of Governments
- Oglala Sioux Tribe
- Pheasants Forever
- Rocky Mountain Elk Foundation
- Rosebud Sioux Tribe
- Rural Water Systems
- SD Arborist Association
- SD Ass'n of Rural Water Systems
- SD Association of Conservation Districts
- SD Association of County Commissioners
- SD Community Forestry Advisory Council
- SD Conservation Districts
- SD Department of Environment & Natural Resources
- SD Department of Game, Fish, & Parks
- SD Forest Stewardship Coordinating Committee Members
- SD Lakes & Streams Association
- SD Private Professional Foresters
- SD Tree Cities USA
- SD Tree Farm Committee Members
- SD Wild Turkey Federation
- Sierra Club
- Sisseton-Wahpeton Sioux Tribe
- South Central Water Development District

- South Dakota Invasive Species Management Association
- South Dakota Wildlife Federation
- Southeastern Council of Governments
- Standing Rock Sioux Tribe
- State Conservation Commission
- Stewardship Forest Landowners
- The Nature Conservancy
- Third Planning & Development District
- Trout Unlimited - National Office
- US Army Corps of Engineers
- US Fish & Wildlife Service
- USDA FS Black Hills National Forest
- USDA FS Buffalo Gap National Grasslands
- USDA FS Cedar River Grassland
- USDA FS Dakota Prairie Grasslands
- USDA FS Fort Pierre National Grasslands
- USDA FS Grand River Grassland
- USDA Natural Resource Conservation Service
- USDA NRCS State Technical Committee
- USDA Resource Conservation & Development Districts
- USDI Bureau of Land Management
- USDI NPS Badlands National Park
- USDI NPS Jewel Cave National Monument
- USDI NPS Lewis & Clark Nat'l Historic Trail
- USDI NPS Minuteman Missile Nat'l Historic Site
- USDI NPS Missouri National Recreational River
- USDI NPS Mount Rushmore National Memorial
- USDI NPS Wind Cave National Park
- Vermillion Basin Water Development District
- West Dakota Water Development District
- West River Water Development District
- Yankton Sioux Tribe

APPENDIX H: Wildlife, Threatened & Endangered Species

The following table shows the wildlife species that are listed as threatened or endangered by the federal government, state government, or both. The species listed are either currently found in South Dakota or have been in the recent past. The table lists the five major forest types in South Dakota and which species is known to use each of the forest types for their habitat.

The ranking systems were developed by The Nature Conservancy and are currently maintained by NatureServe (http://www.natureserve.org/). Ranks range from 1-5, with 1 being critically imperiled and 5 being secure. The G ranking refers to the species' status globally and best describes the risk of extinction. The G ranking followed by a number then T represents a subspecies and followed by Q means the taxonomic status is questionable. The numbers associated with these other letters is based on similar criteria as the global rank.

The S ranking refers to the species' status within a state's boundary, which in this table represents South Dakota. SB refers to 'State Breeding' status, generally used in conjunction with SN Rank to describe the species status during the nonbreeding seasons. The S followed by an X means the species is currently extirpated within the State. SH refers to species which have historical occurrences in the state but have not been verified in the past 20-40 years but may be rediscovered. If an 'A' is listed after the state ranking it represents a 'State Accidental', which is not expected to be found in the State on a predictable basis.

		Does the species utilize forests as part of their habitat? If so, what types:							
Federally listed species	State listed species	Coniferous	Upland Hardwoods	Bottomland Forests	Shelterbelts & Windbreaks	Urban Forests	Common Name	G_RANK	S_RANK
Endangered							American Burying Beetle	G2G3	S1
	Threatened			Yes			American Dipper	G5	S2
	Endangered						Banded Killifish	G5	S1
Endangered	Endangered						Black-footed Ferret	G1	S1
	Endangered						Blacknose Shiner	G5	S1
Threatened							Dakota Skipper	G2	S2
	Threatened			Yes			Eastern Hognose Snake	G5	S2
Endangered	Endangered						Eskimo Curlew	GH	SH
	Threatened						False Map Turtle	G5	S3
	Endangered						Finescale Dace	G5	S1
Endangered							Gray Wolf	G5	
Endangered							Higgins Eye	G1G2	S1
Endangered	Endangered						Least Tern	G4	S2B
	Threatened						Swift Fox	G3	S1
Threatened							Leedy's Roseroot	G5T1	S1
	Endangered						Lined Snake	G5	S1
	Threatened						Longnose Sucker	G5	S1
Threatened		Yes	Yes	Yes			Northern Myotis (Northern Long-eared Bat)	G4	S3
	Threatened						Northern Redbelly Dace	G5	S2
	Threatened			Yes			Northern River Otter	G5	S2
	Threatened	Yes		Yes			Osprey	G5	S1B
Endangered	Endangered						Pallid Sturgeon	G2	S1
	Threatened						Pearl Dace	G5	S2
	Endangered						Peregrine Falcon	G4	S1
Threatened	Threatened						Piping Plover	G3	S2B
Endangered							Powesheik Skipperling	G1	S2
Threatened							Rufa Red Knot	G4T2	
Endangered							Rusty Patched Bumblebee	G2	
Endangered							Scaleshell	G1G2	S1
Threatened							Shovelnose Sturgeon	G4	S4
	Endangered						Sicklefin Chub	G3	S1
	Threatened						Sturgeon Chub	G3	S2
Endangered							Topeka Shiner	G3	S2
Threatened							Western Prairie Fringed Orchid	G3	SH
Endangered	Endangered						Whooping Crane	G1	SNA