South Dakota Forest Action Plan

National Priorities Section & Five Year Review

September 2020

EXECUTIVE SUMMARY

The 2020 South Dakota Forest Action Plan (SDFAP) is made up of five sections: The South Dakota Assessment of Forest Resources, Priority Area Determination, the Forest Legacy Assessment of Need, the South Dakota Statewide Forest Resource Strategy, and associated appendices. This report serves as the National Priorities Section for the 2020 SDFAP update and a five year review of actions taken to implement the 2010 Forest Action Plan across South Dakota since the last review in 2015. The review will highlight the successes and challenges faced over the past five years across the different resource conservation and forestry programs. Each program area/project contributes to the National Priorities and Objectives as seen in the crosswalk at the end of this document.

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1.0 INTRODUCTION:

The South Dakota Forest Resource Strategy was created in June 2010 to provide a long-term, comprehensive, coordinated strategy for investing state, federal, and partner resources. The purpose of this strategy is to provide a comprehensive management plan for priority areas identified in the assessment. The resource strategy details threats, strategies, existing resources, needs, and partners. The threats and strategies described here were assembled with input from the South Dakota Forest Stewardship Coordinating Committee (FSCC), the South Dakota Community Forestry Advisory Council (SDCFAC), resource professionals and forest landowners. The input from the FSCC and the SDCFAC came from numerous meetings with the two groups, and during a face-to-face work session. Input from resource professionals and forest landowners was obtained through the questionnaire that is described in the South Dakota Statewide Assessment of Forest Resources (SAFR) (Hocking et al, 2010).

The United States Forest Service requires the State Forester conduct a review of the existing South Dakota Forest Resource Strategy every five years. In addition, the State Forester must develop a National Priorities Section describing actions and success stories contributing to each of the National Priorities.

South Dakota has completed a review of its Forest Resource Strategy. This document serves as the National Priorities section and the five year review of the plan.

1.1 Forest Health Program

South Dakota's forests consist of coniferous (75%), bottomland hardwood (3%), upland hardwood (20%), urban and community and windbreak/shelterbelt forests (2% combined). The coniferous forests, which are predominantly ponderosa pine, are primarily located in the Black Hills, but also extend into Harding County in the northeast part of the state, and east into Todd County in the south-central part of the state.

The threats to South Dakota's forest resource continue to shift as the most recent mountain pine beetle (MPB) epidemic has ended and public focus has turned toward the emerald ash borer (EAB), an invasive insect that spread from other states to South Dakota and was identified here in 2018. The EAB infestation, and costs associated with treatment and/or removal of ash trees, will have a large impact on cities and towns throughout the state as many communities widely planted ash as street and park trees. Based on our most recent data from 85 communities inventoried, 32.8% of the urban canopy in South Dakota is made up of ash trees, while some communities have as much as 60% of their urban canopy comprised of green ash alone. Threats to other forest types in the state include declining natural regeneration of key species, exotic and invasive pest species (both currently present and looming), disease, and land-use changes.

The Forest Health program supports the South Dakota Forest Action Plan by utilizing eight strategies identified therein to address threats to forest health. The program also utilizes strategies to address threats of wildfire, weeds and invasive species, water quality degradation, and over mature and dying trees as identified in the Forest Action Plan. These strategies achieve the "Protect Forests from Harm" theme outlined by the State & Private Forestry (S&PF) National Priorities and Objectives. Examples of the strategies outlined in this document include, but are not limited to:

- Monitor forest insect and disease outbreaks.
- Provide forest management technical assistance to private forest landowners.
- Collaborate with other federal, state, and local agencies.
- Provide financial incentives to help private forest landowners implement healthy forest practices.
- Develop direct suppression and preventive management options to suppress forest insect and disease outbreaks.
- Suppress wildfire and reduce wildland fuel hazard threats.

1.1.1 Trapping and monitoring

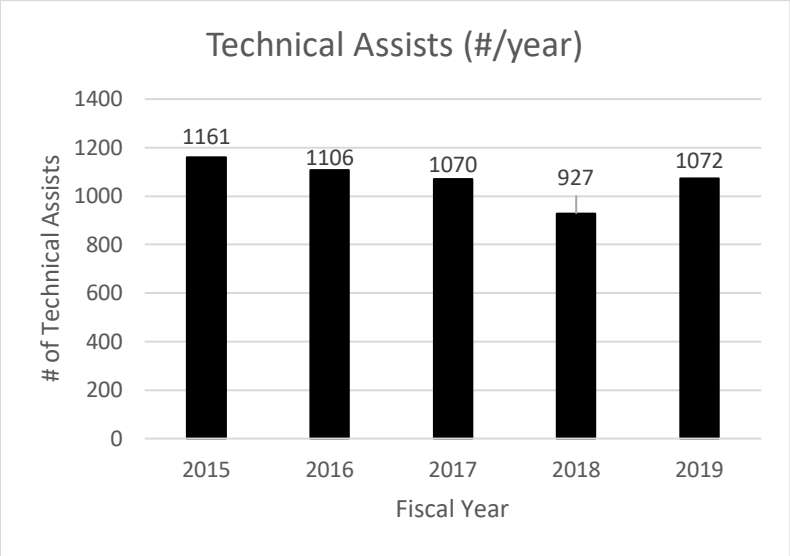
From 2015-2019 the Division of Resource Conservation and Forestry (RCF) trapping and monitoring efforts included annual placement of sixty-six gypsy moth traps throughout the state at campgrounds, rest areas, and tourist destinations. Two single adult male gypsy moths have been captured in traps placed by RCF staff in 2017 and 2019 respectively and follow up from APHIS showed no signs of established populations.

Lindgren funnel traps continued to be placed annually at three large sawmills throughout the Black Hills to trap pine engraver beetle which can kill pine trees on surrounding properties when beetle populations are high. RCF had placed and monitored pine engraver beetle traps within Custer State Park for the past two years as well. Monitoring efforts within Custer State Park were focused inside the footprint of the Legion Lake Fire that occurred in December of 2017 where 53,000 acres burned, and tree stress and mortality was high. A total of 117 traps were used for trapping and monitoring pine engraver beetles in 2019.

With the detection of EAB in Sioux Falls in 2018, RCF has begun monitoring the population and spread of this invasive pest. A systematic grid of purple prism panel traps was established with eight traps placed per square mile where ash trees are accessible. Panel traps were installed at the end of May. These were checked weekly during the flight period. A total of 72 adults were captured in four traps during the summer of 2018. Panel traps were placed in similar locations, though different ash trees, in 2019. A total of 83 adult beetles were captured in 2019 and these were all collected from trees in the core area of the infestation.

There is a joint federal/state quarantine involving the SD Department of Agriculture and the USDA, Animal Plant Health Inspection Service, Plant Protection and Quarantine (APHIS-PPQ). It regulates all life stages of the exotic insect, emerald ash borer *(Agrilus planipennis)*. The quarantine also regulates the movement of ash materials including but not limited to ash nursery stock, ash logs, ash lumber, hardwood firewood (non-coniferous), ash chips/mulch, and wood packing material constructed of ash. The state quarantine area includes all of Minnehaha County, Lincoln County and Turner County.

In April 2020, a second population of EAB was identified in Canton, SD, roughly 25 miles from the original infestation in Sioux Falls. In July 2020 EAB was discovered in Worthing, SD about nine miles west of Canton. These newly identified infestations fall within the existing state quarantine area. Information on EAB, management options, and the status of the insect within South Dakota can be found on the regularly updated website https://emeraldashborerinsouthdakota.sd.gov/



1.1.2 Community Forestry Health Assistance

RCF responded to an average of 1,067 technical assists per year during the last five years. See Figure 1 for data from 2015-19.

RCF completed seven community Dutch elm disease surveys between 2015-2019. Approximately 70 trees were identified as infected, marked for removal, and subsequently removed.

RCF has compiled 85 community street tree inventories across the state. This data will provide information when planning for management of emerald ash borer. In Sioux Falls, where the EAB infestation was first reported, RCF began a street tree inventory with the assistance of Master Gardeners and GPS units provided by the Division. Approximately 250 infested trees were identified by initial delimiting survey by crews from the South Dakota Department of Agriculture in 2018. Another 53 trees have been identified in 2019 and survey work is on-going.

1.1.3 Weekly Pest Updates and Pest Bulletins

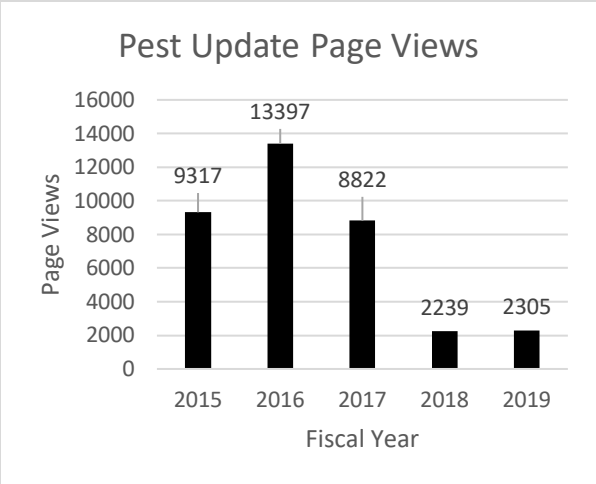


Figure 1 Pest Update Page Views by Year

In conjunction with South Dakota State University (SDSU), Dr. John Ball creates pest updates for trees, shrubs, and landscape ornamentals which are posted on RCF's website. These updates are written and posted weekly during the growing season to highlight current plant development and insect and disease problems within the state. Landowners, individuals, and RCF field staff send pictures and samples to Dr. Ball to confirm field diagnoses, which keep the updates current regarding observations from around the state. The pest updates also include pictures and samples sent in by private individuals via e-mail in a section called "E-

samples." Timely topics are included to help landowners decide what management should occur at that time to mitigate the plant problems people are experiencing. Outside of the growing season, pest updates are published as needed; if weather events damage vegetation across a large area, care, maintenance, and removal methods may be discussed. A bulletin may be generated if a high number of requests are made for information of a specific problem.

The Pest Updates webpage has averaged 7,216 hits annually over the past five years. The link for this update is sent to 320 addresses. Some of these forward it on to agency address lists (such as Nebraska Forest Service). The distribution list addresses are mostly in SD, ND, MN, IA, NE, KS, CO, WY but have them as far as PA. These updates can be viewed at: http://sdda.sd.gov/conservation-forestry/forest-health/tree-pest-alerts/

1.1.4 Forest Health Education Workshops

RCF provided 16 EAB training workshops in 2019 with an average of 40 attendees per workshop and 27 other workshops on tree insect and disease identification, management, and education. RCF averaged 53 workshops per year for the last five years, workshop topics such as proper tree care and planting, exotic pests, first detector training, pesticide recertification, Project Learning Tree, Envirothon, and Smokey Bear and fire prevention were covered. RCF implemented a "Don't Move Firewood" poster campaign to reduce the potential for spread of pests into and around the state. Additionally, in 2020, RCF partnered with The Nature Conservancy to rent "Don't Move Firewood" billboards within our EAB quarantine area along I-90 and I-29 for traffic incoming from Minnesota and Iowa.

1.1.5 Mountain Pine Beetle Initiatives

One of the priority areas in the South Dakota Forest Action Plan is the South Dakota Black Hills. A serious threat to the ponderosa pine in the Black Hills is mountain pine beetle (MPB). Since 1996, the mountain pine beetle epidemic has dramatically affected the ponderosa pine forest of the Black Hills. MPB is a native insect and well adapted to the natural conditions of the region. The Black Hills experienced widespread epidemics in the 1890s, 1940s, 1970s, and from 1996-2016.

A partnership was formed in the Black Hills to battle the MPB epidemic. RCF, Black Hills National Forest, the Bureau of Land Management, Wyoming State Forestry, and Neiman Timber Company acquired and analyzed high resolution aerial imagery. The Mountain Pine Beetle Working Group (a partnership of industry, federal, state, & county agencies in the South Dakota & Wyoming Black Hills, & forest landowners) identified treatment priority areas on state and private lands each year based on aerial imagery

and field observations. The South Dakota Association of Conservation Districts (SDACD) was contracted by RCF to provide the labor to mark the trees to be treated. The partnership also assisted in marking trees to be treated.

- South Dakota Governor Dennis Daugaard's 2012 Black Hills Initiative (BHI) assisted private landowners affected by the MPB epidemic through FY2017. Between FY2015 and FY2017, 71,454 private acres were surveyed, and 70,547 infested trees were marked. 1,844 landowners participated in the cost share program from 2015 to 2017.

- Between FY2015 and FY2017, an all lands approach was adopted to suppress the MPB epidemic. Western Bark Beetle grants, and state appropriated funds were used in conjunction with a 2012 $300,000 competitive grant from the US Forest Service State and Private Forestry program to mark and treat state and private lands whereas state appropriated and local funds were used to treat National Forests. RCF contracted with the SDACD to locate and mark infested trees on federal lands adjacent to state and private lands. In total, 14,629 acres were surveyed and 66,899 MPB infested trees marked from 2015-2017.

- Our efforts to mitigate the effects of Mountain Pine Beetle (MPB) in Custer State Park (CSP), including survey and marking for MPB, have been ongoing since 2005. Between 2015 and 2017, approximately 30,000 green infested trees were identified, with the majority being treated through salvage and cut and chunk efforts. The number of acres surveyed differed each year and ranged from 15,000 to 35,000 acres.

- From 2015-2017, 66 limber pines found in the Cathedral Spires area of Custer State Park were treated annually with anti-aggregate pheromones or preventative spray to protect them from mountain pine beetle attack. The limber pines are part of a rare, native, and endemic population known to remain in the Black Hills of South Dakota. They have received National Natural Landmark status from the National Park Service and are of special importance to Custer State Park.

- Other MPB suppression activities in the park include lethal baiting, which is baiting pesticide sprayed trees, baiting and girdling trees, and other chemical pheromone studies to reduce potential for MPB infestation. Custer State Park was proactive in preventative spraying of legacy trees through FY2018.

Our records indicate most properties that participated in the survey and marking program for more than one year saw decreasing numbers of infested trees in subsequent years.

1.1.6 MPB Management Analysis

The recent mountain pine beetle epidemic in the Black Hills and West has generated debate as to the effectiveness of management in reducing tree mortality. A unique opportunity has surfaced in South Dakota where a wilderness area is adjacent to a state park where various management techniques were used. The objective of this study is to quantify the effectiveness of various treatments in slowing tree mortality based on 1) stand density, 2) soil quality, and 3) tree growth rates. The data has not been fully analyzed yet, however no correlation has been found between tree mortality and soil quality, average diameter, or tree growth rates.

Future analysis will be focused on infestation timing for each plot as this could explain why larger diameter trees survived the epidemic. A chi-square analysis will be made showing the effects of various treatments, i.e. thinning, sanitation, have on slowing tree mortality, along with a Tukey-Kramer post hoc analysis.

1.1.7 Herbicide Damage

Due to the increased use of dicamba and 2,4-D resistant crops there is a need for better information on how to identify and determine the impact of low-levels or repeated applications of these herbicides on trees. In 2018 and 2019 samples were collected from windbreaks or rural communities in five states (Illinois, Indiana, Missouri, Nebraska, and South Dakota). Samples came from numerous coniferous and deciduous tree species showing apparent symptoms of herbicide damage. The most common species received was bur oak (*Quercus macrocarpa*).Nearly all of the samples received tested positive for both dicamba and 2-4D in concentration levels that can cause herbicide damage symptoms in trees.

In addition to collected samples in 2020, the metabolization rate for six common tree species will be analyzed, three with preformed growth (red oak, white oak, and white spruce), and three with sustained growth (hackberry, honeylocust, and Siberian elm). Ten trees of each species will be exposed to drift of a known concentration of 2,4-D and dicamba and tissue collected at 1, 2, 3, 4, 6, and 8 weeks following the application. Weather data, precipitation and temperature, will also be collected during this period as well as the appearance and progression of symptoms and shoot extension. The applications will be made at leaf expansion and then repeated on an additional 10 trees at mid-season.

1.2 Forest Stewardship Program

Established through the 1990 Farm Bill, the Forest Stewardship Program (FSP) encourages private forest landowners to manage their lands using professionally prepared forest stewardship plans. In addition to forest stewardship plan preparation, FSP is an important source of funding for forest management technical assistance provided by RCF.

The Forest Stewardship Program supports the South Dakota Forest Action Plan by utilizing 37 strategies to address all three national themes (Conserve Rural Forests; Protect Forests from Harm; Enhance Public Benefits from Trees and Forests) outlined by the State & Private Forestry (S&PF) National Priorities and Objectives. The program utilizes strategies to address all 14 threats identified in the Forest Action Plan. Examples of the strategies outlined in this document include, but are not limited to:

- Maintain forest land in agricultural classification
- Provide forest management technical assistance
- Educate landowners
- Prepare and implement Forest Stewardship Plans
- Promote use of woody biomass
- Work with other agencies to discourage forest fragmentation
- Provide financial incentives to implement management
- Promote species diversity
- Riparian forest management and enhancement
- Develop and monitor BMP's
- Coordinate with NRCS
- Promote windbreak renovation

1.2.1 Landowner Assistance

From 2015 to 2019, RCF rural foresters provided 1,109 private landowners with technical assistance with forest stewardship plans, timber management information, and general forestry help. The foresters provided 689 landowners with prairie forestry assistance.

In the five year period of 2015 to 2019, RCF foresters wrote or approved 101 new or updated forest stewardship plans covering 36,133 acres. The total acreage in the state covered by a forest stewardship plan is 47,880 acres.

1.2.2 Non-commercial Thinning Assistance

RCF rural foresters provided technical assistance for two programs that help private forest landowners thin their non-commercial forest lands. Technical assistance provided through FSP serves as a gateway directing private forest landowners to state and federal programs and leveraging cost-share funds that help landowners treat acres. The USDA Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP) and the SD Conservation Commission's Coordinated Natural Resources Conservation Grant Fund (CNRCGF) grant program provided funds to private forest landowners for timber stand improvement projects. The NRCS provided funds to RCF that are matched by state funds to administer the EQIP forestry practices. Technical assistance for the CNRCGF thinning grants and projects that receive no cost share is funded by the FSP and state matching funds (Table 1).

Accomplishments for 2015 through 2019 include: 96 EQIP Practices (Thinning, Brush Management, Meadow Enhancement) covering 1,727 acres; assistance to 22 landowners on Conservation Commission Grant forestry projects covering 336 acres; 10 projects completed without cost share covering 264 acres. Dollar values of this assistance is shown below (Table 1).

NRCS Tech Assistance (3 years)		
EQIP & CSP	$	35,935.00
Agroforestry	$	16,206.00
Total	$	52,141.00
NRCS Cost Share EQIP&CSP (Approx.)	$	433,000.00

Coordinated Natural Resources Conservation Grant Fund for Forestry Practices (5 years)		
Commission Funds	$	112,114.00
Matching Funds	$	172,884.00

Table 1 - Dollar amount for the technical assistance leveraged by FSP and state match and provided to landowners through the NRCS, and Conservation Commission grant funds used for forestry practices.

1.2.4 Tree Farm Program

The American Tree Farm System is a recognition and forest certification program for private landowners. Landowners must own at least 10 contiguous acres of forest land to be eligible for the program. The Tree Farm Program complements the Forest Stewardship Program by encouraging private forest landowners to manage their forest lands. The Tree Farm Program in South Dakota is the main effort of the South Dakota Family Forests Association (SDFFA). RCF supports the Tree Farm Program in South Dakota by providing leadership to SDFFA, helping SDFFA administer the program, helping teach and certify inspecting foresters, and by certifying and inspecting Tree Farms. All RCF rural foresters are certified to inspect and certify Tree Farms, and State Forester Greg Josten serves on the SDFFA board of directors.

The tree farm program in South Dakota underwent significant changes in the 2015-2019. In 2015, SDFFA voted to continue as a certification program and in 2019 became a fee-based membership program. There are currently 125 certified tree farms in the state covering 21,343 acres. From 2015-2019, RCF foresters certified 58 tree farms totaling 11,508 acres.

In 2007, SDFFA established a program to help landowners hire consultant foresters to prepare forest stewardship plans for their property and become certified Tree Farms. Funds were provided by Neiman Timber Co. RCF provided $13,000 to support this effort. RCF has continued to support this program with multiple grants of $10,000. The program has helped 54 landowners obtain Forest Stewardship Plans for their properties encompassing 10,426 acres of certified Tree Farms.

1.3 Agroforestry Assistance

Assistance and planning by RCF rural foresters resulted in the planting of 12,706 new trees and shrubs covering 40.22 acres of land. Foresters reviewed and approved 639 tree plans for funding under the CNRCFG from 2015-2019. Tree plantings support the State Forest Action Plan strategies of expanding species diversity and providing a younger age class of trees to offset over mature and dying trees that are rendering windbreaks ineffective.

1.3.1 NRCS Cooperative Work

RCF entered into the current contribution agreement with the NRCS in 2013 to provide services for landowners interested in using EQIP for management on their property. RCF contributes 50% of the cost of technical assistance. The services provided were

needs assessment, design, practice layout, development of practice plan, and certification of completion. The practices to be implemented included forest stand improvement, firebreak, forest slash treatment, and brush management.

RCF entered into a contribution agreement with the NRCS in 2013 to provide agroforestry services that include training of forestry and windbreak practices, technical assistance, and document reviews. RCF contributes 25% of the costs for these services. From 2015-19, RCF provided six training workshops for NRCS personnel with 208 participants.

1.3.2 Windbreak Condition Grant

According to the 1992 US Geological Survey, America's Northern Plains, Overview and Assessment of Natural Resources, there are about 12 million acres of cropland in South Dakota and about 4 million acres are considered highly erodible by USDA. Research supports that windbreaks can have a significant impact in reducing wind erosion, increasing crop yields, conserving energy, and increasing economic benefits of livestock operations.

The Windbreak Condition Project is a result of a 2014 $150,000 US Forest Service (USFS) Competitive Grant (now Landscape Scale Restoration Grants) award to assess the condition of windbreaks in high priority areas in eight counties in South Dakota. The project utilized Geographic Information System (GIS) and remote sensing techniques and field survey methods to identify windbreak locations and assess the primary function and condition of the windbreaks in an eight county area of South Dakota: Aurora, Davison, Douglas, Hanson, Hutchinson, Jerauld, Sanborn, and Yankton counties. Sites that are small blocks of trees within maintained lawns, naturally forested riparian areas, ditch/road banks and fence lines were excluded from this project.

There were two phases to the Windbreak Condition Project: Phase one was a cooperative project with Kansas Forest Service (KFS) and Phase two was done solely by RCF staff. Both phases included field inventory but only field data was used to assign condition in Phase two.

In Phase one, a total of 16,535 individual windbreaks were identified using the windbreak intercept tool developed by USFS Northern Research Station and the total acres of windbreaks were calculated at 42,512. In 2016, the ground truthing was completed for each of the eight counties. There was a total of 231 windbreaks measured, 10,694 trees and 3,227 shrubs logged between the eight counties. The field data collected in Phase one indicates that 49% of the windbreaks in this project area were in poor condition. The aerial photo analysis indicated that 45% of windbreaks were in poor condition. Aerial photo analysis also classified 16% more windbreaks as fair and 13% more as good when compared to field data collection.

In Phase two, the number of individual windbreaks was not totaled since the windbreak intercept tool was not available for use. In 2018 field measurements were completed on 225 windbreaks. A total of 7,447 tree and 1,687 shrubs recorded in the eight counties. The field data collected for Phase two indicates that 74% of the windbreaks in this project area were in poor and fair condition. This represents the same percentage that was in Phase one field checks.

With the data collected in the Windbreak Condition project RCF was able to obtain a Conservation Collaboration Grants or Agreements (CCGA) grant from the NRCS to hire a forester to broaden technical assistance and implement an education and outreach campaign to increase participation in renovating windbreaks in the eight county area of Phase one.

1.3.3 Collaborative Conservation Grant & Agreement (CCGA)

RCF received a $215,583 Collaborative Conservation Grant and Agreement (CCGA) grant from NRCS in FY2019. The CCGA funds are used to employ a new service forester for three years to work on windbreak renovations in the eight-county area analyzed during the Windbreak Condition Project (Sanborn, Jerauld, Aurora, Davison, Hanson, Hutchinson, Douglas, and Yankton). The Windbreak Condition Project completed in 2016 showed that the majority of windbreaks in this eight-county area were in fair to poor condition.

As part of this project, RCF will recruit landowners within the eight-county area to sign up for windbreak renovation through EQIP. RCF will also provide all necessary technical assistance to the landowners and prepare the windbreak renovation plans.

1.3.4 Great Plains Initiative 2 (GPI2)

In 2018, the Great Plains initiative (GPI2) started with a two phase plan to evaluate windbreaks within four midwestern states. The first phase uses remote sensing and geographic information systems (GIS), combined with on-the-ground evaluations to assess the extent and condition of windbreaks across Kansas, Nebraska, South Dakota, and North Dakota. This process, referred to as Trees Outside of Forests Image Inventory (TOFii), was developed by the US Forest Service Research Forest Inventory and Analysis Program. It involves the states digitizing TOF on 2014 National Agriculture Imagery Program (NAIP) imagery, and Forest Service personnel analyzing polygons to differentiate linear shapes (windbreaks) from irregular shapes (riparian buffers). As of September 2020, all 66 counties have been digitized. Phase two will use remote sensing and GIS, combined with on-the-ground evaluations, assess the extent and condition of riparian buffers across the four states. In 2018, the ground evaluations

for Phase one started in each county in South Dakota except those included in the Windbreak Condition Project. Ten windbreaks were evaluated in each county from the roadside and one windbreak received an in-depth measurement. In-depth measurements included tree species, height, diameter, condition of the windbreak, and windbreak porosity. The ground evaluations for each county in South Dakota were completed in FY2019.

1.4 Good Neighbor Authority (GNA)

RCF entered into a GNA Master Agreement with Regions 1 and 2 of the USDA Forest Service to provide forestry assistance on national forest lands within South Dakota. In 2019 a supplemental project agreement was finalized to begin work on the Black Hills National Forest. A Joint Powers Agreement (JPA) was entered between RCF and the Pennington Conservation District to hire a crew to complete duties related to timber sale preparation across the three ranger districts in the Black Hills.

The GNA Crew began working in the Black Hills National Forest in September 2019. They have been completing timber sale preparation duties for the Hell Canyon and Mystic Ranger Districts. The following is a breakdown of the work completed by the GNA crew as of December 31, 2019:

- 26 cutting units on the Blacktail Timber Sale in Hell Canyon RD
    - Total 1,580 acres laid out
    - 570 acres included interior leave-tree marking
    - Four distinct harvest prescriptions
        - Commercial Thin (6 units totaling 214 acres)
        - Group Shelterwood (7 units totaling 452 acres)
        - Overstory Removal (8 units totaling 494 acres)
        - Pine Encroachment (5 Units totaling 420 acres)
- Nine cutting units completed on Oreville Timber Sale in Mystic RD
    - Total 158 acres laid out
    - All units are Overstory Removal
    - Other units were evaluated and not included due to various reasons including:
        - Stand Type
        - Volume
        - Terrain
        - Areas to Protect (streams/wildlife)

1.5 Urban and Community Forestry Program

Since 1972, RCF has offered community forestry technical assistance to individuals, service organizations, non-profit groups, and communities. RCF's community forestry team offers technical assistance for the establishment of tree boards, development of tree ordinances, organization of community tree inventories, identification and control of insect and disease problems, and assistance with grant preparation and administration. Educational programs on tree selection, planting, health, and maintenance are available for communities, schools, and other organizations. RCF focuses its efforts on assisting communities with the development of local community forestry programs.

By 2019, 67% of the population in South Dakota was living in communities with managed urban forestry programs. Over four hundred forty-one thousand people lived in communities that were receiving forestry technical assistance from the community's staff forester, a contractor, or a RCF forester. There are 602,319 people living in South Dakota communities that have the potential to develop an urban forest management program. In 2019, over 16,033 volunteer hours were logged as part of community forestry programs.

South Dakota has 106 local tree boards that provide the foundation for most of the community forestry programs in South Dakota. These boards consist of community leaders, city employees, and volunteer citizens. Tree boards are vital to the development of tree ordinances, preparation of annual work plans, tree plantings, tree maintenance, and tree removals. The boards provide their citizens with information, secure and administer grant funds, and conduct local Arbor Day activities.

RCF awarded UCF Comprehensive Challenge Grants to 33 communities and organizations for projects totaling $171,463 between 2015 and 2019. Thirty-seven of the projects involved planting new trees, three projects were for tree care, three projects for inventory and assessment, and six projects were for education and training.

Over the last five years, RCF foresters provided an average of 242 assists annually to community governments, volunteer/service groups, and private citizens in over 80 different communities per year resulting in a total of 967 technical assists. An average of 52 presentations on urban forestry and Arbor Day, and Smokey Bear appearances were conducted annually since 2015.

The UCF Program supports the South Dakota Forest Action Plan and the following S&PF National Priority Objectives:

Objectives:

- 1.2 Identify and conserve high priority forest ecosystems and landscapes
- 2.2. Identify, manage, and reduce threats to forest and ecosystem health
- 3.1. Protect and enhance water quality and quantity

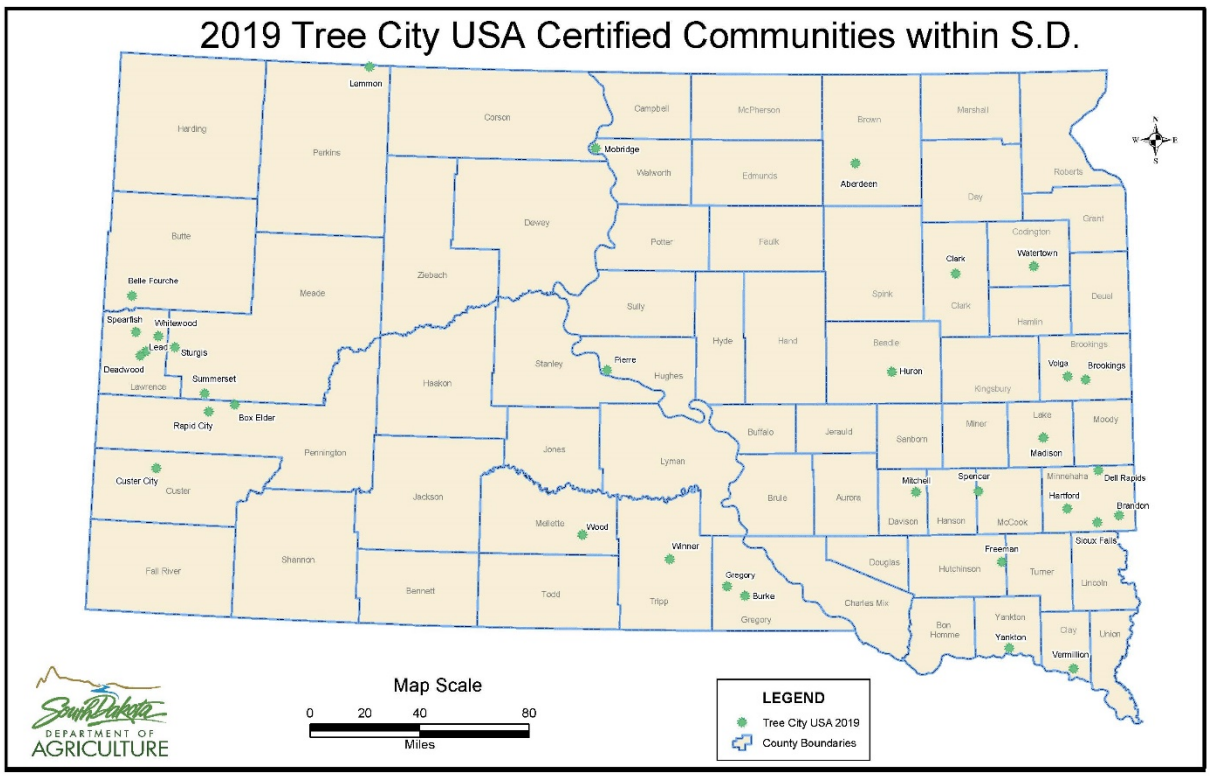
- 3.2. Improve air quality and conserve energy
- 3.4. Maintain and enhance the economic benefits and values of trees and forests
- 3.5 Assist communities in planning for and reducing forest health risks
- 3.6. Connect people to trees and forests, and engage them in environmental stewardship activities
- 3.7. Manage trees and forests to mitigate and adapt to global climate change

1.5.1 Tree City USA Program

Tree City USA is a community improvement and national recognition program for towns and cities which, in the process of effectively managing their public tree resources, meet the program's established standards. The program is sponsored by the National Arbor Day Foundation at the national level, and by RCF at the state level. In 2019, South Dakota had 32 Tree City USA communities.

To qualify for Tree City USA designation, a community must meet four standards:

1. A community tree board or other organized committee must be in place and meet regularly to oversee the urban & community forestry program;
2. An effective community tree ordinance must be developed, passed, and enforced;
3. A community forestry program funded by a minimum of $2.00 per capita must be in place; and
4. An organized Arbor Day celebration must be held, and an official Arbor Day proclamation made by the mayor or other community leaders.



1.5.2 Analyzing the Potential Impacts of EAB in South Dakota

In May of 2018, EAB was first detected in Sioux Falls. Through work with Agricultural Services, a quarantine for the movement of firewood, ash nursery stock, ash logs, ash lumber, ash chips or mulch, and any ash wood packing material was enacted to help slow the spread of the pest across the state by way of major interstates. According to RCF inventory data, ash is a major component of our urban forests with over 30% of the street trees in the state were ash and some communities having up to 60% ash.

In the summer of 2019, RCF signed a three-year contract with Plan-It-Geo to provide TreePlotter to small and mid-size communities to track their community tree inventory with ease. Through this web-based tool communities can view city trees, analyze them, and have access to an EAB calculator that will help them estimate the financial effects this pest will have on their town and community trees. With an easy to use tool, municipalities, decision makers, and the public will have the necessary tools to manage their community forests. As a result, small and mid-size communities will have the opportunity to track their trees even if they do not have dedicated forestry staff or software in place. Currently there are over 80 inventories within the system. With these prior inventories, communities can save time by just updating an existing inventory.

1.5.3 Forestry Work and Tribal Relations

In 2017 and 2018, Parmelee was awarded an Urban and Community Forestry Challenge Grant to plant trees. RCF assisted a local nonprofit organization secure funds, select trees, and plant trees at their Pow Wow grounds and baseball fields.

RCF foresters also did presentations at three annual Todd County Elementary Environmental Fairs in Mission (Rosebud Sioux Reservation). This fair was focused on educating students about trees, forestry tools, and different products that trees are used to make in everyday life.

1.5.4 Environmental Education through Project Learning Tree

Project Learning Tree (PLT) advances environmental literacy and promotes stewardship through excellence in environmental education, professional development, and curriculum resources that use trees and forests as windows on the world. PLT seeks to develop students' awareness, appreciation, skills, and commitment to address environmental issues and to provide a framework for students to apply scientific processes and higher order thinking skills to resolve environmental problems. To help students acquire an appreciation and tolerance of diverse viewpoints on environmental issues and develop attitudes and actions based on analysis and evaluation of the available information. PLT encourages creativity, originality, and flexibility to resolve environmental problems and issues. PLT wants to inspire and empower students to become responsible, productive, and participatory members of society.

In South Dakota, PLT is a 501 C Non-profit directed by a Board of Directors who represent financial and program support. SD PLT is sponsored through grants from RCF, National PLT and Bureau of Land Management. Pledge sponsorships are also received from the Sustainable Forestry Initiative, Black Hills Energy, South Dakota Lumberman's Association, Neiman's Timber Products and Baker Timber Products. In addition, Dakotas Society of American Foresters and the South Dakota Family Forests Association support the program.

Since the program was introduced to South Dakota in 1985, over 1,500 educators have received training in PLT. South Dakota universities which presently offer PLT graduate credits are Northern State in Aberdeen, University of South Dakota (USD) in Vermillion, Black Hills State in Spearfish, and Capital University Center in Pierre (CUC). From 2015 through 2019, PLT has reached nearly 31,500 South Dakotans of all ages through classroom and outdoor education workshops and field days. In addition, approximately 630 new PLT educators have been trained over the last five years.

1.6 Forest Legacy Program

RCF is the lead agency for administering the Forest Legacy Program (FLP) offered by the USDA Forest Service. The program allows RCF to purchase forest land and permanent conservation easements from willing sellers with FLP funds to keep the land as a working forest. The Federal program is used to purchase development rights from willing sellers but allows landowners to continue to own their land and retain all other rights to the property including the right to sell the property. However, South Dakota state law does not allow state agencies to own easements; therefore, Forest Legacy purchases in the state must be fee simple acquisitions. ‘

1.6.1 Blood Run

The Blood Run Area consisted of privately owned 236 acres of cropland, grassland, upland and riparian forests along the Big Sioux River in eastern South Dakota. The South Dakota Forest Action plan places a high priority on the conservation of riparian forests. The area is also of cultural significance to several Native American tribes. As a result of its ecological and cultural uniqueness, the Blood Run site was a prime candidate for protection. Using Forest Legacy funds RCF partnered with the South Dakota Department of Game, Fish and Parks (GFP), the South Dakota Parks and Wildlife Foundation, and The Conservation Fund to acquire the site from private ownership. The first property was purchased in 2014 and two additional tracts were purchased in 2016 and 2017. RCF drafted a stewardship plan for the property to guide future management to protect the ecologic value of the site. GFP is managing the Blood Run property as part of Good Earth State Park.

Since 2015, approximately 24,000 trees and shrubs have been planted across 17 acres. The planted acres are monitored annually to determine success and mortality of the reforestation efforts. In 2016, RCF staff wrote another Forest Stewardship plan for a 12.45 acre parcel, of which 9.14 acres is forested. RCF staff continue to monitor the implementation of the stewardship plans and make forest management recommendations to GFP.

The Blood Run Forest Legacy Project supports the South Dakota Forest Action plan by utilizing eight strategies and address all three national themes (Conservation Rural Forest, Protect Forest from Harm, and Enhance Public Benefits from Trees and Forests) outlined by the state and private forestry (S&PF) National Priorities and Objectives. The strategies used addresses 10 threats identifies in the forest Action Plan. Examples of the strategies are as followed:

- Create public awareness and educate the public about forest fragmentation

- Work with other Federal, State, and Local agencies to discourage fragmentation of Forest Lands
- Collaborate with and engage Federal, State, and Local land managers to improve Forest Health
- Promote natural species diversity within native forest lands
- Encourage the planting of a diverse mix of trees species
- Work with The South Dakota Department of Game Fish and Parks to help implement strategies found in the Wildlife Action Plan

1.7 Natural Resources Conservation Program

The Coordinated Natural Resources Conservation Grant Fund was established by the State Legislature in 1992 to implement goals and objectives identified in the South Dakota Coordinated Plan for Natural Resources Conservation. The plan targets reduction of soil erosion, improvement of rangelands, and improvement of water quality and quantity, enhancement of wildlife habitat, increased public awareness of natural resources, funding, and use of renewable energy.

The fund is used to direct cost share funds to South Dakota conservation districts. Grant applications are reviewed, approved, and awarded by the State Conservation Commission. RCF administers the grants on behalf of the State and the Conservation Commission.

The Resource Conservation Program supports the following S&PF National Priorities and

Objectives:

- 2.1. Restore fire-adapted lands and reduce risk of wildfire impacts
- 2.2. Identify, manage, and reduce threats to forest and ecosystem health
- 3.1. Protect and enhance water quality and quantity
- 3.2. Improve air quality and conserve energy
- 3.4. Maintain and enhance the economic benefits and values of trees and forests
- 3.5. Protect, conserve, and enhance wildlife and fish habitat
- 3.6. Connect people to trees and forests, and engage them in environmental stewardship activities
- 3.7. Manage trees and forests to mitigate and adapt to global climate change

222 projects were funded from FY 2015-2019 awarding $3,944,787 to 46 Conservation Districts. Another $7,849,722 of other funds were leveraged including federal, other state, and local sources. Every $1 of conservation funds was matched by $1.99 of other funds. 73 cropland, 61 rangeland, 26 information and education, 43 water quality, and 19 technical assistance projects have been funded.

2.0 South Dakota Wildland Fire Division

South Dakota Wildland Fire (SDWF) takes a leadership role in providing direction and organization to coordinate cooperative forest fire suppression efforts between individual landowners, local fire districts, counties, tribal, and federal governments on state and private forestlands as authorized in state law.

SDWF promotes the use of prescribed burning with the realization that rural areas can be better protected, and that catastrophic wildfire can be minimized through preventative measures in cooperation and coordination with stakeholders in protecting lives, property, and resources. Prescribed burning objectives include reducing hazardous fuels thus reducing the impact of wildland fire threats to forest and ecosystem health, enhancing water quality and quantity, and enhancing wildlife habitat.

Survivable Space Projects include hazardous fuels mitigation on private land (hand thinning with piling and burning, chipping, or removal) using either a 50%, 80% or 100% cost share program.

SDWF is persistent when working with subdivisions and identified “Communities at Risk” from wildfire to identify hazardous fuels mitigation needs and projects, implement public education programs, and perform risk assessments in accordance with National Fire Protection Association Code 1144. Identification of prospective project areas is increasingly becoming more of an interagency venture involving SDWF staff, Black Hills National Forest districts, county emergency managers, county fire coordinators, and local fire departments.

SDWF has two hand crews that suppress fires in South Dakota and throughout the United States. They are actively engaged in fuels mitigation programs which include cutting and piling fuels that are a threat to “Communities at Risk”. A variety of treatments are utilized to minimize the amount of hand piles built. Larger diameter material is hauled out for post and pole uses, having the larger diameter material removed increases efficiency of pile burning in the winter. When favorable conditions exist, the crews can burn slash piles on various fuels projects.

SDWF supports the South Dakota Forest Action Plan and the following S&PF National Priorities and Objectives:

- 2.1 Restore fire-adapted lands and reduce risk of wildfire impacts.
- 2.2 Identify, manage, and reduce threats to forest and ecosystem health
- 3.1 Protect and enhance water quality and quantity
- 3.5 Protect, conserve, and enhance wildlife and fish habitat

2.1 Fuels Mitigation

From 2015-2020, SDWF spent $7,214,873 on fuels reduction treatments funded by federal grants. 600 acres were treated by State hand crews, 1,048 acres were treated under the 100% contractor program, 258 acres were treated under the 50% cost share program, and 20 acres were treated under the 80% cost share program. These treatments are focused on reducing the amount of fuel loading within and around communities at high risk of negative impacts of wildfire.

2.2 Fire Suppression

Two full-time Assistant Fire Management Officers were hired for the Lead and Custer district offices and three full-time Engine Captains were hired for the Rapid City, Custer and Hot Springs districts to assist with seven day staffing during fire season by permanent personnel. These additional staff also allow for more office coverage during the winter for issuing burn permits and training when the Fire Management Officer/Division Chief is on assignment or training or otherwise absent. These positions were very valuable and important to the safe containment and control of the 14,000 acre Sheep Draw fire and 3,000 acre Moonshine wildfires in Harding County in spring of 2015 and the 56,000 acre Legion Lake Fire in Custer State Park and adjoining federal and private land.

For CY2015 to 2020 YTD time period, the SDWF responded to 1,729 requests in the form of resource exchange on fires, prescribed burning support, and dispatch support to federal and state partners both in South Dakota and nationwide.

2.3 Training

SDWF has moved most training to the Academy Training concept for better utilization of time, place, and to offer classes in succession to meet firefighter needs. Academies are held in three different locations with East and West River academies hosting 100/200 level classes. The Fort Pierre Academy is held in Fort Pierre which is central to the state. The Fort Pierre Academy offers 100 through 400 level classes. By hosting the classes in this manner, we can centralize them and make them more easily accessible to firefighters statewide.

3.0 Implementation Challenges over the Past Five Years

1. Emerald ash borer: Developing partnerships and responding to a multi-state EAB infestations with limited resources. Identifying new priority areas every year while establishing and maintaining a credible, effective program to mitigate the spread and impacts of the invasive insect. RCF has submitted comments regarding APHIS deregulation of this insect as this will cause additional challenges to slow its spread throughout the state.
2. Focus/Flexibility: While implementing the emerald ash borer management program, continue to implement viable and effective Forest Stewardship, Urban Community Forestry, Forest Health Protection, Forest Inventory Analysis, and Conservation programs with no increase in staff.
3. Personnel: With the high turnover rate, resources need to be directed toward the recruitment and retention of qualified employees. With decreasing budgets, RCF needs to take positive steps to improve employee retention.
4. Training: Keeping personnel up to date on forest insect, disease, continuing education, and technology training.
5. Public Engagement: Keeping the public engaged/interested in proactive forest and urban forestry management.
6. Fragmentation: Fragmentation of forest ownerships and the difficulty of managing smaller, noncontiguous blocks.
7. Landowner Education and Involvement: Private landowner interest is a constant challenge. Urban forestry is a community effort that can only thrive with the presence of concerned and enthusiastic citizens.
8. Inventory: Updating tree inventories is a big task to complete in-house with no additional staff.
9. Funding: Conservation districts do not have taxing authority nor do many receive a significant amount of their funding from other government entities. As a result, conservation districts must generate their funding through venture operations.
10. Recruitment: Recruitment of new conservation district supervisors and employees bring energy and new ways of addressing natural resource issues.
11. Strategic Thinking: Getting conservation districts to think strategically about identifying and addressing natural resource concerns on the watershed or larger scale.
12. Vision: Helping conservation districts to understand their purpose and how to use this vision to guide their activities.
13. Identity: Helping conservation districts to think beyond just providing services (tree and grass planting) that generate funds for district operations.

4.0 Implementation Focus over the Next Five Years

1. Forest Health: Keep decision makers informed of all forest health threats in and around South Dakota. Track EAB expansion. Assist communities and private landowners as they prepare for EAB and wrestle with the high cost of ash tree treatment, removal and replacement.
2. Landscape scale management: Work with USFS and NRCS to set up and fund a Two Chiefs landscape scale practice across ownership boundaries.
3. Active forest management: Maintain technical assistance and accomplish treatment acres while addressing staff shortages.
4. Windbreak renovation: The current windbreak condition project will aide in showing the need and directing efforts to the 8-county region in SE South Dakota. The project will be expanded to other areas of the state.
5. Inventory: Expand street and park tree inventories to more communities in the state with priority on communities close to confirmed EAB detections. TreePlotter will make tree tracking inventory data easier for communities. This tool also helps to estimate the burden for communities through the EAB calculator.
6. Research: Tracking and sharing information from new studies on the benefits of trees, such as the effect of green spaces on human health.
7. Response: Respond rapidly to widespread damage to South Dakota's forest resources following natural disasters (fire & weather events) and insect outbreaks (native & invasive).
8. Partnerships: Work with other agencies, industry, non-governmental organizations, and private landowners to promote and enhance forest management on a landscape scale through collaborative projects. The current partnerships have opened regular conversations to address issues and management. Continuing these partnerships will lend itself to opportunities to work collaboratively on future issues.
9. Outreach: Promote forest management through RCF's website & public workshops held throughout the state. Workshops and seminars should teach communities and landowners about proper forest management and highlighting the benefits of management practices. Workshops specifically focused on urban issues, such as pruning techniques for healthy and safe trees in yards, how to get the most benefits out of urban trees, or where to plant to save energy will benefit the urban forest. Use the RCF website and social media to keep information easily accessible. Promote forest management, protecting water quality, windbreak installation and renovation through workshops, division website, and social media.
10. Training: Provide forest insect and disease training, at least bi-annually, or as needed when new forest health concerns arise. Provide continuing education opportunities so personnel can obtain and maintain licenses and certifications such as Certified Forester, Certified Arborist, Certified Pesticide Applicator,

licensed drone operator, ATV/UTV operator and instructor, Crop Advisor, Tree Farm Inspector and Inspector Trainer.

11. Conservation District Education: Inform and "re-educate" conservation districts regarding the Coordinated Plan for Natural Resources Conservation and how to use this plan to help identify and address larger scale natural resources needs.
12. Tools for Districts: Provide district employees and supervisors with training to understand:
    - Applicable state laws pertaining to natural resources (soil erosion and sediment reduction laws);
    - Payroll and taxes;
    - The accounting manual: and
    - The roles and responsibility of conservation districts.
13. Assistance: Assist the State Conservation Commission to identify:
    - The needs of conservation districts;
    - New practices needed to address natural resource issues; and
    - Training to new Conservation Commissioners regarding conservation districts and natural resource issues within South Dakota.

5.0 USFS State & Private Forestry National Priorities and Objectives*

1. Conserve Working Forest Landscapes

1.1 Identify and conserve high priority forest ecosystems and landscapes

1.2 Actively and sustainably manage forests

2. Protect Forests from Harm

2.1. Restore fire-adapted lands and reduce risk of wildfire impacts

2.2. Identify, manage, and reduce threats to forest and ecosystem health

3. Enhance Public Benefits from Trees and Forests

3.1. Protect and enhance water quality and quantity

3.2. Improve air quality and conserve energy

3.3. Assist communities in planning for and reducing forest health risks

3.4. Maintain and enhance the economic benefits and values of trees and forests

3.5. Protect, conserve, and enhance wildlife and fish habitat

3.6. Connect people to trees and forests, and engage them in environmental stewardship activities

3.7. Manage trees and forests to mitigate and adapt to global climate change

* Approved by the S&PF Redesign Implementation Council and by NASF, Sept. 2008

5.1 USFS State & Private Forestry National Priorities and Objectives Crosswalk with South Dakota Programs and Projects

South Dakota Programs/Projects	**Conserve Working Forest Landscapes**		**Protect Forests from Harm**		**Enhance Public Benefits from Trees & Forests**						
	National Priority Objectives (Refer to the list on page 21)										
	1.1	**1.2**	**2.1**	**2.2**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**3.6**	**3.7**
1.1 Forest Health Program											
1.1.1 Trapping and monitoring		**X**		**X**			**X**				
1.1.2 Community Forestry Health Assistance				**X**	**X**	**X**	**X**	**X**	**X**	**X**	
1.1.3 Weekly Pest Updates and Pest Bulletins				**X**			**X**			**X**	
1.1.4 Forest Health Education Workshops		**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
1.1.5 Mountain Pine Beetle Initiatives	**X**	**X**	**X**	**X**	**X**		**X**	**X**		**X**	
1.2 Forest Stewardship Program											
1.2.1 Landowner Assistance	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**
1.2.2 Non-commercial Thinning Assistance		**X**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**
1.2.4 Tree Farm Program	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**
1.3 Agroforestry Assistance											

South Dakota Programs/Projects	**Conserve Working Forest Landscapes**		**Protect Forests from Harm**		**Enhance Public Benefits from Trees & Forests**						
	National Priority Objectives (Refer to the list on page 21)										
	1.1	**1.2**	**2.1**	**2.2**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**3.6**	**3.7**
1.3.1 NRCS Cooperative Work		**X**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**
1.3.2 Windbreak Condition Grant		**X**		**X**	**X**	**X**		**X**	**X**	**X**	
1.3.4 Collaborative Conservation Grant & Agreement (CCGA)		**X**		**X**	**X**	**X**		**X**	**X**	**X**	
1.3.5 Great Plains Initiative 2 (GPI2)	**X**			**X**			**X**	**X**			
1.4 Good Neighbor Authority (GNA)		**X**	**X**	**X**	**X**			**X**			**X**
1.5 Urban and Community Forestry Program											
1.5.1 Tree City USA Program						**X**	**X**	**X**		**X**	
1.5.2 Analyzing the Potential Impacts of EAB in South Dakota		**X**		**X**	**X**	**X**	**X**	**X**		**X**	
1.5.3 Forestry Work and Tribal Relations	**X**	**X**		**X**	**X**	**X**	**X**	**X**		**X**	**X**
1.5.4 Environmental Education through Project Learning Tree		**X**		**X**				**X**	**X**	**X**	**X**
1.6 Forest Legacy Program (FLP)											

South Dakota Programs/Projects	**Conserve Working Forest Landscapes**		**Protect Forests from Harm**		**Enhance Public Benefits from Trees & Forests**						
	National Priority Objectives (Refer to the list on page 21)										
	1.1	**1.2**	**2.1**	**2.2**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**3.6**	**3.7**
1.6.1 Blood Run, Spring Creek, and Vanderpan FLP projects	**X**	**X**		**X**	**X**			**X**	**X**	**X**	**X**
1.7 Natural Resource Conservation Program:		**X**			**X**	**X**		**X**	**X**	**X**	**X**
2.0 South Dakota Wildland Fire Division											
2.1 Fuels Mitigation			**X**	**X**			**X**	**X**			**X**
2.2 Fire Suppression			**X**	**X**			**X**	**X**			
2.3 Training			**X**				**X**			**X**	