

# ***Black Hills Resilient Forest Strategy***

December 8, 2017



Figure 1 – Open-grown pine of varied ages and emerging aspen, Black Hills area.

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## ***Mission***

***Take action to create forests resilient to changing conditions that promote long-term economic, social and ecologic sustainability on all lands in the Black Hills region.***

## Introduction

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Approximately fifty “Conservation Leaders” first convened in September 2010 to consider a coordinated approach to the mountain pine beetle (MPB) epidemic that was rapidly expanding across all lands in the Black Hills. They prepared in 2012, and revised on 10/17/14, the *Black Hills Regional Mountain Pine Beetle Strategy*. That revised strategy anticipated an end of the mountain pine beetle epidemic and need for subsequent forest restoration. On 10/7/15 the Conservation Leaders charged the MPB Working Group to prepare a new strategy to address post-beetle issues and create healthier, more resilient forest conditions for the long-term. This document is a result of WG diligence and Conservation Leader review and approval and is referred to as the *Black Hills Resilient Forest Strategy* (BHRFS). This strategy serves as an umbrella for broadly-based, collaborative and strategic actions addressing issues such as invasive species, fire risk and hazard, healthy productive forests, public safety and habitat diversity. “Resiliency” is defined as “... the capacity of a (plant) community or ecosystem to maintain or regain normal function and development following disturbance.”<sup>1</sup> Foremost, leaders do not want a repeat of wide-ranging, epidemic-level insect and fire problems that have plagued the Black Hills in recent decades.

The BHRFS is a five-year strategy that identifies responses to forest conditions brought on by the mountain pine beetle epidemic in Wyoming and South Dakota (~1997-2016)<sup>2</sup>. The epidemic left areas of increased fuel loading juxtaposed with high density stands in many places and prolific pine regeneration that increases potential for high severity wildfire. Additional impacts include increased noxious and invasive species, modified wildlife habitats, changed ecological process and function, and detrimental effects on people and communities. A response to these changing forest conditions requires a comprehensive and strategic approach that identifies goals and objectives, and prioritizes actions to create a forest that is more resilient to significant, damaging disturbances in the future. This Strategy supersedes the *Black Hills Regional Mountain Pine Beetle Strategy*, which expired at the end of the epidemic, but elements of which are retained in this resiliency strategy. This Strategy does not replace any applicable agency or entity direction or plans.

Land managers and invested citizens have an opportunity, through forest management action, to conserve forest resources and socio-economic values, including: watersheds, forest ecosystems, high-value and sensitive sites, public safety, state and local economies, recreation, wildlife, tourism, aesthetics, and wood fiber supply for communities and company’s dependent on forest resources.

In order to achieve more resilient forest conditions for the long-term across all ownerships in the Black Hills and Bear Lodge Mountains it is necessary for all stakeholders to commit, and remain committed to, a comprehensive management strategy.

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<sup>1</sup> Helms, John A. 1998. Dictionary of Forestry. Society of American Foresters, Washington, D.C.

<sup>2</sup> Schotzko, Kendra and Kurt Allen. Forest Health Evaluation, R2-17-01. “*Evaluation of Mountain Pine Beetle Activity on the Black Hills National Forest.*” December, 2016. US Forest Service, R2-Forest Health Service Center, Rapid City, SD.

## Background

### *Landownership*

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The greater Black Hills region comprises approximately 1.5 million forested acres of interspersed federal, state, and private lands according to the most recent Forest Inventory and Analysis data. The largest landownership is the Black Hills National Forest (BHNF) with 1.16 million acres of forested land, followed by private lands at 475,000 forested acres, State lands of Wyoming and South Dakota totaling 99,000 forested acres, and the Bureau of Land Management at 24,000 acres of forestland. Ponderosa pine is the dominant tree species throughout all ownerships.<sup>3</sup>

Ponderosa pine ecosystems are under a low to mixed fire severity regime. Fire return intervals range from 10-13 years in the southern Black Hills to 30-33 years in the northern Black Hills<sup>4</sup>. This fire regime created diverse forest stand structures, consisting of open stand conditions, resistant to major stand replacing disturbances.

The mountain pine beetle, *Dendroctonus ponderosae*, an insect native to the Black Hills, was first discovered in the early 1900s. Historically the MPB existed in the Black Hills at endemic levels, with periodic outbreaks coinciding with increased stand densities. Analyses of high resolution aerial photography taken since 2010 (7 years) found 130,705 acres of MPB mortality, not counting infested acreage that was treated. When combined with less precise maps sketched by observers in aircraft from 1996 – 2011, it is estimated that over the last 20 years about 450,000 acres have been affected to varying degrees by MPB in the Black Hills.



Figure 2 - Beetle killed trees, fuels, and emerging pine regeneration. (Thom, Bear Mtn. Rd. 2015)

### *Natural Resources Issues*

Forest Fuels and Threatened Communities – Across the Black Hills and Bear Lodge Mountains, it is estimated that approximately half of the forested lands are in a high to very high fire hazard condition. Fifty-six at-risk communities lie within or adjacent to the Black Hills area,<sup>5</sup> not including specific private community developments that may be within wildland-urban interface. Community wildfire protection plans have been prepared for most of the Black Hills area and guide fire hazard and preparedness actions at a local level.

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<sup>3</sup> USDA-Forest Service, Forest Inventory & Analysis. [www.fia.fs.fed.us](http://www.fia.fs.fed.us).

<sup>4</sup> Brown, Peter, 2003, PhD dissertation; and Brown, P. and C. Sieg, 1996. Fire History in Interior Ponderosa Pine Communities of the Black Hills, South Dakota, USA. *Int. J. Wildland Fire* 6(3): 97-105.

<sup>5</sup> <https://www.federalregister.gov/articles/2001/08/17/01-20592/urban-wildland-interface-communities-within-the-vicinity-of-federal-lands-that-are-at-high-risk-from> .

Invasive Plants – As the forested overstory has opened up due to mountain pine beetle mortality, wild and prescribed fire, timber harvest, and other disturbances, evidence shows that invasive plants (weeds) have increased markedly in recent years, particularly in 2015. Weeds threaten forage production (wildlife and livestock), native species, and ecosystem diversity. Increased collaborative efforts are needed to curb invasive weed populations.



Figure 3 - Leafy spurge in forested environment (Guffey, 2016)

Forest Transition – Much of the Black Hills forest is in transition to younger forest. As a result of insects, fire and silvicultural response, portions of the forest have shifted from overstocked mature trees, to more open-grown mature trees, often with a significant seedling or sapling understory. Beetle killed areas are regenerating prolifically, setting the stage for future stagnated forests susceptible to beetles and fire. Yet portions remain at high risk to MPB infestation (mature and overstocked). Overstory removals and thinning will be necessary over the coming decades. Entomologists observed that stands of mature trees can be susceptible to MPB attack at low densities if a substantial seedling and/or sapling component is present in those stands. This understory stand component has the ability to influence pheromone dispersal and negate the benefits of reducing overstory stocking levels.



Figure 4 - Pine seedlings among beetle-killed fuels. Bear Mountain Rd., BBNF. 2015

Most recently, Forest Inventory and Analysis (FIA) data<sup>6</sup> from 2015 indicates 95 percent of ponderosa pine forests in all of South Dakota have tree diameters between 5 and 40 inches. Large diameter (9+ inches) stands account for approximately two-thirds of total ponderosa pine acreage. Within only the Black Hills National Forest in SD and WY, open-mature (Structural Stage 4A) forest stands account for 54 percent of the suitable forested area. FIA data through 2016 for the BBNF indicates standing timber inventory on timberland has remained relatively unchanged through the recent MPB epidemic, moving from about 5.5 billion board feet (BBF) in 1999 to 5.4 BBF in 2016. FIA data collection is being intensified in 2017-18 to continue examining this issue.

### **Strategies**

There have been a number of strategies produced over the past decade in response to the MPB epidemic that plagued the west. Each utilizes the best available science and research in formulating their respective goals,

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<sup>6</sup> Forest inventory data available at: [www.fia.fs.fed.us](http://www.fia.fs.fed.us)

objectives, and actions. Descriptions and summaries of these strategies are found in the *Black Hills Regional Mountain Pine Beetle Strategy*. As stakeholders shift towards forest resiliency, the previously developed strategies form a strong base to build upon and will likely play a role in planning towards more resilient forests in the Black Hills.

On national forest system land, the Black Hills National Forest Plan (2006) provides objectives, standards and guidelines for habitat diversity, fire and insect mitigation, among other provisions. The Forest Service provided an agency-wide strategic framework in 2012 addressing a host of forest health issues: “*Increasing the Pace of Restoration and Job Creation on Our National Forests*” with a follow-up report: “*From Accelerating Restoration to Creating and Maintaining Resilient Landscapes and Communities Across the Nation*” (FS-1069, November 2015).

In response to the Federal Land Assistance, Management, and Enhancement Act of 2009 (FLAME Act), Congress mandated the development of a *National Cohesive Wildland Fire Management Strategy*. The Strategy was adopted in 2014 and includes four priorities: 1) safe and effective response to wildfires, 2) vegetation and fuels management to improve the resiliency of our forests and rangelands, 3) engaging homeowners and communities to act before wildfire strikes, and 4) preventing human-caused ignitions.<sup>7</sup>

In 2014, the States of South Dakota and Wyoming requested that the USDA Secretary of Agriculture designate 72 contiguous sixth-level hydrologic units within the Black Hills National Forest as landscape-scale insect and disease treatment areas. They were selected because of their declining health, are subject to insect or disease mortality, or have hazard trees that pose an imminent risk to public infrastructure, health, or safety. Such designation (not including Wilderness and Wilderness Study Areas) was approved by the Secretary in 2014.<sup>8</sup>

The Western Forestry Leadership Coalition has a six-point plan that encompasses the principles of this Black Hills Strategy: collaboration, capacity and funding, co-benefits in management actions, science, all-lands, and effective citizen engagement.<sup>9</sup>

### Current and Past Actions

During the mountain pine beetle epidemic, which began in 1997, there have been tremendous efforts to reduce beetle spread and minimize the effects. The most effective work was thinning through timber sales to improve tree spacing and remove infested trees, thus increasing forest resiliency. In addition, “direct suppression” of beetles was done to reduce beetle populations in specifically focused areas, particularly on or near private lands. From 2012 through 2017, conservation partners non-commercially treated nearly 1.3 million infested trees (direct control) on about 865,000 acres, harvested over 1.4 million infested trees and harvest/thinned 187,050 acres to increase resistance to insect and fires, and pre-commercially



Figure 5 – Stakeholders review forest management. Black Hills Experimental Forest, 2015.

<sup>7</sup> <https://www.forestsandrangelands.gov/strategy/documents/strategy/CSPPhaseIIINationalStrategyApr2014.pdf>

<sup>8</sup> Correspondence, Chief of the Forest Service, Washington, DC. May 20, 2014. Gov. Dauggard requested 1,004,126 acres and Gov. Meade requested 191,915 acres within and outside of the BBNF.

<sup>9</sup> <http://wflccenter.org/six-point-plan/>

thinned 79,340 acres to improve resiliency. A collaborative all-lands approach was critical in completing this work and meeting the MPB strategic objectives. A similar coordinated approach to creating resilient forests for the long-term is needed to avert future significant insect and wildfire problems.

Forest industry in the Black Hills is a major contributor to the economic and social fabric of local communities. The 25-35,000 acres of annual treatment completed by timber purchasers and contractors contributed, along with other factors, to substantially slowing the epidemic. With the ability to thin and treat only a portion of acres across the forest, it is important that these treatments are targeted to be as effective as possible.



Figure 6 – Forest industry is a prominent partner in meeting resilient forest objectives. (c)Karen Wattenmaker Photography

## Purpose

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The BHRFS is a comprehensive strategy that defines goals, objectives, and actions to collaboratively address forest health conditions across all ownerships in the Black Hills. It is expected, in this complex resource environment, that participants will use the best available science and the best decision support tools that are practical and available. While several variables exist such as funding at the local, state and federal levels, the intent is to create a strategic framework that is cost effective. Local industry is key to cost-effective implementation of forest practices. Key principles of this strategy:

- 1) Collaboration – Entities operate in partnership by coordinating policies and actions across all ownerships.
- 2) Relationships - Work and relationships today endure through continuing and future natural resource issues.
- 3) Action-oriented - Partners take actions necessary to move towards conditions conducive to resilient forests.
- 4) Adaptiveness - Actions apply the latest science and share experiences to improve outcomes and provide information for landowners and interested individuals about resource conditions and needs.
- 5) Leverage – Partners work together to increase financing and coordinate treatments.

## Goals, Objectives, Actions

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**Goal 1** – Create and maintain diverse forest conditions at stand and landscape levels.

Objective 1.1 – Increase diversity of tree age, size, and species, and reduce stand density where necessary to increase resistance to future MPB infestations and high severity wildfire.

Action 1.1.1 – Use mechanical, prescribed fire or other methods to reduce seedling, sapling and pole (<5" dbh) tree density on up to about 50,000 acres annually across all ownerships. Ongoing.

Action 1.1.2 – Strive to commercially harvest 35-50,000 acres annually under management/stewardship plans or prescriptions that foster resilient, diverse forests.

Action 1.1.3 – Encourage increased acreage under stewardship plans to promote diverse forest conditions. Complete an estimated 15+ new plans and 15+ inspections annually (both States), commensurate with State Forest Action Plans and Tree Farm® strategies.

Action 1.1.4 – Monitor MPB and other insect and disease conditions and perform sanitation and suppression treatments where needed at an individual tree and a landscape level, particularly focused on high density stands. Ongoing.

Objective 1.2 - Implement actions to restore and conserve areas subjected to ecosystem disturbance.

Action 1.2.1 – Strive to treat noxious and invasive species across an estimated 50,000 acres annually across all ownerships in accord with a periodic action plan prepared by weed management partners. Annually.

Action 1.2.2 - Minimize potential impacts of non-native invasive species by seeding disturbed areas with native or naturalized species as soon as immediately practicable.



Figure 7 – Ponderosa pine, varied sizes, ages, spacing. (B. Cook, BHNF)

Action 1.2.3 - Seek to reforest areas of disturbance, planting tree seedlings in areas previously forested to the maximum extent possible, targeting areas suitable for future management.

Action 1.2.4 – Implement management actions to reduce the effect of significant insect, fire, and invasive species disturbances on special status species and habitats such as research natural areas and botanical areas. Ongoing

Objective 1.3 - Maintain water quality in forest and rangeland watersheds.

Action 1.3.1 - Use Best Management Practices to protect watersheds during treatments. Ongoing

Action 1.3.2 - Monitor research on watershed effects caused by insects (MPB), fire, and other disturbances. Annually.

**Goal 2** – Strive to protect people and communities from hazards created by standing dead trees and increased hazardous fuels.

Objective 2.1 – Reduce hazard of falling trees in forested environments where people, property and forests intermix.

Action 2.1.1 - Treat trees whose stability has been compromised by insects and pathogens along the highest priority roads, emergency routes, trails, utility lines, recreation areas and facilities. Ongoing

Action 2.1.2 - Develop and implement means to inform the public of falling tree hazards in untreated areas or sites. Ongoing

Objective 2.2 - Decrease risk of moderate to high severity fire associated with elevated fuel loadings following beetle infestation and other disturbance, particularly in the Wildland Urban Interface (WUI).

Action 2.2.1 - Develop an integrated fuel strategy among partners using the best available science and technology to create a discontinuous fuel mosaic to reduce the spread of wildfires across all lands. Forest Service to convene partners, including VFD and timber industry representation, and complete in 2018.

Action 2.2.2 – Strive to reduce fire hazard on 50,000 acres annually across all ownerships, through timber harvest, non-commercial treatments and prescribed fire. Strive to reduce surface fuels resulting from MPB epidemic, while protecting remaining live trees.

Action 2.2.3 – Reduce future fire hazard on wildfire acreage by removing damaged timber where feasible using all available policy tools. Plan and prepare in advance due to short merchantability periods. When needed.

Action 2.2.4 – Provide information and encourage private landowners and homeowners to implement fire-adapted community principles. Work to establish two (2) new *Firewise*, or equivalent, communities annually.

**Goal 3** – Maintain current and future forest products capacity needed to cost-effectively create resilient forests and support local communities and economies.

Objective 3.1 – Retain current forest products companies in the Black Hills, while exploring additional new companies and products.

Action 3.1.1 - Utilize timber sales to reduce insect and fire hazard on federal, state and private lands based on a periodic action plan. Ongoing

Action 3.1.2 - Provide a means of communication regarding harvesting activities between the BHNF, BLM, states, counties and current/potential purchasers. Short term

Action 3.1.3 – To maintain current forest industry capacity and to meet forested land management objectives implement timber sales on a combination of all ownerships totaling at least 240,000 ccf sawtimber annually. Ongoing

Action 3.1.4 – In order to achieve ecosystem services and economic and societal benefits, promote awareness and explore all options to increase use of woody material that is currently being under-utilized On-going

**Goal 4** – Promote collaboration, communication, relationships and science needed to develop resilient forests.

Objective 4.1 - Share information and seek solutions about the use of human, financial, and physical resources among participating entities to improve resilient forests, particularly in reference to State Forest Action Plans

Action 4.1.1 – Seek traditional and non-traditional federal, state, local and private funding in addition to current levels. Ongoing

Action 4.1.2 – Identify and leverage human and physical resources to accomplish goals and objectives. Ongoing



Action 4.1.3 – Enlist relevant and proven science to inform and implement land management actions. Semi-annually.

Action 4.1.4 – Seek techniques and methods to engage private landowners in managing their lands, e.g. “Tools for Engaging Landowners Effectively” Workshop (to equip resource managers for engaging landowners...).

Objective 4.2 - Establish and maintain regular and timely communication between interested local, state, private, tribal and federal entities.

Action 4.2.1 – Continue the “*Conservation Leader*” group of elected officials, upper level agency administrators, industry officials, and key public entities to provide policy guidance and communication when needed to monitor and implement the goals of this Strategy.

Action 4.2.2 – Create and maintain a **Resilient Forest Partnership (BHRFP)** of interested parties to implement activities outlined in this strategy. 2018 and on-going.

Action 4.2.3 – Create and maintain a **Black Hills Invasive Plant Partnership (BHIPP)** to coordinate weed treatment, education, and to consider and adopt pertinent science.

Action 4.2.4 Retain a Coordinator (for the partnerships), under the direction of the *Conservation Leaders*, to serve as an information hub and facilitator for agencies, organizations and other stakeholders. The Coordinator will assist in developing cooperative efforts whenever possible and with respect to each entity’s policies, goals and objectives. Early 2018 and thereafter.

Action 4.2.5 – Develop a communication plan including education and public outreach regarding the issues, opportunities, resources risks and other information pertinent to creating and retaining resilient forests. Such communication plan may include social media or web-based approaches. Ongoing

Action 4.2.6 – Schedule *Conservation Leader* meetings to address natural resource concerns and further facilitate communication between affected parties including SD and WY elected officials. Annually or more frequently as needed.

Objective 4.3 – Create and review an action plans for the purpose of guiding forest resiliency efforts.

Action 4.3.1 – The BHRFP will prepare an annual Action Plan identifying work needed to create and retain resilient forests. Ongoing

Action 4.3.2 –The *BH Resilient Forest Partnership* and *BH Invasive Plant Partnership*, and others subsequently formed, will coordinate and report annually to the National Forest Advisory Board and other interested entities on the progress of goals and objectives. Ongoing

## Authorities and Limitations

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The *Black Hills Resilient Forest Strategy* has no legal authority and is not recognized as a corporate entity. Individual partners operate within their separate management plans and objectives and are not bound by any decision of the BHRFS to expend financial resources, exceed legal limitations imposed by applicable statutes, or limitations imposed by individual governing boards.

## Adoption

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We the undersigned, in the interest of the resiliency of lands in the Black Hills, the protection of natural resource-dependent communities, and in review and understanding of the considerations put forward by this document agree to voluntarily participate, in good faith, in the *Black Hills Resilient Forest Strategy*.

Furthermore, we commit to working with one another in the spirit of cooperation and collaboration in mutual respect to each other to advance the goals set forth in the strategy.

This strategy was prepared by a committee of the Black Hill Regional Mountain Pine Beetle Working Group, in cooperation with other potential stakeholders, and discussed in draft form at a meeting of *Conservation Leaders* on January 27, 2017 and approved on December 8, 2017.

The following Conservation Leaders endorsed the *Black Hills Resilient Forest Strategy* as of the date indicated:

<u>SIGNATORY</u>	<u>ORGANIZATION</u>	<u>DATE</u>
1.		
2.		
3.		
4.		
5.		