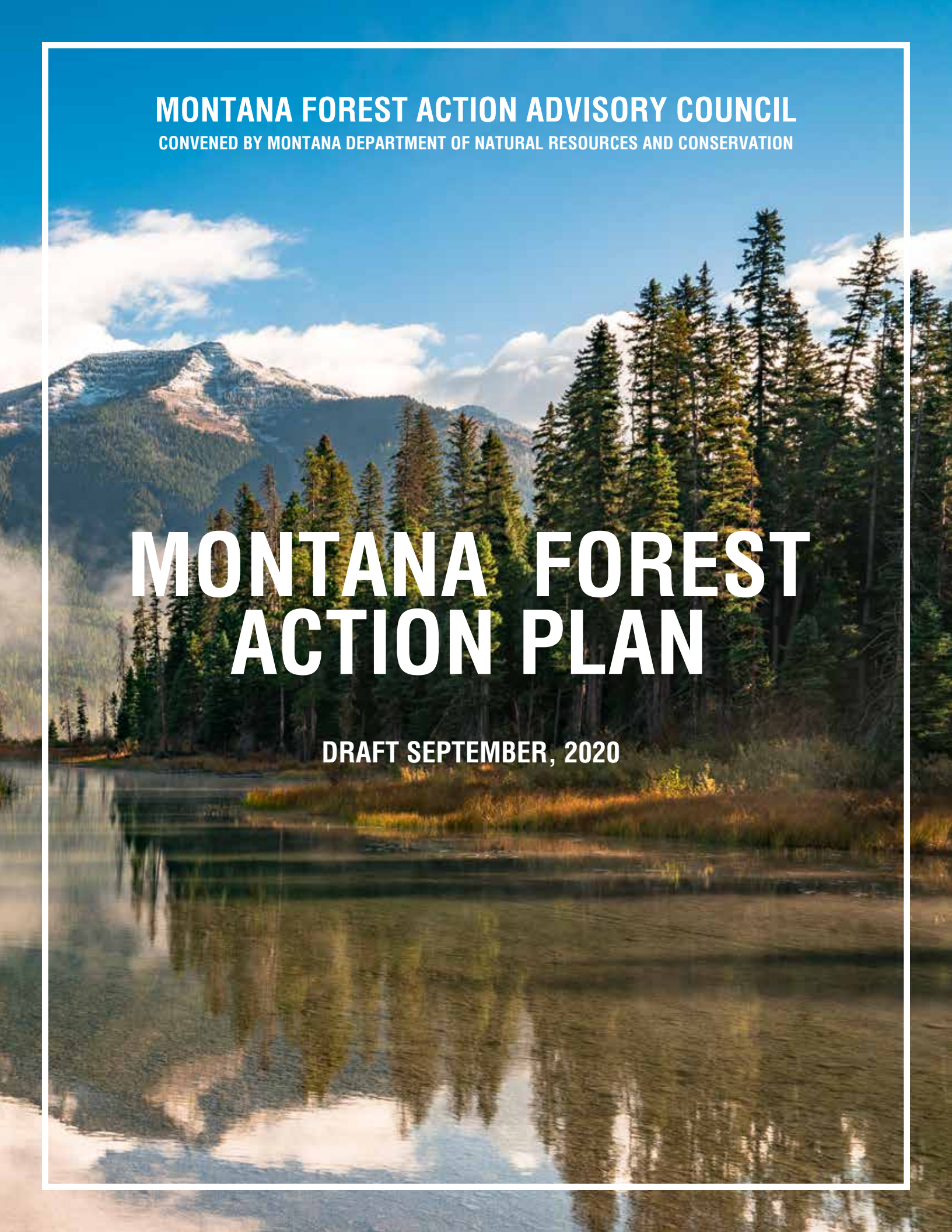

MONTANA FOREST ACTION ADVISORY COUNCIL

CONVENED BY MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

MONTANA FOREST ACTION PLAN

DRAFT SEPTEMBER, 2020

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LAND ACKNOWLEDGMENT

The Montana Forest Action Advisory Council acknowledges and honors that what we now refer to as the state of Montana is the traditional homeland of many indigenous peoples, both past and present (Figure 1). In order to best understand Montana's forests, we must understand how the presence of indigenous people has shaped and continues to shape the landscape we have the privilege to manage today.

Montana is home to eight federally recognized tribal nations, including the Confederated Salish and Kootenai Tribes of the Flathead Reservation, the Blackfeet Nation, the Chippewa Cree Tribe of Rocky Boy's Indian Reservation, the Assiniboine & Gros Ventre Tribes of Fort Belknap Indian Community, Fort Peck Assiniboine & Sioux Tribes, the Crow Nation, the Northern Cheyenne Tribe, and the Little Shell Tribe of Chippewa Indians. In addition to these nations, many tribes beyond the borders of Montana have claims to hunting, fishing, and cultural sites within the state. The Montana Forest Action Advisory Council recognizes this heritage and understands that we exist within a long history of cultural and indigenous stewardship practices. For more information on the history of these practices, please see ***Indigenous Peoples & Forests*** in the *Statewide Assessment of Forest Conditions*.

Figure 1. *The Tribal territories, as defined by the Fort Laramie Treaty of 1851* (Original data from University of Montana, replicated by DNRC, 2020).

MONTANA FOREST ACTION PLAN

Insects, disease, and fire
don't stop at the fence lines.
Neither should our management.

INTRODUCTION

From the mixed conifer forests of the west to the ponderosa pine and riparian cottonwood stands of the east, Montana's forested environments create extensive and diverse landscapes that benefit the state's citizens and communities. Whether it's the indigenous peoples who've inhabited this land since before recorded history or the generations of Montanans who've made their living off the land, Montanans have formed deep personal and cultural connections to the forest. Montanans and visitors continue to find important ways to connect with our forests, whether through outdoor recreation, protecting wild spaces and habitat for Montana's extensive biodiversity, supporting a wide array of wood products and services vital to a strong forest products economy, and enjoying the many benefits of clean air and water the forests provide.

For several generations, however, Montanans have been watching their forests change in unprecedented ways. In the early 1900's, people came to believe that wildfire was detrimental to the landscape, and practices were put in place to exclude fire from the environment. These management decisions, combined with past forest practices, have created forest conditions that have departed from historical conditions. Across many acres in certain forest types, forests are uncharacteristically dense, contain excessive fuel loads, and contain tree species that are less tolerant of wildfire (Keane et al., 2002). In certain forest types, the changes to forest structure have created forests that are less resilient to wildfire and more susceptible to uncharacteristic insect and disease outbreaks and climate change impacts (Halofsky et al., 2018). Over the past decade nearly half of Montana's forests have been impacted by insect and disease outbreaks, and the current pace and magnitude of climate change is expected to further impact forests across the state (Whitlock et al., 2017). These changes are compounding to increase risk of uncharacteristic wildfire, further exacerbated by the longer and more severe wildfire seasons and the increased development within or adjacent to fire-prone ecosystems (Calkin et al., 2013). The current conditions of our forests requires us to think strategically and apply the best available science to identify opportunities to improve forest health, reduce wildfire risk to communities, and prioritize actions to conserve wildlife, protect watersheds, build community resiliency, and maintain a strong and diverse recreation, wood products, and tourist economy.

Degraded forest conditions and wildfire risk don't stop at fence lines and neither should our management. Wildland firefighters have embraced a seamless approach in coordinating across state, local, tribal, and federal partners by embodying the saying that "no one cares what color the engine is," because at the end of the day, a safe and effective wildfire response requires that partners work together across land ownerships and missions. Forest managers need a similar approach when it comes to restoring forest health and reducing wildland fire risk, and need to expand partnerships to include an array of partners, both traditional and non-traditional, who have a stake in the collective well-being of Montana's forests.

Desiring a seamless and coordinated cross-boundary approach, Governor Bullock issued a call to action to collaboratively address the most pressing concerns of forest health and wildfire risk across Montana. In 2018, he released his initiative, Forests in Focus 2.0: A Cross-Boundary Collaborative Approach (FiF 2.0). The initiative emphasized better planning, a well-organized statewide collaborative effort, scaling partnerships down to the local level, replicating those partnerships on a community by community basis, and targeting investments that bring capacity where we most needed it to get work done.

As a part of FiF 2.0, Governor Bullock initiated the formation of the Montana Forest Action Advisory Council (MFAAC) in May of 2019, bringing together a group of forest management experts and collaborators to take an all-lands, all-hands approach to address the most pressing issues facing Montana's forests. With the Montana Department of Natural Resources and Conservation (DNRC) as the principal convener, MFAAC's objectives were to revise the State Forest Action Plan to:

1. Create a shared understanding of the conditions of all forested lands in the state of Montana;
2. Identify priority areas to address forest health and wildfire risk based on those conditions; and
3. Recommend strategies to create an efficient, effective, and comprehensive response to those conditions primarily, but not exclusively, within those priority areas.

Most importantly, MFAAC was tasked with rethinking how to work together across real and perceived boundaries while amplifying collaboration, using the best available science, data, and information, and sustaining cross-boundary efforts into the future.

The 2020 revision of the *Montana Forest Action Plan* serves as Montana's authoritative roadmap for addressing forest health and wildfire risk issues across all forested lands in the state. It is intended to catalyze better planning and coordination with numerous partners to achieve collective objectives at larger scales as a normal part of doing business. The timing of the *Montana Forest Action Plan* revision presents a unique opportunity for Montana to align with other coordinated calls to action, such as:

- The National Cohesive Wildland Fire Management Strategy;
- The USDA Forest Service's Toward Shared Stewardship: Across Landscapes strategy;
- USDA Natural Resource Conservation Service's Montana Focused Conservation; and
- Locally-driven collaboratives across Montana, many of whom are already engaged in cross-boundary work.

There is also an opportunity to use existing authorities and tools, such as Good Neighbor Authority (GNA), and to move ahead with climate adaptation strategies for forest management, which were identified in the recently completed Montana Climate Solutions Plan. Leaders are stepping forward throughout the state to answer this call to action and the *Montana Forest Action Plan* is meant to support this ongoing work and inspire others to join the effort.

WHAT ARE STATE FOREST ACTION PLANS?

Forest Action Plans originated with the passage of the 2008 Farm Bill, which required states and territories to develop an assessment of the conditions of the forests within their states every ten years, regardless of ownership, and develop strategies to address issues that ensure alignment with the USDA Forest Service State and Private Forestry program's national priorities, which are:

- Conserve working forest landscapes;
- Protect forests from harm; and
- Enhance public benefit from trees and forests.

States must complete these plans to maintain eligibility for State and Private Forestry program funding, but forest action plans offer states and territories the opportunity to communicate the conditions on forested lands within their state and to develop solutions for investing federal, state, local, and private resources where they can be deployed to help achieve national goals.

Through the 2010 Montana Forest Action Plan, the State received nearly $50 million (2010-2020) from the State and Private Forestry program. These funds were used to help conserve working landscapes, better protect forests from insects and disease, empower private landowners to manage their land, and ensure the health and vibrancy of the state's forests and urban forest ecosystems.

In seeking to expand beyond the original purpose and emphasis of Forest Action Plans, the 2020 revision of the Montana Forest Action Plan will provide a framework to build more coordination and cooperation at the statewide and local level. This Forest Action Plan emphasizes better planning, well-organized collaborative efforts, and scaling partnerships down to the local level on a community by community basis to bring capacity where it is needed most.

Annual funding provided by the USDA Forest Service's State and Private Forestry program is critical to maintaining DNRC's capacity to offer services to the people of Montana. Without these funds many of the programs would not be possible. As such, this plan was written with the intent of maintaining and strengthening Montana's eligibility for such funding opportunities.

A brief description of some of the programs reliant on these funds appears below. Additional information on each program is available in the *Statewide Assessment of Forest Conditions.*

Urban and Community Forestry (UCF) —The UCF Program brings awareness and focus to the trees within Montana's populated areas. The UCF Program reaches over half of Montana's population every year, with services to an average of 75 communities, and provides technical expertise, grants, and educational outreach.

Forest Stewardship—The Stewardship Program provides private and community forest owners with the resources they need to actively and sustainably manage their forests. Investment of grant money in Montana communities results in work to reduce wildfire risk and improve forest health on approximately 2,000 community-adjacent acres per year, and almost 1,000 landowners per year receive technical and educational assistance to meet their forest stewardship goals and objectives through this program.

Forest Pest Management—The Forest Pest Management Program provides assistance to non-federal landowners and resource managers to help with the prevention, identification, and management of forest insects and diseases. In addition to offering professional trainings and financial assistance, the program performs surveys of forest insects and disease across the state and publishes their finding annually.

Forest Products and Biomass — The Forest Products and Biomass Program provides technical assistance to support forest product businesses, including market development and innovation, and financial assistance for wood energy projects. The program supported the development of an advanced wood construction curriculum, which included the engineering and design of large-scale wood energy projects in the state, and recently launched a statewide branding campaign for Montana wood products.

National Fire Capacity (NFC) — Formerly known as State Fire Assistance, the NFC grant program helps support DNRC's statewide Fire Protection Program by increasing the capability and preparedness of Montana's wildland fire suppression forces, and by promoting resilient landscapes, fire adapted communities, and safe and effective wildfire response. This funding improves firefighter training (including leadership, aviation, chainsaw, structure ignition, and engine academies) and cultivates fire prevention and community wildfire adaptation programs. Funding from this program can also be used to modernize and upgrade mobile fire equipment to maintain our state and local government equipment cache and fleet of fire engines, water tenders, and support vehicles. A portion of this funding is released regionally through a competitive grant program to increase education and reduce hazardous fuel conditions in the WUI. Over the past ten years, Montana received more than $11 million in funding from NFC and an additional $15 million in WUI grants.

Rural Fire Capacity (RFC) — Formerly known as Volunteer Firefighter Assistance, the RFC grant program provides cost-share financial assistance to rural volunteer fire departments in communities of 10,000 persons or less for organizing, training, and equipping local firefighters. The program provides an excellent opportunity for qualifying rural fire departments to receive equipment, training, and supplies that otherwise may be inaccessible due to funding constraints. DNRC administers and awards these grants through a competitive process focusing on areas of greatest impact and need. Annually, DNRC has awarded grants to 65 rural fire departments on average, in amounts ranging from $1,000 to $13,000 each. These grants improve the effectiveness of fire protection in rural areas and complement other State-County Cooperative Fire Protection Programs across the state.

Federal Excess Personal Property (FEPP) – Through the FEPP program, DNRC is able to acquire vehicles and equipment on loan to state and county cooperators for the purpose of wildland and rural firefighting. DNRC has used the program since 1967 to offset costs (over $50 million) in supporting the department's fire program. These acquisitions have decreased in recent years with the increased use of the Department of Defense Fire Fighter Program, but FEPP is still a vital part of DNRC aviation operations and will continue to be used by the state.

Fire Fighter Program (FFP) – The Department of Defense FFP enables DNRC to re-purpose Department of Defense equipment for use in fire and emergency services. The program allows state, county, and emergency fire service organizations to acquire vehicles and equipment at a minimal cost. Of Montana's 56 counties, 54 have acquired vehicles or equipment, with an acquisition value of more than $96 million since Montana began participating in the program in 2006.

Montana Forest Legacy Program – The Montana Forest Legacy program has been in operation since 2000. The program is administered by the USDA Forest Service and managed by Montana Fish, Wildlife and Parks. The purpose of the program is to conserve high priority privately-owned forests with a focus on wildlife and aquatic habitats, sustainable timber production, drinking water, public recreation, and other values. Funding to Montana's program is provided through national competitive grants, and since the program's inception nearly 261,000 acres of Montana forests have been conserved. This program includes a separate planning document, the Montana Forest Legacy Assessment of Need, which is attached as an appendix to the *Montana Forest Action Plan.*

*This list represents a subset of funding used on forested lands across Montana. We recognize there are numerous programs and funding sources that have not been captured.

MONTANA FOREST ACTION ADVISORY COUNCIL

Through Executive Order 07-2019, Governor Bullock appointed 23 collaborators from across the state, representing a diversity of expertise, interests, and perspectives. MFAAC's membership includes representatives from federal, state, local, and tribal governments; industry partners; conservation organizations; collaborative and watershed groups; recreation and tourism entities; and other relevant partners who are actively involved in forestry issues. Through the process of collaboration, MFAAC achieved consensus-driven solutions to help amplify on-going work in the state and find more ways of working together across ownership boundaries and jurisdictions.

MFAAC addressed the following objectives set forth by Governor Bullock:

CREATE A SHARED UNDERSTANDING OF THE CONDITIONS OF ALL FORESTED LANDS IN THE STATE OF MONTANA.

- The *Statewide Assessment of Forest Conditions (Assessment)* provides an updated analysis of forest conditions, trends, threats, and opportunities across Montana's forested landscapes. The *Assessment* provides Montanans a deeper understanding of the conditions on all forested lands, utilizing the best available statewide data and science, and serves as an authoritative source of information on statewide forest conditions.
- The *Assessment* covers six main topics: Forest Health; Wildfire Risk; Working Forests and Economies; Biodiversity and Habitat Conservation; Human and Community Health; and Urban and Community Forestry. The *Assessment* represents the work of numerous interagency contributors and can be found as a stand-alone document on the *Montana Forest Action Plan* website. Data and information from the *Assessment* provided the foundation for the identification of *Priority Areas for Focused Attention*. Conditions, trends, threats, and opportunities from the *Assessment* are summarized in this document in *Major Findings and Recommendations*.
- Additionally, the *Assessment* includes other important sections that do not fall within the six major topics. These include climate change as it relates to Montana's forests, a brief history

of Indigenous peoples and forests, a breakdown of Montana forest ownership, and a short background on forest-based collaboration and collaborative capacity.

- To read the full *Assessment*, please see the stand-alone companion document *Statewide Assessment of Forest Conditions.*

IDENTIFY PRIORITY AREAS TO ADDRESS FOREST HEALTH AND WILDFIRE RISK BASED ON THOSE CONDITIONS.

- The *Priority Areas for Focused Attention* highlight places across Montana with significant forest health issues and elevated wildfire risk to communities and infrastructure. These areas were identified using a geospatial methodology and by incorporating data sets approved by MFAAC. The identified areas depict potential opportunities for cross-boundary and landscape-scale projects involving multiple partners and objectives. The *Priority Areas for Focused Attention* and associated data layers are available as a decision support tool on the *Montana Forest Action Plan* website.
- For more information on how *Priority Areas for Focused Attention* were identified, please refer to the section below. To read the full methodology, please see the *Statewide Assessment of Forest Conditions* and explore the *Priority Areas for Focused Attention* Interactive Dashboard.

RECOMMEND STRATEGIES TO CREATE AN EFFICIENT, EFFECTIVE, AND COMPREHENSIVE RESPONSE TO THOSE CONDITIONS PRIMARILY, BUT NOT EXCLUSIVELY, WITHIN THOSE PRIORITY AREAS.

- The *Montana Forest Action Plan* summarizes major findings from the *Assessment* and uses *Priority Areas for Focused Attention* to offer recommendations for improving forest health and reducing wildfire risk across all forested lands in Montana. For more information on goals, objectives, performance measures, and strategies associated with those recommendations, please refer to *Major Findings and Recommendations* sections.

To focus conversations and produce usable outputs, MFAAC kept itself anchored to the duties outlined in the Executive Order. Three of the most notable duties were:

- Prioritize and amplify collaborative efforts that bring together stakeholders representing diverse perspectives;
- Ensure the Montana Forest Action Plan does not counter or conflict with existing land management plans; and
- Assist in identifying priority landscapes for forest restoration and management action that lead to successful, coordinated projects that are shared across jurisdictions and constituencies.

For a comprehensive list of MFAAC duties please see the ***Montana Forest Action Advisory Council Executive Order.***

Throughout the process, the members of MFAAC came to the table with different values and viewpoints, but their work always centered around the common goals of keeping Montana's forests healthy and reducing wildfire risk to communities. The result is the *Montana Forest Action Plan*, which aims to amplify local, collaborative work in the *Priority Areas for Focused Attention,* while finding more ways of working across ownership boundaries and jurisdictions.

DEFINING FOREST HEALTH

MFAAC identified the need to provide a working description of forest health in order to be as clear as possible when communicating about Montana's forested lands. MFAAC collectively agreed upon the following:

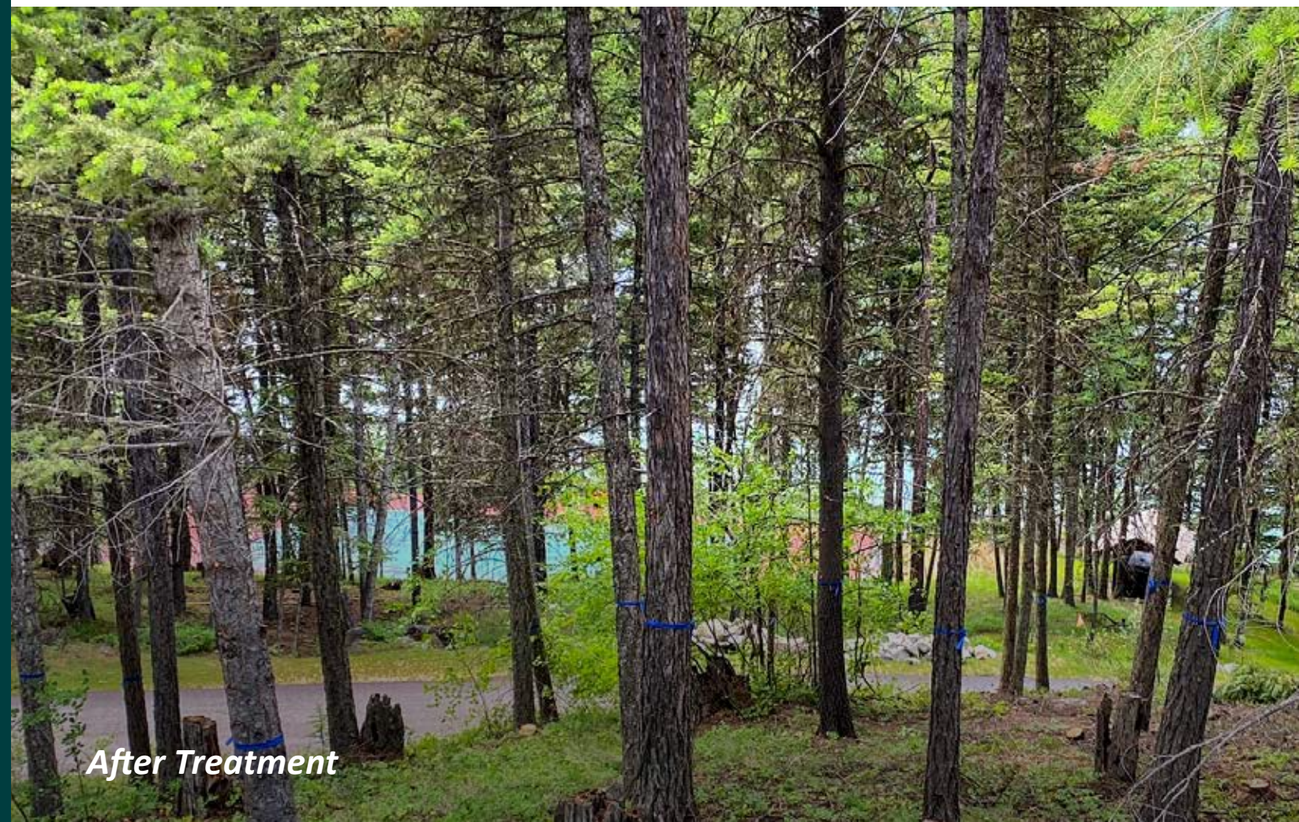
Montana has over 23 million acres of forested land occurring throughout most portions of the state, both within and outside of our communities, which are critical to maintaining excellent air quality, drinking water supply and other beneficial water uses, important wildlife and fisheries habitat for a diverse range of species, long-term storage of carbon and climate regulation, soil health and conservation, outstanding recreational and tourism opportunities, cultural heritage values, and a wide array of wood products and services vital to a strong forest products economy.

Over the past few decades, we have experienced increased debate over use, management, and protection of forest lands. These debates reflect the different values that individuals and groups place on forests and natural resources. Accordingly, we also have different perspectives on forest health that are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales. There is no single measure or correct set of metrics to evaluate the condition of our forests because every forest ecosystem type is characterized by different conditions. Any meaningful definition of forest health must incorporate the concept of resiliency: the capacity of an ecosystem to withstand and recover from disturbances imposed by natural environmental dynamics or human influence. It is with this in mind that the Montana Forest Action Advisory Council sets forth the following components of Forest Health rather than a single definition

The components of forest health at a landscape scale are recognized by the MFAAC to be:

- Growth, structure, composition, and function representative of historical and natural ranges of variability, disturbance regimes, and forest dynamics considering forest type under conditions of projected future climate change;
- Resilience to disturbance from fire, windthrow, insects and diseases, invasive species, drought, management, and impacts of climate change;
- Diversity of tree species and age classes that support a diverse array of plants, animals, and microbes; and
- Sustainable capacity to indefinitely and concurrently provide clean air and water, biodiversity, critical essential habitat, cultural values, long-term storage of carbon and climate regulation, recreation opportunities, aesthetics, and forest products.

Rather than defining forest health MFAAC elected to identify the components of forest health and for the remainder of the Forest Action Plan, when forest health is referenced, it is anchored in and embodied by this collectively agreed upon language drafted by MFAAC.



PRIORITY AREAS FOR FOCUSED ATTENTION

MFAAC was tasked with identifying "priority areas in need of active forest restoration with a particular focus on forest health and fire adaptation, community protection, industry retention and economic development, recreation and tourism, wildlife and aquatic habitat, watershed restoration and other areas as identified by the Council" (Executive Order No. 7-2019).

MFAAC used their expertise and knowledge, the information from the *Assessment*, and a data-informed geospatial model to determine the *Priority Areas for Focused Attention*. Prioritizing acres for active forest management represents a critical step towards implementing landscape-scale, cross-boundary forest restoration and management, and promotes focusing resources in areas with the greatest need.

To initiate the process of identifying *Priority Areas for Focused Attention*, MFAAC determined which forested acres would be considered in the analysis and the factors that were most important to accurately describe the conditions of Montana's forests, with a focus on forest health and wildfire risk.

MFAAC excluded approximately 7 million forested acres from analysis because of their established management plans and data limitations. These excluded areas that already have management goals and directives and include national parks, national monuments, national wildlife refuges, congressionally-designated wilderness areas, and wilderness study areas.

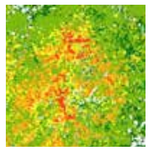
When selecting datasets to identify forest health and wildfire risk within areas that were not excluded from analysis, MFAAC developed the following selection criteria:

- Data must cover all forested lands in Montana, regardless of ownership.
- Data must be available at a statewide scale.
- Data must cover a timespan of at least 10 years.
- Data must have a consistent spatial resolution and free of data anomalies or abnormalities.
- Data must be publicly available and recognized as an authoritative dataset.
- Data must be digitized, preferably in raster or vector format.

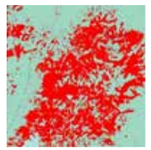
These criteria eliminated some datasets from consideration because they did not meet all of the requirements of the geospatial model. Specifically, a lack of adequate, statewide datasets increased the difficulty of modeling several forest health components and metrics as defined by MFAAC. Ultimately, three insect and disease datasets were selected because they met all of the criteria and could be assessed quantitatively. While a healthy forest does experience some degree of insect and disease activity, extensive disease outbreaks can indicate underlying forest health issues, while reducing a forest's intrinsic value and social, economic, and recreational benefits. For these reasons, insect and disease datasets were used as a proxy for assessing forest health. Although limiting, using insect and disease datasets as a proxy for forest health represents the best available data covering all forested lands in Montana.

Following the selection criteria, MFAAC selected the following datasets to assess statewide forest health and wildland fire risk conditions across forested lands in Montana:

FOREST HEALTH DATA LAYERS



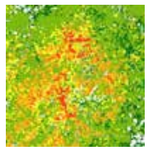
National Insect and Disease Risk: Produced by USDA Forest Service, this dataset predicts future forest loss to insects and disease across the state. It helps managers understand a forest stand's risk to impacts from insect and disease and depicts predicted basal area loss and through 2027. This is the only predictive dataset MFAAC opted to include in the analysis.



Insect and Disease Impact: Produced by USDA Forest Service, this dataset depicts forested areas that have experienced tree mortality since 2010. It includes impacts from Douglas-fir beetle, dwarf mistletoe, fir engraver beetle, mountain pine beetle, and root diseases.

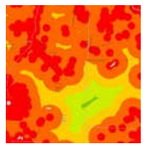
Western Spruce Budworm Recurrence: Produced by USDA Forest Service, this dataset identifies landscapes with chronic western spruce budworm infestations that were not accounted for the in the Insect and Disease Impact dataset.

WILDFIRE RISK DATA LAYERS

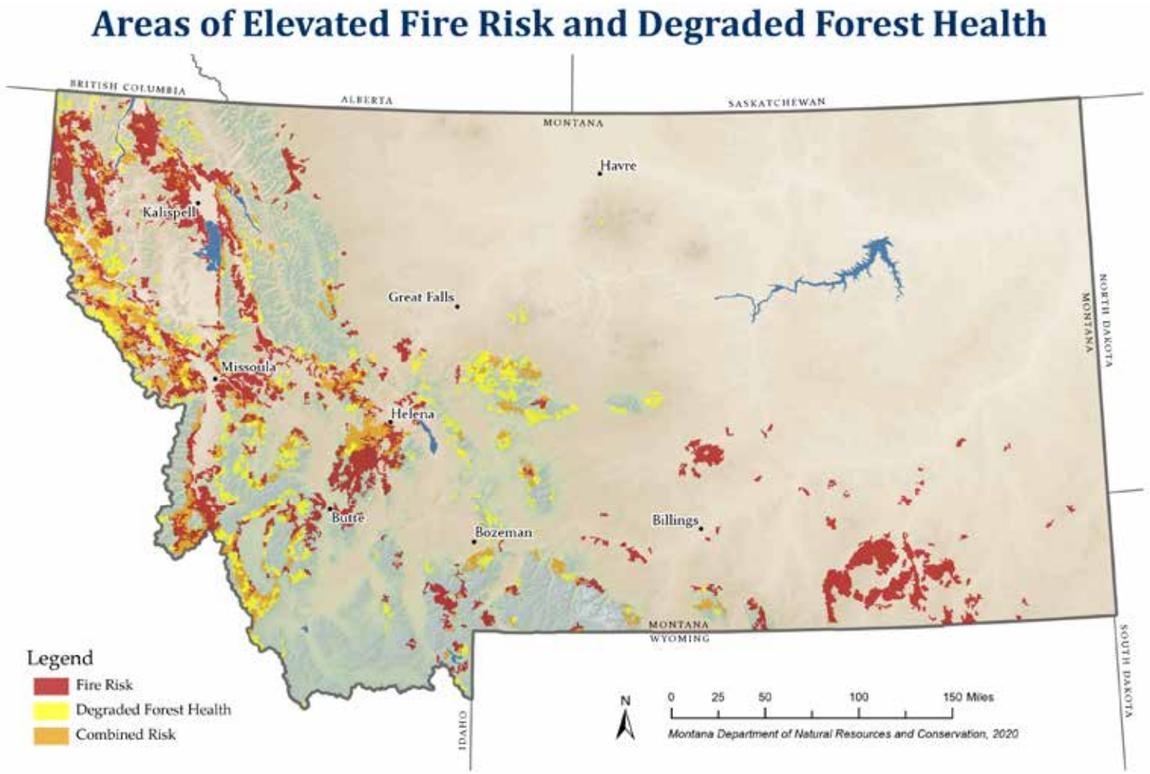


Wildfire Hazard Potential: Produced by the USDA Forest Service's Fire Modeling Institute, this dataset represents wildfire risk across the state and is the standard for fire risk mapping in the western United States. This data layer depicts the relative potential for high-intensity wildfires with torching, crowning, and other forms of extreme fire behavior that would prove difficult to contain.

Recent Fire History: Produced by DNRC, this dataset depicts the wildfires that have occurred in Montana since 2015. This dataset was used to augment the Wildfire Hazard Potential data layer, which did not account for any fires occurring after 2015.



Distance to WUI: Produced by DNRC, this dataset depicts all known structures in Montana with a weighted gradient from 0-10 miles to create risk zones extending out from the structure, with the highest weight applied to zones within 0-1/2 mile of a structure. The base map uses the federal definition of the Wildland Urban Interface (WUI).

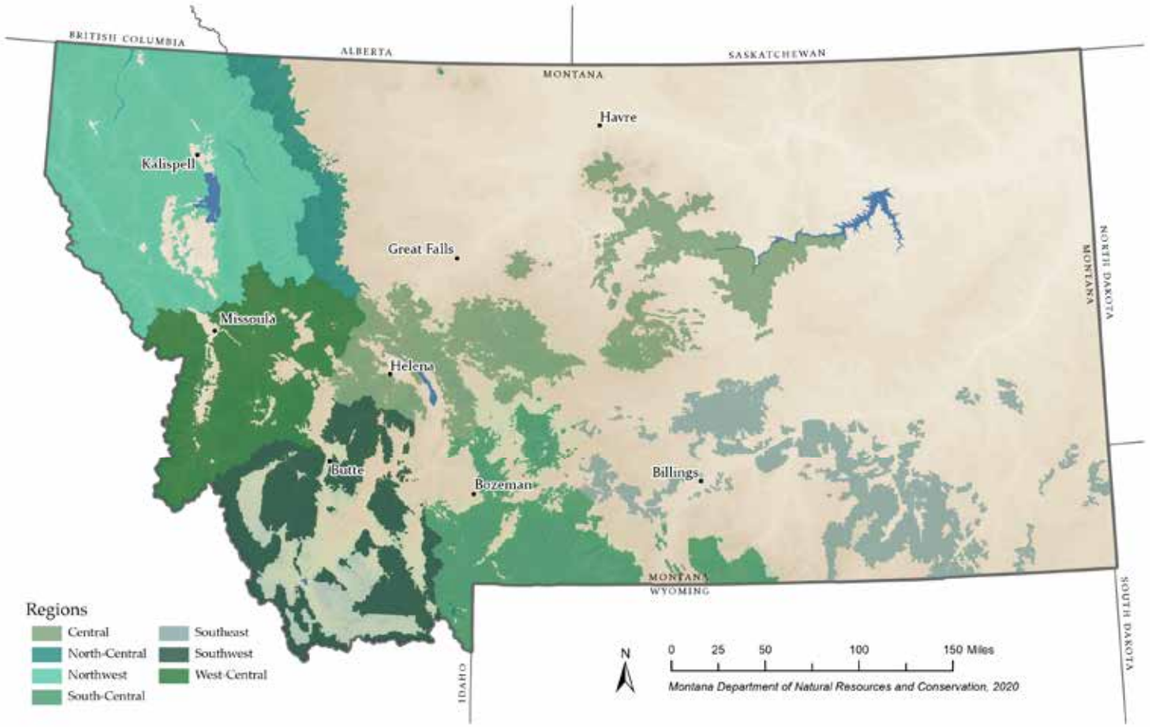


By overlaying these datasets, MFAAC identified approximately 9.1 million acres of forested land that were termed "Areas with Elevated Fire Risk and Degraded Forest Health." Standing at nearly one-third of the forested landscape in Montana, these areas represent portions of the landscape with significant forest health concerns and high wildfire risk to communities and infrastructure.

As modelling outputs were analyzed, it became evident that a few very high-risk areas in western Montana were driving the model, producing outputs that skewed priority areas more heavily in the western part of the state. Knowing that wildfire risk and forest health issues occur across Montana, and with the goal of having the MFAP serve the entire state, a normalization process was then used to ensure that areas are identified relative to fire risk and forest health within various regions throughout the state.

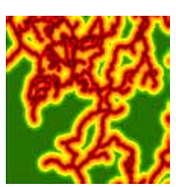
To account for local variations, regional disparities, and the relative importance of wildfire risk and insect pathogens, MFAAC divided the state into seven distinct forest regions based on the unique vegetation community, localized climate conditions, and topography (Arno, 1979). The model was normalized within each forest region to help better identify high-risk areas relative to the typical forest conditions found within that region. By normalizing the model output, the high-risk areas in eastern Montana were able to be identified and the areas in western Montana were further refined.

Montana Forest Regions

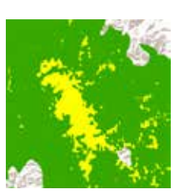


Given that the Areas with Elevated Fire Risk and Degraded Forest Health represented almost a third of the forested landscape in the state, MFAAC used additional datasets to help further refine the model to identify a more realistic set of lands for agencies and landowners to prioritize for restoration. MFAAC selected two additional datasets:

ADDITIONAL DATA SETS



Road Density: Maintained by DNRC, this dataset measures landscape access and includes all maintained roads in the state of Montana with buffers extending out from roads, uses a weighted gradient from 0-5 miles, with the highest weight being applied within 0-1/4 mile of a road. Inclusion of this dataset identified and increased the weight of lands that are more readily accessible.



Vegetation Type: Produced by USDA Forest Service, this dataset depicts forest types across Montana and was used to identify and increase the weight of forest types commonly associated with lower elevations.

Using these two additional datasets, the model is more likely to identify high-risk areas near existing road infrastructure and in forests more commonly associated with lower elevations. The priority areas thus represent forests with heightened wildfire risk and degraded forest health conditions within close proximity to our communities and infrastructure.

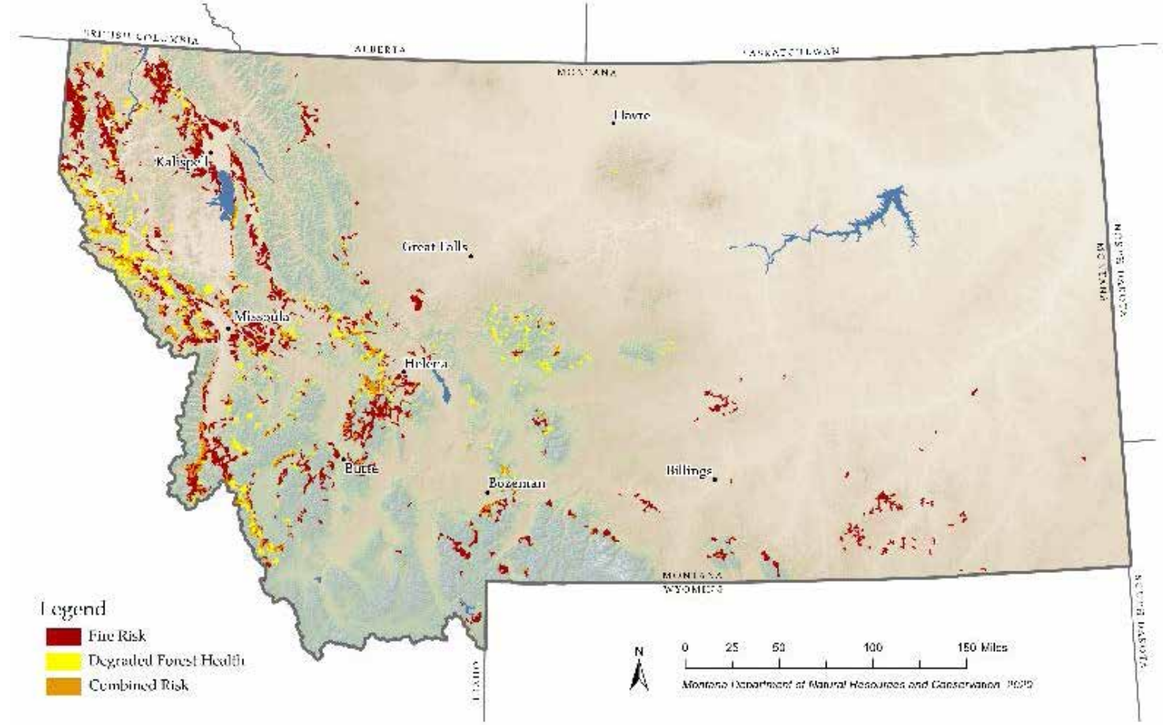
Through the refinement and redesign of the model, MFAAC identified 3.8 million acres of forested land in greatest need of attention, including those most conducive to landscape-scale, cross-boundary forest restoration and management activities. Because these areas transcend ownership boundaries and different use types, these challenges must be addressed collectively rather than individually.

To clarify the intent of the identified priority areas, MFAAC elected to call them "*Priority Areas for Focused Attention*." This nomenclature signals that these areas need further attention and consideration from local land managers, collaboratives, and stakeholders.

The goal is that the *Priority Areas for Focused Attention* can focus discussions to help initiate work in the most critical areas at an effective scale.

The *Priority Areas for Focused Attention* represent 3.8 million acres of forested land in Montana, notably this includes approximately 500,000 acres in the WUI and 123,000 acres in drinking water source watersheds. In these areas, designation does not guarantee action or funding for a project; rather, it demonstrates that there are significant forest health or wildfire risk issues that warrant prioritization of forest restoration funds in order to most effectively mitigate risk. Local land managers can overlay modeling outputs from this plan on their own geospatial datasets to help leverage resources and staff to meaningfully address some of the most pressing concerns facing forested landscapes. By using data that covers all land ownerships within the state, the *Priority Areas for Focused Attention* are meant to promote integrated restoration of forest and watershed conditions across ownerships.

Priority Areas for Focused Attention



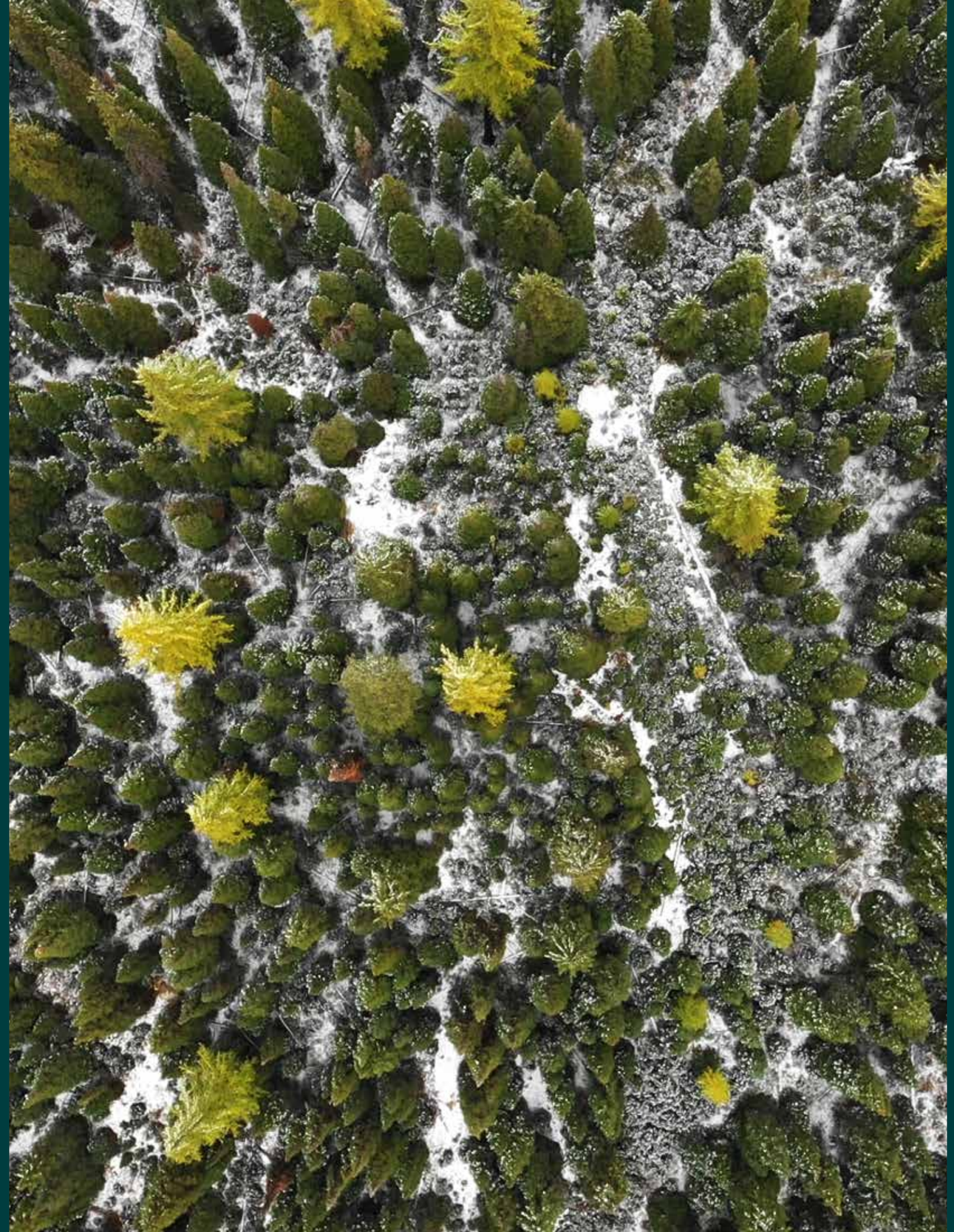
MONTANA'S FORESTS BY THE NUMBERS:

Wildfire (DNRC, 2020):

- 8,512,176 acres with 'Very High' or 'High' wildfire risk
- 1,614,750 acres burned from 2015 – 2020 (as of August 24, 2020)
- 2,741,098 acres burned in from 2010 – 2020 (as of August 24, 2020)
- 5,953,055 acres of forest exist within ½ mile of the WUI

Insects and Disease (NIDRHM, 2020):

- 1,639,366 acres impacted by Western Spruce Budworm
- 12,083,693 acres impacted by Pine Beetles during the previous outbreak (2006-2015)
- 7,609,567 acres at High to Moderate risk of insect and disease outbreak in the next 10 years
- 5,328,456 acres impacted by Douglas-fir beetle, dwarf mistletoe, fir engraver beetle, mountain pine beetle, and root diseases since 2010



DECISION SUPPORT TOOLS

***Priority Areas for Focused Attention* Interactive Dashboard** – As part of the Montana Forest Action Plan development, DNRC developed an interactive dashboard to display the *Priority Areas for Focused Attention*. The online dashboard includes a wealth of information, ranging from the data sets that were used in the development of the model to the priority area polygons. All polygons are interactive and display information that provide a better understanding of the conditions in a particular area, management considerations, and additional context surrounding on why it was included as a *Priority Area for Focused Attention*.

Montana Wildfire Risk Assessment - The Montana Wildfire Risk Assessment (MWRA) is a quantitative analysis of the highly valued resources and assets across the state and their potential risk to wildfire. The MWRA analysis considers several different components, each resolved spatially across the state, including the likelihood of a fire burning, the intensity of a fire if one should occur, the exposure of resources and assets based on their locations, and the susceptibility of those resources and assets to wildfire. This foundational information and data about wildfire hazard and risk supports wildfire response, regional fuels management planning, and revisions to land and resource management plans. This high-resolution wildfire risk analysis will be used to refine the *Priority Areas for Focused Attention* and assist local land managers and decisions makers as they begin to sequence and prioritize their programs of work.

MAJOR FINDINGS AND RECOMMENDATIONS

Drawing from the information in the *Assessment* and the data derived from the *Priority Areas for Focused Attention*, MFAAC identified a set of goals and suggested implementation strategies for each of the major topic areas listed: Forest Health; Wildfire Risk; Working Forests and Economies; Biodiversity and Habitat Conservation; Human and Community Health; and Urban and Community Forestry.

These strategies and recommendations are intended to facilitate cooperation and coordination amongst land managers, governments, forest owners, and other partners to improve forest health, reduce wildfire risk, support biodiversity and habitat conservation, improve human and community health, and promote the many benefits of urban and community forestry. These strategies and recommendations were largely driven by:

1. ***Resource and management needs;***
2. ***Opportunities identified within the Assessment;***
3. ***The experience and expertise of MFAAC members; and***
4. ***The need to address existing information and data gaps.***

How can partners use the Forest Action Plan?

The Montana Forest Action Plan sets a framework for coordinated, targeted actions and investments that will be critical to reducing wildfire risk and improving forest health conditions across the nearly 4 million acres identified to benefit from management actions. We hope that local land managers and collaboratives use the Montana Forest Action Plan to refine their analyses and start a dialogue about how to leverage resources and staff to meaningfully address the most pressing concerns facing our forests. The Montana Forest Action Plan will help land managers and local decisionmakers sequence programs of work and collaborate across jurisdictional boundaries to address wildfire risk and forest health issues while ensuring the safety and resilience of our communities and infrastructure.

FOREST HEALTH

Nearly one-quarter of Montana is covered by forested lands, ranging from mixed conifer stands in the west to ponderosa pine and riparian cottonwood stands in the east. Climate change and management decisions over the last 100 years have altered the structure and composition of many of Montana's forests, creating conditions in certain forest types that represent a major departure from how forests evolved over time. Large-scale fire exclusion, past harvest practices, and the lack of landscape-scale management, in some forest types, have altered the species distribution and forest stand types (Naficy et al., 2010). Current data shows that over 60% of Montana's forests are dominated by shade tolerant species and, in some areas, they have tripled their extent over the past century (Steinberg, 2002). Throughout the state in many forest types, shade-tolerant trees are outcompeting species that rely on periodic disturbances from fire (*e.g. western larch, ponderosa pine, lodgepole pine;* Keane et al., 2002). The absence of fire and related shift in species composition has created forests that are uncharacteristically dense and lack the diversity of age classes typical of a fire-adapted ecosystem (Hessburg et al., 2015; Berkey et al., *In press*). Additionally, conifer expansion is a common and growing threat across the state's grasslands, although comprehensive data on the current extent and magnitude does not exist.

Species shifts, in combination with stressors from climate change, have increased the occurrence of uncharacteristic levels of disturbance from wildfire, insects, and diseases (Halofsky et al., 2018). Such disturbances have had profound effects on the forest, in some cases altering soils and vegetation for decades to come. Over the past 10 years alone, insect and disease outbreaks have occurred on nearly half of the 23 million acres of forested land in the state. Impacts from insects and diseases are a natural part of forest succession and are not inherently negative, however the effects change when the populations reach outbreak levels. While some outbreaks minimally or temporarily damage trees, bark beetles and root diseases have had a more lasting effect. . The mapped extent of the recent mountain pine beetle outbreak in Montana (1999-2015) covered 6 million acres. Some of these areas were minimally impacted with only sporadic tree mortality, while other areas were severely affected and experienced widespread mortality from the beetles. Root diseases are often overlooked when discussing forest conditions but cause significant tree decline and mortality. The main root diseases impacting Montana

forests are Armillaria root disease, Heterobasidion root disease, tomentosus root rot, laminated root rot, and schweinitzii root and butt rot. More than 5.7 million acres across Montana and Idaho are currently infested with one or more root diseases, leading to an estimated loss of over 166 million cubic feet of timber per year (USDA, 2016). These diseases are expected to continually spread into susceptible forest stands.

Climate scientists project that increasing temperatures and changing precipitation patterns will increase tree mortality and negatively affect forest establishment, regeneration, growth, and productivity (Hankin et al., 2019; Davis et al., 2019). Additionally, the distribution and extent of forests will change over time. Some tree species will expand their geographic ranges while others will contract, and some models predict an overall loss of forested landscapes throughout the state (Keane et al., 2018; Whitlock et al., 2017). Climate change will also continue to exacerbate the spread of invasive species, threatening increased loss of habitat and ecosystem services. The annual mortality of forests has outpaced annual growth due to the combined effects of climate change, species shifts, fire exclusion, insects and diseases, invasive species, and a lack of active forest management (USDA FS, 2019).

Currently, the scale of the forest health issues far exceeds management capacity to help restore forests to be more resilient to wildfire, insects, disease, and a changing climate. Based on estimates from several forest management agencies, fewer than 100,000 forested acres are treated annually with mechanized means or prescribed fire. Management activities are rarely coordinated across jurisdictional boundaries to address common issues, and although recent initiatives and authorities help facilitate better planning and management, there are still barriers or gaps in agencies' ability to employ those tools. More can be done to support formal coordination at the local level to ensure that interagency and cross-boundary work becomes a normal part of managing our forests.

Going forward, active forest management and restoration (including commercial harvest, thinning, hazardous fuels reduction, prescribed fire, and wildfire managed for resource benefit) has a role in restoring forest conditions that are more resilient to extreme wildfire, insects and diseases, and climate change. It will require coordination, prioritizing collective work, and using innovative approaches and ideas to improve Montana's forests.

RECOMMENDATIONS — GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Improve forest resilience to disturbance from fire, windthrow, insects and diseases, drought, invasive species, human use, and climate change through management that ensures forests provide clean water, wildlife habitat and biodiversity, local economic and recreation opportunities, aesthetics, and other benefits for current and future generations of Montanans.

Strategies to achieve this goal include:

INCREASE FOREST RESILIENCE TO WILDFIRE, WINDTHROW, INSECTS AND DISEASE, DROUGHT, INVASIVE SPECIES, AND CLIMATE CHANGE.

- Prioritize lands within *Priority Areas for Focused Attention* when planning forest restoration projects.
- Invest in expanding agency capacity to implement a variety of treatment types, including mechanical treatment and prescribed fire, that increases the pace and scale of restoration treatments in *Priority Areas for Focused Attention*.
- Support projects that ensure forest growth, structure, composition, and function are representative of historical variability, disturbance regimes and projected future climate change, considering forest type.
- Better serve Indian Country by engaging tribes in Montana in identifying programs of work that address forest health and wildfire risk issues in and around tribal communities.
- Work collaboratively with all forest owners, land managers, and communities to implement management activities that maximize ecosystem service benefits.
- Support state and federal programs that assist private landowners in managing their forested lands and expand the use of cost-share programs and grants to improve forest health.
- Develop a statewide inventory of forest conditions, pests and root diseases, response to natural and human disturbances, that improves our ability to track and model forest health conditions overtime.
    - Specifically target at-risk tree species with potential for threatened and endangered listing such as limber and white bark pine.
    - Support and expand funding for ongoing applied science efforts by state agencies, universities, and others including citizen scientists to improve detection and prevention of invasive species that are tailored to geographic needs and conditions.
- Work with the Montana Legislature to explore opportunities to fund long-term monitoring and management of invasive species across ownerships and jurisdictions.

INCREASE THE UNDERSTANDING AND UTILIZATION OF TOOLS AND AUTHORITIES THAT FACILITATE CROSS-BOUNDARY WORK AND BUILD OUR COLLECTIVE CAPACITY TO ACCOMPLISH MORE WORK.

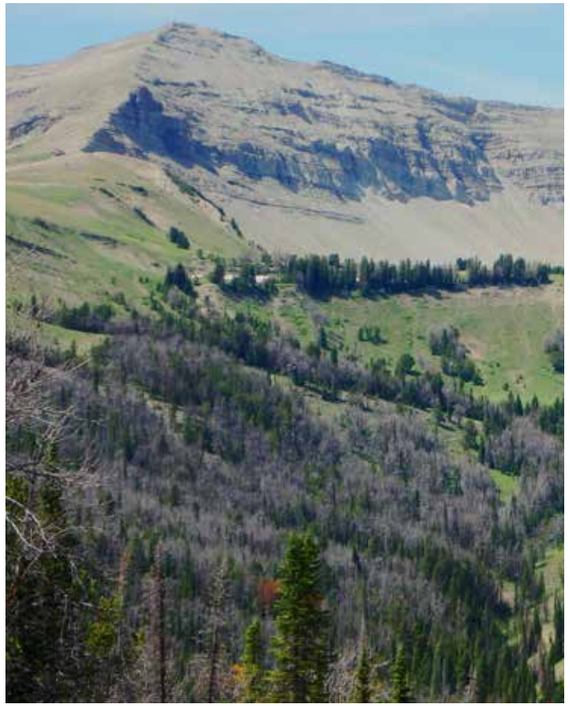
- Promote the use of Good Neighbor Authority with all seven National Forests and Bureau of Land Management units to build workforce capacity to facilitate forest resiliency, wildfire risk reduction, and other restoration goals on federal forest lands in the Priority areas for Focused Attention.
- Expand and promote education and outreach efforts on cross boundary tools and authorities, like the Wyden authority to increase active stewardship on private lands, and the benefits of enduring partnerships.
- Foster a work environment where a spectrum of partners, including collaboratives, federal, state, tribal and local government agencies, institutionalize cross-boundary projects.
- Support state and federal programs that monitor our joint progress over time.
- Provide outreach and education that improve understanding of and support for wildfire managed for resource benefit that may be used, when appropriate.

IMPROVE WATERSHED CONDITIONS AND WATER QUALITY ACROSS FORESTED LANDSCAPES.

- Support projects that maintain or improve intact and connected forested landscapes and watersheds.
- Explore opportunities to expand funding for streamside and instream restoration and actions to improve impaired waterbodies.
- Maintain and strengthen the level of compliance with Forestry Best Management Practices across all ownerships.

MITIGATE AND ADAPT TO THE IMPACTS OF CLIMATE CHANGE TO MONTANA'S FORESTS.

- Use best available science and support peer-reviewed and agency research on the effects of climate change on forested landscapes.
- Encourage reforestation efforts after severe events to promote regeneration of suitable native species that may be more resilient to the impacts of climate change.
- Develop a forest resilience monitoring program to inform management decisions and actions to manage for forest health.
- Build on the recommendations specifically stated in the Montana Climate Solutions Plan:
- Use forest management practices to maintain structure and composition to increase resiliency to insects, disease, and uncharacteristic stand-replacing wildfires.
- Protect municipal watersheds.
- Maintain the long-term capacity of forests to continue to buffer emissions as natural carbon sinks.



LOCAL GOVERNMENT ENGAGEMENT AND MONTANA FORESTS

Local governments across Montana play a key role in working with agencies, landowners, and stakeholders across all lands within their jurisdiction. The DNRC's Local Government Program provides additional grant funding and capacity to support County Commissioners and their staff when they engage on federal land management and cross-boundary forestry issues. The Forest Advisor, funded in part by the USDA Forest Service, has increased capacity and support to local governments and County Commissioners to help ensure forest restoration and management actions are aligned with local priorities and county plans. These deliberate engagements have strengthened project proposals and increased local government support for active forest restoration and management activities.

WILDFIRE RISK

In Montana, wildfires cover a spectrum of conditions from low-severity localized fires to landscape-scale high-severity wildfires (Neary & Leonard, 2015). Over the past 100 years, however, the practice of large-scale fire exclusion and a history of varying management practices have changed the way Montana's forests respond to and recover from wildfires. Many of the forests that were once dominated by fire-tolerant tree species and moderate fuel loads are now dominated by species that are less fire-tolerant, resulting in uncharacteristically dense stands with excessive fuel loads (Arno et al., 1997; Mortiz et al., 2014). Increased fuel loading, shifted fire regimes and forest dynamics, insect epidemics, climate change, and drought are all major factors that are increasing wildfire risk in Montana.

While wildfire will always play an important and necessary natural role in Montana's forests, the current state of the forests has created a fire-prone landscape more susceptible to high-severity wildfires. Today, over 85 percent of Montana's forests are at elevated risk of uncharacteristic wildfire (DNRC, 2020). Similar to other states throughout the West, Montana's fire seasons are becoming longer and more severe (Holden et al., 2018). Increasingly, Montana experiences megafires, fires over 100,000 acres, and the average fire season is 40 days longer than it was 30 years ago (Freeborn et al., 2016).

High-severity, uncharacteristic wildfires increasingly pose a threat to communities, critical infrastructure, and the millions of acres of forests and grasslands across Montana. Over the past 25 years, one in eight new homes in western Montana were built in high wildfire hazard areas, and over 64 percent of Montanans are currently living in the WUI (Radeloff et al., 2018). Because of the increased development in the WUI, the complexity and cost of fighting fires, the chance of unintended human-caused ignitions, and the strain on firefighting resources have all risen substantially (Williams, 2013). The demands posed by these current conditions and the now year-round threat of wildfire exceeds the current capacity of fire preparedness and response resources. The ability to adequately address community needs, proactively minimize their risk, and prepare for the eventuality of wildfires is oftentimes over-extended.

Active forest management, such as mechanical thinning and prescribed fire, is one of the most important tools to reduce the risk and severity of wildfire alongside a robust community preparedness strategy. While

active management cannot eliminate wildfires, it can help moderate fire behavior under certain fire conditions. Management can reduce fire severity and other impacts, and can create safer conditions for firefighters responding to wildfires (Reinhardt et al., 2008). It will be essential to focus management and restoration efforts on the areas that have been identified as *Priority Areas for Focused Attention*, where wildfire risk and forest health concerns are greatest. Restoring fire to an ecosystem is essential to maintain desired forest conditions. Prescribed fire helps to maintain vital ecosystem functions, while minimizing both short- and long-term fire risk to nearby populations and critical infrastructure. Federal agencies are also exploring opportunities to manage wildfires for resource benefit or making the strategic choice to use naturally ignited fires to achieve resource management objectives, where appropriate.

Although management actions can reduce the risk and severity of wildfire in certain forest types under some fire conditions, it cannot eliminate the impacts of fire on Montana communities and people. The protection of the public and firefighters is always the highest priority and, given the expansion of the WUI in Montana, community protection is a high priority as well. Managers must deliberately engage with Montanans to help make their homes and communities fire adapted and anticipate wildfire as an inevitability of the landscape in which they live (Calkin et al., 2014). Homeowners can often take simple and inexpensive mitigation actions to improve firefighter and public safety, greatly reduce their homes' susceptibility to windblown embers and radiant heat, and drive down the costs of fire suppression. Additionally, local government planning efforts that reflect the increasing risk of wildfire in the WUI must be supported. Practices and laws also need to evolve to reflect the current wildfire risks to communities and infrastructure. By helping community members understand how their actions will allow them to safely coexist with wildfire, Montana can foster fire adapted communities across the state and ensure a safe and effective response to wildfires.

The risk of wildfire to lives, property, and natural resources is ever present in Montana, with over 20 million acres at an elevated risk of wildfire, including over 3 million acres in the *Priority Areas for Focused Attention* (DNRC, 2020). Creating more resilient forests and communities will require a comprehensive approach. No single entity can address the wildfire risk challenges alone. It will require strong partnerships, innovative approaches, and a commitment to work with one another across real and perceived boundaries.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Reduce the risk of wildfire to communities, water supplies, natural resources, critical infrastructure and other values of concern while restoring characteristic fire-adapted landscapes in a manner appropriate to local fire regimes.

Strategies to achieve this goal include:

REDUCE WILDFIRE RISK TO COMMUNITIES, WATERSHEDS AND INFRASTRUCTURE.

- Prioritize lands within *Priority Areas for Focused Attention* when planning wildfire risk reduction projects.
- Use the Montana Wildfire Risk Assessment to focus community risk reduction, community preparedness, fire adaptation, and watershed protection efforts into areas of greatest risk within the *Priority Areas for Focused Attention*.
- Invest in agency capacity to implement a variety of treatment types, including mechanical treatment, prescribed fire, and outcome-based grazing, to increase the pace and scale of hazardous fuels treatments in *Priority Areas for Focused Attention*.
- Better serve Indian Country by engaging tribes in Montana in identifying programs of work that address forest health and wildfire risk issues in and around tribal communities.
- Expand programs that offer technical and financial resources to communities to treat landscapes where federal lands and private property are adjacent.
- Continue to provide cost-share programs and grants to improve forest health and fire management.
- Explore opportunities to expand funding resources for communities to mitigate impacts from recent wildfire events and enhance post-fire recovery.
- Support the Forest Legacy Program, conservation easements, and other incentive-based voluntary efforts to conserve high priority working forests and prevent poorly planned urban expansion.
- Explore opportunities to develop a consistent tracking system to account for wildfire response and wildfire risk reduction treatments across ownerships and jurisdictions.
- Expand, when possible and appropriate, the use of wildfire managed for resource benefit in such a way that restores ecosystem function while minimizing the negative impacts on human populations.

RESTORE RESILIENT LANDSCAPES WITH PRESCRIBED FIRE.

- Establish a Montana Prescribed Fire Council to facilitate and coordinate the increased use of prescribed fire and low-risk wildland fire in Montana to restore fire adapted landscapes.
    - Priorities for the Council include taking a strategic and proactive role in identifying policy and resource barriers, as well as incentives to expand the use of prescribed fire and low-risk wildland fire across all ownerships.
- Increase the agency capacity to use prescribed fire through training and by establishing cooperative agreements to allow for the sharing of resources and personnel across all ownerships.
    - Develop and fund interagency prescribed fire crews and teams to provide additional workforce capacity.
- Work with willing private landowners to identify and overcome barriers to the widespread application of prescribed fire for maintaining desired ecological conditions and fuel loadings, including insurance liabilities.
- Expand and promote education and outreach on the historical role of fire in western landscapes, on using fire as a management tool, on smoke management, and on the benefits of low-risk wildland fires where allowed.
    - Support the efforts of land management agencies, universities, state agencies, and others to engage Montanans on the air quality regulations, the permitting process, and the public health benefits of using prescribed fire.

FOSTER FIRE-ADAPTED COMMUNITIES.

- Expand investment in local government capacity to contribute to all three tenants of the National Wildland Fire Management Cohesive Strategy, realize the goals and objectives of their Community Wildfire Protection Plans, and engage land managers in relevant planning and project efforts by providing funding, technical assistance, and facilitating shared learning.
- Provide local, state, and federal agencies with additional staff resources dedicated to community preparedness and fire prevention efforts to coordinate and support risk reduction activities.
- Support the efforts of land management agencies, universities, emergency services, and others to engage Montanans in preparing their homes, properties, and communities for wildfire.
    - Develop a concerted public outreach and education effort that is tailored to local needs and conditions to help landowners understand the severity of wildfire risk and build an understanding that their mitigation efforts can save lives and minimize damage.
- Support state and federal agency engagement with local governments on land use planning.
    - Promote codes and ordinances that better reflect the conditions on the ground and the growing complexities of fighting wildfire in the WUI.
- Continue to emphasize the home ignition zone, neighborhood scale initiatives, and the interplay between communities and the health of nearby landscapes.
- Amplify existing collaboratives and create new opportunities for communities to form coalitions and leverage partnerships to improve wildfire adaptation.
- Build awareness of collaborative opportunities to address wildfire risk, such as the Fire Adapted Montana Learning Network.

INCREASE FIREFIGHTER SAFETY AND EFFECTIVENESS.

- Provide additional funding to support year-round employment opportunities to adequately staff the fire year.
- Improve training and development programs to expand the skillsets of the wildland firefighting workforce.
- Continue to provide grants, equipment, suppression vehicles, training, and prevention materials to fire departments through existing programs, like the Rural Fire Capacity Program and the State-County Cooperative Fire Protection Arrangement.
- Provide incentives for local government fire services to be robust and effective at initial and extended attack.
- Develop and modernize data capture systems to standardize fire data across Montana.

MITIGATE THE IMPACTS OF CLIMATE CHANGE ON WILDFIRE EFFECTS.

- Increase post-fire recovery efforts, such as reforestation and tree planting following severe wildfire events and when natural reforestation is unlikely.
- Support peer-reviewed and agency research on the effects of climate change on forested landscapes and wildfire.
- Build on the recommendations specifically stated in the Montana Climate Solutions Plan:
    - Develop strategies to integrate climate adaptation with disaster mitigation plans and wildfire planning efforts to support resilience planning and facilitate implementation.
    - Continue to address wildland fire risks through coordinating interagency planning and response, supporting wildfire-adapted communities, and building resilient landscapes through active forest management to improve safety and protect communities across ownership boundaries.
- Increase public awareness of the impact of climate change in creating longer, larger fire seasons so that they better understand the importance and urgency of their role in fostering fire adapted communities.

COUNTY CO-OP PROGRAM:

By formally partnering with all 56 Counties in Montana, DNRC ensures wildland fire protection on over 45 million acres of State and private land through an arrangement known as the State-County Coop Fire Protection arrangement.

Through this arrangement, Montana counties agree to provide the basic level of wildland fire protection through a system of rural firefighting organizations and local personnel. These county and local government firefighters provide initial attack and, in most cases, extended attack on wildland fires in their jurisdiction. Thousands of fires are contained and controlled each year without large-scale intervention by wildland fire protection agencies due to the effectiveness of the program.

In return for this service, counties receive DNRC support through organizational and technical assistance, fire equipment, training, and fire response assistance when needed. When a wildland fire exceeds the capacity of the county, DNRC mobilizes to assist the county, bringing the considerable resources of the State and its federal partners at no additional cost to the county.

The State-County Coop Fire Protection arrangement has been a highly effective fire protection model in Montana for the past 50 years and this success can be attributed to the enduring partnerships that exist across the state.

WORKING FORESTS AND ECONOMIES

A strong and diverse forest industry is essential to meeting forest health and wildfire risk reduction goals. It provides the workforce and equipment needed to help reduce excessive fuel loads, enhance recreational opportunities, complete watershed restoration work, improve wildlife habitat, and establish and maintain road networks for public access, active management, and wildland fire response. Montana is fortunate to have a largely intact and integrated forest industry, which commodifies a wide range of material through active forest management and restoration activities. This affords forest managers the ability to generate revenue from active management, or at the very least, significantly drive down the cost on an acre by acre basis. Without a robust and diverse industry, the cost of restoration and management treatments would be cost prohibitive at a meaningful scale.

Montana has a wide array of forest products manufacturers, ranging from both large and small sawmills, post and pole mills, facilities that manufacture products from mill residuals, firewood yards, small niche enterprises selling finished wood products, and the country's first manufacturer of cross-laminated timber. Montana has eight larger sawmills primarily situated in the western part of the state that account for approximately 95 percent of the state's lumber production and approximately 70 smaller mills that account for the remaining 5 percent. Almost all (99.5 percent) of mill residuals generated by both large and small mills are utilized by other manufacturers (BBER, 2017). While the forest products industry faces the challenge of finding markets for smaller sub-merchantable material, entrepreneurs continue to explore market solutions through innovations such as biofuels and biochar. All of these facilities are increasingly important to the economic viability of Montana's communities and to the ability of landowners and managers to complete effective forest management and restoration. Future diversification of timber products will continue to be necessary, and challenging, as the market for forest products shifts. Diversification and investment in new technologies will be an integral part of increasing the utilization of raw forest products and making Montana's forest markets regionally competitive.

Montana's forest products industry is challenged by several issues, among them are inconsistencies in commercial product supply, labor shortages, distance to mills, and competition in national and international markets. Many of the issues are interrelated and

addressing them will be necessary not only support Montana's forest industry, but also to ensure the collective ability to manage forests into the future.

The available timber supply is a major factor impacting the size and health of the forest products industry (BBER, 2017b). As of December 2019, Montana mills were running at 60-65 percent capacity, and nearly two-thirds of the state's large sawmills and small wood products facilities have closed since 1990 (Morgan et al., 2019). Recent strong demand in lumber markets coupled with COVID-19 related sawmill production reductions across the world has led to record high lumber prices (NAHB, 2020). The summer surge and consistent upswing in prices normally ends around July, but has continued unabated into late September in 2020. As October nears, the market appears to be stabilizing and prices are beginning to flatten. It is expected that lumber prices will return to a more traditional range over the winter (DNRC Internal Communication, 2020).

While there have been sharp declines in forest industry employment since 1990, over 9,000 people throughout the state continue to work in wood products manufacturing, logging, or other forestry related employment (BBER, 2017b; BBER, 2017). Much like the general manufacturing sector in the U.S., Montana's forest industry continues to be challenged by labor shortages and recruiting and retaining a skilled workforce.

Over 80 percent of Montana's wood products are exported to markets outside of the state, where they must compete with other commodity products that are often sourced much closer to the consumer (USDA FS, 2020). Transporting goods to markets substantially reduces the profit margin for most of the existing industry. Mills that have weathered the market fluctuations and avoided closures relied on product diversification, innovations, and investing in technology capable of economically processing small diameter material. Future diversification of timber products will continue to be necessary and challenging as the market for forest products shifts.

Conservation of working forested lands is not only critical to the forest products industry, but also to many of the intrinsic values of forested landscapes. The Forest Legacy Program was established in 1990 by USDA Forest Service in response to the conversion of private timberlands to other uses. The term "working forests" was coined to capture the variety of public values that were targeted to be conserved through Forest Legacy Program. Forest conservation is accomplished voluntarily through cash purchases, donations, or a combination thereof. Nationally, the program has helped conserve about 2.8 million acres of working forests. In Montana, the Forest Legacy Program has preserved a total 260,742 acres through permanent conservation as required and outlined in the *Assessment of Need* produced by Montana Fish Wildlife and Parks.

While these issues are not new, they continue to shape the industry, especially in the last few decades. With the increasing need to improve forest health and reduce wildfire risk across Montana, maintaining working forests and the industry that supports them is crucial. Montana's forest industry is an important and necessary part of achieving landscape-scale forest restoration and management across the state, so Montana's forests remain healthy and sustainable for generations to come.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Across all land ownerships, maintain working forest landscapes that support multiple values, including the forest products industry and infrastructure.

Strategies to achieve this goal include:

MAINTAIN WORKING FOREST LANDSCAPES FOR MULTIPLE BENEFITS.

- Pursue the conservation of large, unfragmented tracts of forest land through tools like conservation easements and expand the use of existing tools and authorities where current infrastructure exists.
- Maintain industry capacity to handle expected increase in pace and scale of cross boundary projects.
- Support conservation projects that provide multiple social, economic, and ecological benefits, including an ongoing supply of forest products, public access to recreation opportunities, watershed health, and wildlife habitat.
- Increase outreach and engagement with landowners, promoting planning, and provide resources for the stewardship of family forest lands.
- Invest in innovative targeted marketing strategies and expand partnerships to exponentially increase stewardship activities on non-industrial private forest lands.
- Work with DNRC Trust Lands Management Division to advance opportunities to achieve multiple objectives on forested state trust lands.
- Support projects that highlight the dynamic use of landscapes including outcome-based grazing, alternative energy projects, and streamside restoration.
- Increase data sharing across jurisdictions specifically; road inventories and right of way and emphasize collaborative transportation planning where appropriate.
- Prioritize and amplify local collaboration, including the development of projects that accomplish multiple objectives and meet local resource needs.

SUPPORT AND MAINTAIN THE FOREST PRODUCTS INDUSTRY AND MILLING INFRASTRUCTURE.

- Increase fiber and volume availability to produce a consistent and reliable supply, to maintain and increase forest products infrastructure to levels required to meaningfully address forest health and wildfire risk reduction objectives.
- Support the efforts of land management agencies, universities, and others to engage Montanans on the benefits of forest management and using wood.
- Support the efforts of land management agencies, universities, and others to engage Montanans on the connection between healthy forests and a vibrant forest products industry.
- Expand use of existing tools and authorities that provide funding for restoration projects within *Priority Areas for Focused Attention*.

SUPPORT THE DIVERSIFIED USE OF WOOD PRODUCTS.

- Support market and business developments and innovations for forest products, biomass and wood energy across the state.
- Work with partners and the University of Montana to expand forestry workforce recruitment opportunities and retention.
- Support new industries and marketing programs like cross laminated timber, mass timber construction, and Buy Montana Wood that encourage the use of wood products in the built environment.
- Explore new technologies to increase the utilization of small diameter wood and restoration by-products.
- Incentivize or provide cost-share programs for wood innovation and alternative energy sources to promote Montana wood products and encourage the production of new and innovative wood products applications.
- Assess forest marketing, delivery, and utilization in Montana.

ENHANCE THE LOCAL ECONOMIC IMPACT FROM INVESTMENT IN LOCAL PROJECTS.

- Expand the use of stewardship contracting and other authorities to award work locally.
- Monitor available funding resources including Secure Rural Schools and Payment in Lieu of Taxes.

GOOD NEIGHBOR AUTHORITY

DNRC, USDA FS, and BLM, in close partnership with other agencies, industry, and conservation groups, are working to increase the amount of forest and watershed restoration on federal and adjacent lands through the Good Neighbor Authority (GNA). Authorized by 2014 and 2018 Farm Bills, GNA allows the USDA FS and BLM to enter agreements with DNRC to plan and implement restoration work on federal lands. By 2021, all seven national forests and BLM land in Montana will have forest restoration projects implemented through GNA. The project benefits of GNA timber sales include improving forest and watershed health, decreasing wildfire intensity and severity, enhancing the resiliency to future insect and disease outbreaks, maintaining and supporting the wood products industry, and creating local, good-paying jobs in Montana communities.

GNA BY THE NUMBERS: (as of September 23th, 2020; will insert most recent numbers before publishing)

$3.7 million revenue under contract

25.9 MMBF sold

10 non-timber sale restoration projects completed or under contract

11 sales to be advertised in FY21

Through GNA agreements revenue from GNA timber sales, USDA FS, BLM, and other partner funding is used to complete restoration activities. In addition, state service contracts and added staffing capacity from DNRC are able to accelerate restoration activities, such as NEPA support, field data collection, watershed restoration and fuels reduction activities. Restoration activities will increase in scope and scale as revenue from GNA timber sales increase.

Through GNA, Montana is improving forest health and resiliency, reducing threats to communities and watersheds from destructive wildfires, and creating more jobs and local economic benefits.

BIODIVERSITY AND HABITAT CONSERVATION

The forested ecosystems in Montana are diverse and extensive, providing habitat for the state's fish and wildlife populations. Many species contribute to the health and integrity of ecosystems, making conservation and restoration of forests integral to sustaining the biodiversity that makes Montana unique. Forests also provide ecological, recreational, economic, and aesthetic values to Montana citizens and visitors.

Forest ecosystems are dynamic and constantly change within their natural range of variability. Montana's forests, however, are currently facing challenges that threaten their ability to provide the habitat and conditions necessary for healthy, viable fish and wildlife populations (Hansen et al., 2002; Mortelliti et al., 2010; Prugh et al., 2010). Conserving and restoring forests, and reducing threats to allow for natural disturbance patterns is critical for the maintenance of healthy, functioning ecosystems (Thom & Seidl, 2016). The composition and structure of species within a forested ecosystem is altered as natural disturbance regimes are transformed by influences such as management decisions, climate change, and uncharacteristic insect and disease outbreaks (Long, 2009). Management for ecological resilience also must address the impact of human-caused disturbance patterns, including those resulting from recreation, roads, structure development, and changing land uses. As human activities and developments disrupt these natural systems, they affect the status and trends of ecosystems and their component fish, wildlife, and plant communities (Haddad et al., 2015; Seidl et al., 2016).

Disruption of the natural fire regime and other land use changes have had an impact on forested ecosystems, which has had significant implications on habitat and biodiversity (Bradstock et al., 2005). A natural fire regime once maintained a range of plant communities and structural conditions (Arno et al., 2000), which are important to a variety of native aquatic and terrestrial animal species. The shift away from natural fire regimes has shifted the plant communities in Montana's forests away from those that are fire resistant. Low to mid-elevation ponderosa pine forests across the state are denser, with more trees per acre, while the species composition has gradually shifted to include more fire-susceptible species. (Keeling et al., 2006). Recent research on the effects of reintroducing frequent, mixed-severity fire to such altered forest ecosystems indicates it can restore historic tree and shrub species compositions, and thereby improve habitat conditions for native fish and wildlife (Larson et al., 2013).

Conifer expansion into grass or shrub-dominated uplands, often due to a lack of fire, can reduce the value of these important habitats for a variety of wildlife species (Coates et al., 2017; Schirokauer, 1996; Grove et al., 2005; Hamilton et al., 2019). For example, tall conifers that pioneer into sagebrush grasslands are avoided by sage-grouse, thus directly reducing their habitats for varying periods of time (Severson et al., 2017). Shading from coniferous trees can also reduce preferred forage of ungulates—browse or grasses—particularly important within wintering areas.

Without natural fire disturbance, there has been an increase in Douglas-fir, which is able to out-compete other tree seedlings that cannot become established under shadier or densely stocked stands. In western Montana, Douglas-fir has replaced ponderosa in 40% of its original area, and western white pine has been reduced by 95% due to insect and disease outbreaks (Arno et al., 2000; Keeling et al., 2006). Over time, the density of Douglas-fir, lodgepole pine, and Engelmann spruce has increased and replaced stands that were once composed of sparse ponderosa pine. The natural fire regime has been further altered by harvest of large ponderosa pine trees, which left behind other fire-susceptible species in their place. The resulting dense forests of differing composition provide habitats that represent a departure from historic conditions, which may not support the same communities of wildlife species as they once did.

One of the greatest threats to Montana's wildlife and biodiversity is the loss of forested habitat through habitat fragmentation, human development, and other forms of habitat conversion. Eliminating or fragmenting habitats can lead to local extirpation or reduced resilience to new stressors, such as climate change or other factors (Beller et al., 2019; Hames et al., 2006). Individual habitat changes in isolation may seem minor, but effects of habitat changes can accumulate over time, magnifying their overall impact (Smith et al., 2011; McGarigal et al., 2001; Nitschke, 2008). Severe, uncharacteristic disturbance can also compromise habitat continuity and connectivity. Damage caused by large wildfires and widespread mortality from insect and disease outbreaks can degrade habitat within core forested areas, interrupting key migration corridors (Adhikari & Hansen, 2018).

There are currently 16 animal and three plant species in Montana that are listed as threatened or endangered under the Endangered Species Act (ESA) and many more considered "species of concern" by the Montana Natural Heritage Program (MTNHP, 2019). Federal agencies also identify at-risk species that overlap with the ESA species, including Bureau of Land Management (BLM) Special Status Species and USDA Forest Service Species of Conservation Concern. Among these are 8 animal species (mammals, birds, and invertebrates) dependent upon forested ecosystems and the cold, clean waters they provide for their continued survival and future success. Thus, conserving forested ecosystems is essential to protecting all of Montana's sat-risk and imperiled species, as well as ensuring the health of our forests.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Improve and maintain Montana's wildlife and biodiversity, including maintaining and restoring connected habitats, through collaborative approaches.

Strategies to achieve this goal include:

MAINTAIN AND IMPROVE HABITAT CONDITIONS FOR HEALTHY AND VIABLE POPULATIONS OF NATIVE SPECIES.

- Support integrated forest management and restoration projects that provide measurable benefits for fish and wildlife in *Priority Areas for Focused Attention,* including at-risk and imperiled species.
- Support projects that integrate forest management with conservation of critical habitat, especially for fish and wildlife species of concern.
- Increase use of programs, like Habitat Montana, to aid in the conservation of habitat and support habitat connectivity throughout the state.
- Promote and maintain desired landscape conditions that restore and sustain population of fish and wildfire through planning and implementing habitat management plans.
- Promote important stewardship principles including wildlife and fisheries conservation on family forest lands.
- Create opportunities to form coalitions and leverage public-private partnerships to maintain or improve habitat conditions, including conditions for imperiled and at-risk species.

IMPROVE NATIVE WILDLIFE MOBILITY AND MAINTAIN AND RESTORE CONNECTED LANDSCAPES AND WATERSHEDS.

- Pursue voluntary, incentive-based conservation of large, unfragmented tracts of forest land while working with local government officials and neighboring landowners through the Montana Forest Legacy and other programs.
- Incorporate wildlife movement and migration needs information when planning for developments that might act as barriers or result in human-wildlife conflicts.
- Support projects to remove unnecessary roads and upgrade low standard roads to reduce stream sediment loads, and to improve passage and connectivity for native aquatic species.
- Ensure regeneration of desired tree and shrub species by either natural or artificial regeneration supported by programs such as the state of Montana's seedling nursery or the Forest Service nursery in northern Idaho.
- Invest in and work to implement the outcomes of watershed and collaborative groups to help resolve challenging land management policies and projects.
- Build on the recommendations specifically stated in the State Wildlife Action Plan:
    - Work with appropriate agencies to maintain quality aquatic habitats and to mitigate impacts and threats to fish and wildlife species of greatest conservation need.
    - Prioritize conservation easements and acquisitions adjacent to current conservation investments in order to create contiguous protected habitat that provide habitat linkages across large landscapes.
    - Support agency and private conservation activities and management practices that encourage and support sustainable land management practices, maintain or improve riparian vegetation, and maintain streambank and channel stability in excellent condition.
    - Encourage restoration of natural fire regimes where appropriate or implement other management actions that mimic the ecological processes provided by fire.

MITIGATE THE IMPACTS OF CLIMATE CHANGE TO WILDLIFE AND BIODIVERSITY.

- Improve baseline data and information on habitat conservation and biodiversity in Montana.
- Support peer-reviewed and agency research on the effects of climate change on wildlife migration and movement patterns and improving the accuracy of hydrologic projections.
- Consider wildfire components of projects in the *Priority Areas of Focused Attention*.

HUMAN AND COMMUNITY HEALTH

Because of the vast, open landscapes across the state, Montana has a unique outdoor heritage that is built on and supported by a healthy environment. Forests across Montana help ensure a healthy environment by providing good air quality, clean water, and other human health benefits.

While Montana is a state that enjoys good air quality for large parts of the year, air quality across the state can be highly variable depending on location, time of year, and the severity of the wildfire season. Longer and more severe wildfire seasons are leading to extended periods of wildfire smoke, especially in high population centers. According to the American Lung Association 2019 annual report, Montana is home to six of the 25 counties in the U.S. most affected by short-term particle pollution: Ravalli, Lewis and Clark, Missoula, Lincoln, Silver Bow, and Flathead. The city of Missoula ranks as the fifth-worst affected by short term particle pollution and eleventh for year-round particle pollution (ALA, 2019). Smoke often becomes trapped in the bowl-shaped valleys that form much of western Montana, and can linger until a weather system moves through.

Like air quality, Montana's water resources are essential to the health and economic well-being of all Montanans. Not only is water critical for municipal and domestic uses, water also supports agricultural and mining industries, fisheries, and recreational activities. Forested landscapes play an important role in ensuring that both the surface and groundwater is clean and abundant by slowing runoff, reducing erosion, and enabling groundwater recharge. Organic litter on the forest floor and root systems in the soil help filter water through the ground rather than as surface water, reducing overland flow (DNRC, 2015b). Montana encompasses both important river headwaters and groundwater recharge areas – areas that are often forested. Forest management practices in the state are designed with the intent of maintaining and improving water resource conditions, especially in the case of degraded water quality that occurs when uncontrolled wildfire burns in important watersheds.

Recreational use of Montana's forests, particularly on public lands, is central to Montanans' identity, way of life, health and fitness, and increasingly their livelihood. It's a major reason why people live in and visit Montana, driving both the culture and the state economy. When surveyed, 87% of Montanans identified themselves as outdoor recreation enthusiasts

and 96% believe that outdoor recreation is critical to the economic future of the state (Montana Outdoor Heritage Project, 2019). The exceptional recreation opportunities that Montana's forested landscapes provide can present management challenges for land managers and local government. With growing popularity and use comes increased pressure on natural ecosystems, infrastructure, and the strategies used to balance these varied uses. Forest-based recreation opportunities and experiences are inherently dependent upon the conditions of the forests. Although dead and dying trees are a natural part of a forest, they can pose a threat to life and property when located in or near developed recreation sites, such as campgrounds, trailheads, fishing access sites, and along public roads.

Whether it's the clean air and water or the many recreational and health benefits that forests provide, Montanans recognize the need to improve forest health and reduce wildfire risk across the state. Due to the current conditions of forests, Montana's ability to understand and plan for natural hazards and disasters is imperative to protect communities and natural resources from damage or, in the most severe cases, loss of life. It is critical that federal, state, tribal and local governments work together to acquire the proper resources and equipment to meet the projected need and keep Montanans safe. Montanans themselves have a role, as they can take actions to build awareness, expand collaborative opportunities, and mitigate risk across boundaries. Fostering human and community health in a heavily forested state requires an organized approach in responding to natural hazards and disasters to protect the forested environments and ecological services that so many Montanans rely on.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Maintain a healthy and resilient forest that provides public benefits and ecosystem services for current and future generations of Montanans.

Strategies to achieve this goal include:

SUPPORT AND MAINTAIN HEALTHY AND FUNCTIONING HYDROLOGIC SYSTEMS.

- Support projects that maintain or improve intact and connected forested landscapes and watersheds.
- Prioritize management and restoration projects in *Priority Areas for Focused Attention* that support municipal watersheds and other beneficial water uses.
- Explore opportunities to expand funding for streamside and instream restoration and actions to improve impaired waterbodies.

INCREASE PUBLIC AWARENESS OF THE BENEFITS OF USING PRESCRIBED FIRE YEAR-ROUND TO DECREASE THE SEVERITY OF WILDFIRES AND ASSOCIATED PUBLIC HEALTH IMPACTS RESULTING FROM WILDFIRE SMOKE.

- Support the development of plans to manage smoke and public health and community readiness for the effects of wildfire.
- Coordinate closely with Montana Department of Environmental Quality and the Montana and Idaho Airshed Group to identify opportunities to increase year-round burn permitting across all ownerships and jurisdictions.
- Support ongoing education and outreach campaigns with the Department of Environmental Quality, Montana and Idaho Airshed Group, conservation partners, local government, and fire authorities to increase the use of prescribed fire throughout the year.

MAINTAIN OR INCREASE RECREATIONAL OPPORTUNITIES.

- Pursue opportunities to increase access to public lands through a variety of mechanisms including land exchanges, permanent access and conservation easements.
- Work with the Montana Legislature and Congress to maintain or increase funding opportunities for recreation opportunities.
- Explore opportunities to manage recreational opportunities and visitor use across ownerships and jurisdictions.
- Work to expand education and interpretive opportunities regarding the values, services, and benefits of forests in Montana.
- Build on the recommendations specifically stated in the Statewide Comprehensive Outdoor Recreation Plan (SCORP):
    - Develop interagency collaborative data collection effort to gauge statewide and regional outdoor recreation related visitor use.
    - Assist in the establishment of long-term funding for a cross jurisdictional Access Coordinator that works across jurisdictional boundaries. Identify "locked" public land and develop cross-jurisdictional strategies to find solutions.
    - Support and expand the efforts of the Montana Office of Outdoor Recreation.
    - Promote coordination and communication between outdoor recreation managers, and emergency management and first responders.
    - Balance outdoor recreation use with ecological function of natural resources including fish, wildlife, and their habitats.

MITIGATE THE IMPACTS OF CLIMATE CHANGE TO THE PEOPLE OF MONTANA.

- Maintain healthy forests to sequester carbon and maximize human health and ecosystem benefits.
- Support programs to improve community readiness to prepare for and respond to natural disasters.
- Support peer-reviewed and agency research on the effects of climate change on human health and forested landscapes.
- Promote the use of urban tree canopy cover as a tool to mitigate the impacts of climate change and urban heat islands.
- Build on the recommendations specifically stated in the Montana Climate Solutions Plan:
    - Incorporate strategies from the forthcoming assessment of climate-related health risks and monitor climate-related illnesses to support local, regional and tribal health providers in response to extreme climate events such as extreme heat, vector-borne diseases, water-related illnesses, food safety and nutrition, wildfires, allergens and air quality, and mental health.
    - Ensure local infrastructure such as schools, hospitals, community centers, and shelters incorporate adaptation strategies to address the needs of the young, sick, aging and other vulnerable populations related to climate impacts such as smoke and air quality, extreme heat, flooding, winter emergencies and distributed energy needs.
    - Develop climate information and tools specific to the outdoor recreation and tourism sectors and include climate adaptation strategies related to outdoor recreation and tourism in local plans and policies such as parks and recreation plans and hazard mitigation plans.

WILDERNESS AREAS

Established by Congress and authorized under the Wilderness Act of 1964, the National Wilderness Preservation System includes over 700 wilderness areas in 44 states, totaling more than 107 million acres. Montana is home to 16 Congressionally designated wilderness areas, representing approximately 3.5 million acres (about 3.75%) of the state's lands. They include the highest peaks in the state, as well as low-lying marshland suited for wildlife refuges.

The Wilderness Act defines a wilderness area to be:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this chapter an area of underdeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Montana's wilderness areas are home to thousands of species of flora and fauna – a number of them threatened or endangered. For many, wilderness areas are places of growth, reflection, and solitude. Montana's wilderness areas help maintain a connection to the land that can be difficult to find elsewhere: the silent, breathtaking views; the still turquoise waters of the glacial lakes; the rugged ridgelines dotted with snow year-round; and the sense of awe that these wild places instill.

Wilderness areas are not only spectacular places to find quiet and connection, but they are among the most vulnerable to change. Plant and animal communities, particularly in high-alpine areas, are slow to respond to changing conditions and treats like insect and disease outbreaks and wildfire can greatly impact wilderness areas. Wilderness areas are not surveyed in the statewide insect and disease mapping efforts, leaving large areas of land unassessed.

URBAN AND COMMUNITY FORESTS

Some of the most important trees to Montanans are the ones in our own backyards, along our town's streets, and outside the businesses we frequent and enjoy. Montana's cities and towns contain a rich diversity of trees that are an important part of our history and that are critical to the environmental, social, and economic well-being and sustainability of our communities.

Over 180 tree species populate Montana's communities and 2017 estimates show that street and park trees across the state provide over $17 million per year in economic and ecological benefits. For every dollar spent on managing Montana's urban and community forests, nearly two dollars in environmental services and increased property values are returned (McPherson, 2002). Urban and community forests provide shade during our hot summers in urban heat islands. Shaded spaces can mean the difference of 20-40°F cooler than peak temperatures of exposed surfaces (EPA, 2019).

Trees add character to our communities and serve as wind breaks in our more wind-prone rural communities. They provide over $1.8 million in energy savings and intercept more than 122 million gallons of stormwater annually, easing the burden on our water treatment facilities and acting as an important filtration system for communities that rely on well water (DNRC, 2017). These publicly-owned forests sequester nearly 9.5 million pounds of carbon and remove over 20 metric tons of pollutants from the air on a yearly basis.

With the increase in wildfire and related smoke, urban forests are even more critical in improving air quality. With so many of Montana's states rivers and streams flowing through communities, trees along these waterways are important in intercepting pollutants, stabilizing banks in the event of flooding, and providing enjoyable recreational spaces.

Nearly 70% of Montana's population live within incorporated towns and unincorporated centers (US Census Bureau, 2010). As the population grows and development increases, community trees face the threat of removal without intentional and deliberate planning to retain them. Most municipalities across the state lack urban forestry capacity and expertise to ensure that planning incorporates the retention and growth of these beneficial forests.

In addition to threat of removal, Montana's urban

and community forests are generally old and lack the diversity to withstand major threats from invasive insects and disease. Many of the most valuable community trees were planted around statehood and are reaching the end of their life cycle. Dead and dying trees pose safety risks and are expensive to remove, sometimes costing over $10,000 for the removal of one large tree. While Montanans enjoy a diversity of tree species in our communities, nearly 42% of the total population is comprised of three species (ash, maple, and crabapple). Green and white ash make up nearly one-third of all of Montana's urban trees and are especially prevalent in eastern Montana. While urban forests face threats from numerous insects and disease, no threat is perhaps greater than the one facing the ash tree population. Emerald ash borer has not yet been found in Montana, but with detections in South Dakota and Colorado, it is likely inevitable that this invasive species arrives and causes a decline in urban and community forests.

Urban and community forests will play an import role in mitigating some of the effects of climate change through the ecosystem services and shade they provide. While they help with mitigation, they are still subject to the impacts of climate and will be increasingly vulnerable to excessive weather events, drought, and temperature fluctuations. Therefore, the health and vitality of our communities depends on vibrant urban and community forests.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Maintain biodiverse, healthy, and resilient urban and community forests in Montana.

Strategies to achieve this goal include:

INCREASE THE BIODIVERSITY, AGE CLASS, HEALTH, AND RESILIENCE OF TREES IN URBAN AND COMMUNITY FORESTS.

- Maintain statewide community tree inventories and prioritize updates every ten years.
- Support programs to plant tree species that aid in diversifying community tree populations.
- Support the efforts of land management agencies, universities, and others to engage Montanans on the benefits of urban and community forests and the need to maintain and manage urban trees.
- Encourage nurseries to supply diverse tree species as recommended by the Montana Urban and Community Forestry Association, especially for commercial planting.
- Promote and recommend medium and large tree species for planting to maximize ecosystem benefits.
- Explore additional opportunities to provide funding and grants to aid in medium and large species tree planting across Montana.
- Expand the use of the Community Forest Program to secure forested land adjacent to and within urban environments.
- Raise the awareness with local government officials that funding is necessary to maintain trees after being planted in order to provide benefits in the future.

INCREASE URBAN TREE CANOPY COVER TO ENHANCE ECOSYSTEM BENEFITS.

- Support the development of community management and implementation plans to aid in the management of current tree populations and promote short-range and long-range planning of tree planting.
- Encourage the planting of three trees for every person in urban landscapes in Montana.
- Establish reasonable canopy goals for communities with appropriate partners and organizations.
- Prioritize projects in communities with the highest population of ash trees, that contribute the most to match grant funds, and that do not have maintenance programs.
- Encourage counties and communities to include measures to protect UCF's in their CWPP and follow through with implementation of measures including fuels treatments, increasing resilient species, treating weeds, and identifying and developing safety zones.
- Actively promote stewardship and education on the services and value of Montana's urban and community forests to increase urban tree canopy cover.
- Promote the use of urban tree canopy cover as a tool to mitigate the impacts of climate change and urban heat islands.

MITIGATE THE FINANCIAL EFFECTS OF EMERALD ASH BORER TO MONTANA COMMUNITIES.

- Support the development of emerald ash borer management plans by providing technical expertise and additional funding. Prioritize rural and small communities where the capacity is limited.
- Support the development and maintenance of plans to rapidly identify and manage future potential outbreaks of emerald ash borer.
- Support programs following the removal of ash trees to replant tree species that aid in diversifying community tree populations.

SUSTAINING CROSS-BOUNDARY WORK IN MONTANA

When it comes to managing Montana's forests, the challenge to improve forest health and reduce wildfire risk is too great to be accomplished by any single person or organization. That's why the work of cross-boundary, collaborative forest restoration and management is more pressing than ever. In Montana, one of the gaps MFAAC identified in their deliberations was the lack of formal coordination to facilitate cross-boundary work among resource areas and partners. Currently, there are partnerships across the state accomplishing cross-boundary work, however, it is often done opportunistically and may only take place where agencies or other partners are able to identify and supply the capacity to formally coordinate among partners and across jurisdictions. These existing partnerships prove that in order to be successful, dedicated staff and organizational capacity is necessary to complete and sustain coordination over time.

At present, current agency resources and staffing capacity are not adequate to address the issues facing Montana's forests with the urgency that is required. There are existing authorities and funding sources being leveraged with great effect but to increase the pace and scale of work being done across Montana, additional resources will be required to protect Montana's ecosystems from further harm and to safeguard communities and infrastructure from wildfire events. Estimates show that across forest management agencies, fewer than 100,000 forested acres are treated annually with mechanized means or prescribed fire. With nearly 4 million acres identified in the *Priority Areas for Focused Attention*, it would take approximately 40 years to accomplish integrated restoration at that rate within those areas alone. All the while, conditions will continue to change and present more challenges likely beyond the extent of these areas.

In conjunction with *Forests in Focus 2.0* and *Shared Stewardship*, the Montana Forest Action Plan aims to help localize and facilitate work across boundaries with new partners and extend the effectiveness of already existing authorities to address this capacity issue. By sharing resources, outlining common goals, and supporting enduring partnerships for restoration,

outreach, and education, the Montana Forest Action Plan will create a roadmap for new collaborative work that will bolster durable, long term solutions.

The goals and strategies outlined in the *Montana Forest Action Plan* are based on the collective understanding of the threats and pressures that the forests, the state of Montana, and its citizens are facing. These recommendations are applicable to all partners throughout the state who work to improve the conditions of the forests and reduce wildfire risk to communities and infrastructure. Success will be measured in the number of acres treated, the number of communities and watersheds protected, the amount of wildlife habitat benefited, the number of jobs created, and in the endurance of partnerships. To help address the capacity issue, the *Montana Forest Action Plan* will support cross-boundary partnerships where they are already taking place and will also work to stand up a body that will provide statewide leadership towards collaborative forest restoration and management efforts.

To be successful, relationships with cooperators must be strengthened and new partnerships must be forged. Across Montana, there is a lot of cross-boundary work happening today, exemplified by the already strong existing partnerships. Building off this, the *Montana Forest Action Plan* will help to coordinate work and resources in the most critical areas of the state to address the collective problems of improving forest health and reducing wildfire risk.

RECOMMENDATIONS—GOALS AND IMPLEMENTATION STRATEGIES

The Montana Forest Action Plan aims to:

Sustain and prioritize landscape-scale, cross-boundary forest management and restoration projects across the state of Montana through collaborative engagement.

Strategies to achieve this goal include:

FORM AN IMPLEMENTATION ADVISORY COMMITTEE THAT WOULD BE ADMINISTRATIVELY ATTACHED TO THE DNRC TO OVERSEE THE IMPLEMENTATION OF THE MONTANA FOREST ACTION PLAN BEYOND THE SUNSET OF MFAAC.

- Oversee, advocate for, and assist with the implementation of the *Montana Forest Action Plan* and ensure efficient, effective, and collaborative cross-boundary management within *Priority Areas for Focused Attention*.
- Seek members with a diversity of perspectives to serve on the committee to ensure that actions reflect a broad set of values surrounding Montana's forests.
- Develop a charter that addresses purpose, roles and responsibilities, membership, voting, and scope of work.
- Seek additional capacity and staffing to sustain cross-boundary work.
- Track the progress of cross-boundary coordination in accomplishing recommendations within all sections of the *Montana Forest Action Plan*.
- Explore the development of a statewide financial structure and entity that would pool and leverage funding to greatly increase the amount and expedite the timing of cross-boundary work.
- Develop processes to receive project proposals from entities seeking support in accomplishing cross-boundary work.
- Explore ways to better leverage existing authorities, funding, and capacity to increase the pace and scale of cross-boundary projects.
- Identify pathways to create additional capacity across the state to accomplish more work within *Priority Areas for Focused Attention*.
- Identify barriers to accomplishing cross-boundary work and make recommendations to decision making bodies to remove those barriers.
- Increase applicant accessibility to and understanding of information and funding opportunities that facilitate cross-boundary work.
- Encourage consistency in grant management processes among different funding entities to streamline project implementation across jurisdictional boundaries.
- Actively support local government and collaborative group capacity in engaging in cross-boundary coordination.
- Develop, implement, and fund an adaptive management strategy for the *Montana Forest Action Plan*.
- Host regular peer learning sessions to share information on cross-boundary lessons learned. Work in partnership with other entities who conduct similar sessions.
- Facilitate strong partnerships with tribal nations to ensure coordination across sovereign nation boundaries.
- Seek new funding sources for cross boundary restoration work.

SUPPORT LOCALIZED CROSS-BOUNDARY COORDINATION THROUGHOUT THE STATE OF MONTANA.

- Build and strengthen relationships with tribal nations to help facilitate cross-boundary projects that benefit tribal members and surrounding communities.
- Promote the use of cross-boundary decision support tools such as the *Priority Areas for Focused Attention* Interactive Dashboard.
- Promote and support local collaboration efforts through funding, peer-learning, or other identified mechanisms. Work in close partnership with the Montana Forest Collaboration Network, the Montana Watershed Coordination Council, and other organizations to support collaborative engagement at the local level.
- Encourage local cross-boundary coordinating bodies to engage with collaborative groups, tribal nations, local government, and other stakeholders to prioritize work in and around communities.
- Assist local cross-boundary coordinating bodies in developing governance structures and finding capacity to ensure that coordination sustains over time.
- Promote and support the use of authorities and programs developed to increase the pace and scale of forest management and restoration, such as Good Neighbor Authority, Stewardship Agreements and Contracting, Collaborative Forest Restoration Program, Environmental Quality Incentives Program, and Joint Chief's Landscape Restoration Partnership.

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