

**THE PRESIDENT'S BUDGET REQUEST FOR THE
U.S. FOREST SERVICE FOR FISCAL YEAR 2024**

HEARING
BEFORE THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
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THE PRESIDENT'S BUDGET REQUEST FOR THE U.S. FOREST SERVICE FOR FISCAL YEAR 2024

TUESDAY, APRIL 18, 2023

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The Committee met, pursuant to notice, at 10:00 a.m. in Room SD-366, Dirksen Senate Office Building, Hon. Maria Cantwell presiding.

OPENING STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Senator CANTWELL. The U.S. Senate Committee on Energy and Natural Resources will come to order. I am obviously filling in for Chairman Manchin this morning, who expects to be here later today.

I want to thank Chief Moore for being here today. In the last 18 months, Congress has provided you with a more than a quarter of a billion dollar increase in annual appropriations, an additional \$5.4 billion in Bipartisan Infrastructure Law funds, and an additional \$5 billion in funding from the Inflation Reduction Act. These are timely and vital investments. In February, the President's Council of Advisors on Science and Technology issued a report to the President noting that more than 100 million Americans now live in areas that are threatened by wildfires. And as the Government Accountability Office noted last week, between January and October of last year, nearly 60,000 wildfires affected 7.2 million acres of land. GAO noted that the length of the fire season and frequency of fires are increasing, while more people and infrastructure are at risk from these wildfires.

Chief Moore, I know you are excited to discuss the proposed budget and how to meet those challenges. We, too, want to discuss those priorities because fire season is fast approaching. While I am relieved to see that the National Interagency Fire Center has not yet predicted a dangerous fire season for the West, an area facing significant wildfire risk is the Central Washington part of our state. This is home to a very highly productive agricultural part of our state, and I want to better understand how the Forest Service is going to help rural communities in Central Washington prevent and protect and recover from wildfire season.

As we consider the Forest Service budget today, it is important to discuss how the Forest Service is spending historic investments

made last Congress and how additional funding the Administration is seeking would bolster our investments. I would like to start by commending you on the legislative proposal included in your budget to address a number of the problems facing wildland firefighters. I appreciate your setting up a new pay table for these workers, building off the successes of the Bipartisan Infrastructure Law and your stated desire to hire 970 more men and women to fill these roles. As we work through this, I do want to make sure that we are cognizant of what funding it is going to take to make these proposals a reality.

I am told there is not a lot of cushion in the wildfire contingency reserve that we enacted five years ago as part of the fire borrowing fix, and as everyone knows, we wanted to quit borrowing from the fund and actually do the work that would help us prevent some of the fires from being at that catastrophic level. I was commenting to Senator Barrasso and thanking him for him coming to Seattle and us having a subcommittee hearing on wildland firefighting then, after we had seen devastating fires in the same Central Washington part of our state. And so these are very, very important issues. Senators Wyden, Risch, and I, along with others, worked hard to successfully end the practice of fire borrowing, and we must ensure that the Forest Service does not return to that practice of robbing non-fire accounts to cover fire costs.

Lastly, I was surprised and disappointed to see that your proposal did not include anything with regard to your requirements under the Dingell Act to provide firefighters with the best technology for fighting fires and keeping firefighters safe. The Dingell Act, which required Forest Service to equip firefighters with technologies that are meant to prove safety—I see nothing with regard to this requirement in the Forest Service proposal. So we will have a chance to ask in the Q&A about that.

I would like to acknowledge a few other components of your budget proposal that are important to my state. For example, I appreciate this year's budget establishment of a permanent program to fund rehabilitation work after wildfires. The Burned Area Emergency Response Program will be able to provide more resources to areas impacted by wildfire, like those impacted by the Bolt Creek Fire that shut down Highway 2 in Washington last year after the fire burned the mountain slope just above the highway. These are really important areas for keeping communities operating, and in this case, a very vital link between the east and west part of our state, open and moving.

I also appreciate the discussion in your budget about the inventory—the old-growth stands on the national forest. Your proposed investment in outdoor recreation funding is historic. Outdoor recreation employs over 114,000 people in the State of Washington. And according to the Bureau of Economic Analysis, this sector grew by 8.7 percent over the last year. So we love the outdoor economy. It is continuing to grow. And we are working with our colleagues to try to very specifically focus on trail funding. But we are still falling short of what we need to do because these are mini family day trips, mini backpacking adventures that many people come to Washington for and many people in Washington want to enjoy.

So with that, there is a lot to talk about in the Q&A and a lot to hear from our witnesses on.

I will now turn it over to the Ranking Member, Senator Barrasso, for his opening remarks.

And thanks again for your long-stead interest in these issues and paying attention to them and being willing to come to Washington after one of our big, big fire seasons.

**OPENING STATEMENT OF HON. JOHN BARRASSO,
U.S. SENATOR FROM WYOMING**

Senator BARRASSO. Well, thank you very much, Madam Chairman. Thank you for today's hearing on the Forest Service budget request. Chief Moore, welcome back to the Committee. Glad to have you here today. We are looking forward to hearing how the proposed budget intends to further the critical mission of the agency.

I am pleased with some of your priorities within the budget request. For example, there is funding to protect our forests from catastrophic fire, as the Chairman just said. Providing badly needed pay increases to our brave firefighters. We have a number of them here with us today. I also do have some significant concerns.

In the last two years, Congress has provided over \$10 billion additional dollars to the Forest Service. The budget proposes massive increases in new spending. You know, your request for \$7.4 billion in discretionary appropriations would amount to a 52 percent increase over current funding levels. In an era of historic budget deficits, the Forest Service really needs to prioritize.

To be clear, the Forest Service faces enormous challenges in the fight against wildfires. One-third of our national forests are at serious risk of being consumed by catastrophic fires. There is broad agreement among members of this Committee, both sides of the aisle, that the historic forest fire treatment levels are historically and totally inadequate to meet the challenge. While I support robust funding for the efforts, I am not convinced that we can simply just spend our way out of problems that have plagued the forest for decades. The Forest Service needs to fully embrace efforts to streamline its processes for approving projects that improve forest health. The agency needs to more aggressively defend against harmful litigation that prevents projects from moving forward. Far too often, when extreme environmental groups sue, vital wildfire reduction projects get tied up in the courts and don't get accomplished.

I am also deeply troubled by what appears to be the intentional exclusion of Wyoming from major Forest Service initiatives aimed at reducing wildfire risk. In its ten-year strategy to combat the wildfire crisis, the agency has announced significant spending across 21 designated areas. These dollars fund projects that are critical for reducing wildfire risk and defending America's forests. They are going to protect people's lives and livelihoods. Inexplicably, Wyoming is the only state located on or west of the Rocky Mountains that has not received funding under this strategy—the only state—of all of those. Further, Wyoming is the only western state to be excluded from the Wildland Fire Mitigation and Management Commission. This is a commission created by Con-

gress to help improve strategies to prevent, to manage, to suppress, and to recover from wildfires. That is why in March of last year, I, along with the rest of the Wyoming delegation, sent a letter specifically requesting that Wyoming be represented on the commission. Here we are a year later. Wyoming is still not represented. This is a pattern of neglect that simply must change.

[The letter referred to follows:]

Congress of the United States
Washington, DC 20515

March 24, 2022

The Honorable Deb Haaland
Secretary
U.S. Department of the Interior
1849 C Street, N.W.
Washington D.C. 20240

The Honorable Tom Vilsack
Secretary
U.S. Department of Agriculture
1400 Independence Avenue, S.W.
Washington D.C. 20250

The Honorable Alejandro Mayorkas
Secretary
U.S. Department of Homeland Security
3801 Nebraska Avenue N.W.
Washington D.C. 20016

Dear Secretary Haaland, Secretary Vilsack, and Secretary Mayorkas:

We write in regard to the Wildland Fire Mitigation and Management Commission selection process. Specifically, we write in support for representation for our states, Idaho and Wyoming.

As you are aware, the Infrastructure Investment and Jobs Act (IIJA) authorized the establishment of the Wildland Fire Mitigation and Management Commission. The Commission is intended to assist in the creation of new, more effective, federal wildfire mitigation and prevention policy, and it will also be helpful in funneling resources to states. It is important for “high-risk” wildfire states to have a venue to provide their expertise and concerns.

The IIJA defines “high-risk” as “*a State that, during not fewer than 4 of 5 years preceding the date of enactment of this Act, received fire management assistance under section 420 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act; or included in an area for which the President declared a major disaster for fire in accordance with section 401 of that Act.*” Unfortunately this definition, while well meaning, excludes both Idaho and Wyoming from the “high-risk” category for Commission representation.

By any other measure, both states are certainly at high risk of wildfire. Like the rest of the West, Idaho and Wyoming have continuously suffered through the trend of hotter, longer, and more catastrophic fire seasons as drought, labor shortages, and a host of other conditions negatively impact firefighting strategies. In 2021, Idaho’s fire season burned 439,600 acres from 1,332

fires—a mild season compared to what has become a norm in the state¹. In 2012, a record 1.7 million acres burned in Idaho². In 2020, Wyoming experienced nearly 340,000-burned acres, a land area larger than Grand Teton National Park³. These are small demonstrations of the extreme risk both states face annually.

This definition of “high-risk” excludes Idaho and Wyoming when applications from several states which have experienced fewer fires and fewer burned acres will be prioritized⁴. With this in mind, we respectfully request that both Idaho and Wyoming be represented on the Wildland Fire Mitigation and Management Commission.


Thank you for your prompt attention to this request.

Sincerely,



James E. Risch
United States Senator


John Barrasso, M.D.
United States Senator


Mike Crapo
United States Senator


Cynthia M. Lummis
United States Senator


Mike Simpson
Member of Congress


Liz Cheney
Member of Congress


Russ Fulcher
Member of Congress

¹ https://www.predictiveservices.nifc.gov/intelligence/2021_statsumm/annual_report_2021.pdf

² <https://www.idahostatesman.com/news/local/environment/article254616092.html>

³ https://www.predictiveservices.nifc.gov/intelligence/2020_statsumm/annual_report_2020.pdf

⁴ https://www.predictiveservices.nifc.gov/intelligence/2021_statsumm/fires_acres21.pdf

Senator BARRASSO. Much like other western states, Wyoming is highly vulnerable to wildfires. According to the Forest Service estimates, more than four million acres of Wyoming forests are at either high or very high risk to catastrophic wildfires. And we have seen the tragic results of the failure to properly manage these acres. In four of the past five years, Wyoming has been hit by numerous destructive fires. In 2020 alone, we experienced nearly 340,000 burned acres. Now, that is a land larger than a third of the entire area of the President's home State of Delaware. We are talking about a large area of land.

Today, our communities remain in harm's way. According to the Forest Service website, *wildfirerisk.org*, towns in Wyoming, like Dubois, Jackson, Buffalo, Lander, and Saratoga are all at high risk to destructive wildfires. I believe the people of Wyoming deserve better protection. And at the very least, they deserve the same protections that every other western state is getting.

Thanks so much, Madam Chairman. I look forward to the questioning and hearing today.

Senator CANTWELL. Chief Moore, welcome. Again, thank you for being here. We look forward to your testimony.

**STATEMENT OF RANDY MOORE, CHIEF, U.S. FOREST SERVICE,
U.S. DEPARTMENT OF AGRICULTURE; ACCOMPANIED BY
MARK LICHTENSTEIN, DIRECTOR OF STRATEGIC PLANNING,
BUDGET, AND ACCOUNTABILITY, U.S. FOREST SERVICE**

Mr. MOORE. Thank you, and Chairwoman Cantwell, Ranking Member Barrasso, and members of the Committee, thank you for inviting me to testify before you today. I appreciate the opportunity to share how the Forest Service is putting America's money to work. The FY24 request focuses on three primary areas: modernizing the wildland fire management system, confronting the wildfire crisis, and ensuring equitable access to and benefits from the National Forest System.

The people we serve deserve nothing less than to see the value of their money at work for their benefit. National forests and grasslands cover about 193 million acres, some 180 million people, and over 68,000 communities, and they rely on these lands to capture and filter that drinking water. Our work contributes to over 373,000 jobs and \$40.3 billion to the GDP. We work with tribes, states, and local governments, private landowners, and many other partners across the country to keep forests and grasslands healthy and safe. Today, America's forests face dire threats from wildfire, climate change, and insects and disease, especially in the West. This is an emergency situation in many places and we are acting with a sense of urgency in collaboration with communities and our partners. Our top priority is to reduce the wildfire threats by safeguarding communities and critical infrastructure and create a healthy, resilient forest.

Through our wildfire crisis strategy, we have ramped up to treat the right places at the right scale using an all-hands, all-lands approach. This past January, we announced investments of \$930 million in 21 high-risk landscapes in the West, benefiting roughly 200 communities and many other resources that people value. In addition to this, we have awarded nearly \$200 million in Community

Wildfire Defense Grants toward 100 projects to 22 states and seven tribes, including to the Crooked Creek Community Fuels Mitigation Project in Wyoming. Recent investments by Congress give us a historic opportunity to take bold and strategic action. We are working to do just that, to put every dollar to good use.

We are grateful to Congress, and this Committee in particular, for investing foundational funding to do this work. Sustained execution depends on continued federal investments. The proposed FY24 budget responds to this need. This budget also calls for a \$1.4 billion investment in salaries, health, safety, and well-being for firefighters. A suite of new actions will permanently increase pay, improve options for housing, and provide better care and support for physical and mental health. It also increases the number of firefighters.

While firefighters represent the backbone of our wildfire system, we also need active and aggressive land management to confront the wildfire crisis. This budget invests \$300 million in hazardous fuels treatments. It supports execution of the wildfire crisis strategy. It targets investments in burned area rehabilitation for \$56 million to expedite recovery from wildfire. It supports use of the latest research and grants to universities to support educational and technical assistance for innovative wood products, including a recent award to West Virginia University for the conceptual design of the first mass timber building using hardwood.

National forests and grasslands belong to every American. We are grateful for the Great American Outdoors Act funds that helped to reduce our \$7.7 billion maintenance backlog and ensure public access. Every person should feel a personal invitation and connection to these lands. We remain committed to removing barriers so all people can enjoy National Forest System lands and services, particularly tribal and underserved communities. We continue to focus policies, accountability, and training to ensure an equitable, respectful, and harassment-free workforce. We know what's at stake if we don't address the effects of climate change and the wildfire crisis, the health of our forests and communities, clean water, a vibrant wood products industry, and jobs and resources that Americans depend on. We need to act now to meet the challenges before us.

Thank you. I am grateful for your support, and I welcome your questions.

[The prepared statement of Mr. Moore follows:]

**Statement of Randy Moore, Chief of the USDA Forest Service
Before the United States Senate Committee on Energy and Natural Resources
Concerning the President's Fiscal Year 2024 Proposed Budget
For the USDA Forest Service
April 18, 2023 10:00 a.m.**

Chair Manchin, Ranking Member Barrasso, and members of the Committee, thank you for inviting me here today to testify on the President's fiscal year (FY) 2024 Budget request for the U.S. Department of Agriculture (USDA), Forest Service.

The fiscal year 2024 President's Budget for the USDA Forest Service discretionary appropriations totals \$7.4 billion for base programs and \$2.3 billion for the wildfire suppression cap adjustment (in the Wildfire Suppression Operations Reserve Fund). The fiscal year 2024 request focuses on three primary areas: modernizing the wildland fire management system; confronting the wildfire crisis; and ensuring equitable access to and benefits from the National Forest System.

The investments highlighted below reflect services the Forest Service delivers through work on National Forests, partnerships with State, Private, and Tribal landowners, and our Research and Development mission area. These investments enable the Forest Service to restore long-term forest health and resiliency across landscapes the American people rely-on while ensuring equitable access to the resources on National Forest lands. Alongside our partners, the Forest Service will continue to reduce the risk of catastrophic wildfires to communities in FY 2024 through investments in the highest priority landscapes identified within the Wildfire Crisis Strategy. The Forest Service will maximize every dollar invested into our agency, making every dollar work for the American people. The people we serve deserve nothing less than to see the value of their money at work for their benefit.

The President's FY 2024 Budget Request for Specific Priorities to Support Focal Areas

The following investments align with and enhance the agency's efforts to modernize the wildland fire management system:

- **\$1.4 billion for Wildland Fire Management Salaries and Expenses:** Investing in our wildland firefighting workforce is a matter of national security as critical infrastructure, homes, communities, structures, and natural resources are at grave and growing risk of catastrophic wildfire. The FY 2024 budget funds a permanent increase in pay for the wildland firefighter workforce, providing a more livable wage, enhancing recruitment, and supporting retention. Specifically, this request includes:
 - \$180 million for increasing base pay for federal wildland firefighters to ensure that this crucial workforce does not face a pay cliff at the end of this year
 - \$69 million to support cost of living increases for FY 2024
 - \$259 million for increasing federal firefighting capacity (an estimated 970 additional federal firefighters and personnel) to expand our ability to address the wildfire crisis and reduce the strain on our current workforce

- \$10 million for vital health and well-being assistance to more comprehensively support our wildfire firefighter workforce;
- \$50 million to address the urgent need for wildland firefighter housing through necessary maintenance and repairs of Forest Service housing units that will support our recruitment, hiring, and retention efforts.
- **\$323 million for Hazardous Fuels Reduction:** To mitigate wildfire risk on 4.2 million acres in high priority and high-risk fire sheds, building on hazardous fuels funding from the Bipartisan Infrastructure Law and Inflation Reduction Act and aligned with the agency's 10-Year Wildfire Crisis Strategy.

The following investments ensure that national forests and grasslands continue to provide experiences, services, and products to the American public by focusing on the restoration, enhancement, and resilience of the Nation's forests and grasslands:

- **\$56 million for the Burned Area Rehabilitation:** to build on capacity created with the \$65 million per year seed money from the Bipartisan Infrastructure Law to rehabilitate burned areas and free up existing funding for more proactive forest health work.
- **\$94 million for Recreation, Heritage, and Wilderness:** to increase support of critical recreation operations, planning, services, and improvements, with particular emphasis on creating welcoming, sustainable, and equitable recreation opportunities for all Americans with a focus towards underserved and Tribal communities.
- **\$50.5 million for Vegetation and Watershed Management:** to support healthy and resilient watersheds and landscapes, sustain the production of clean and abundant air and water, assist with meeting the Administration's climate goals, and contribute to healthy and productive communities and Tribal Nations.
- **\$45 million for Minerals and Geology Management:** to locate and prioritize orphaned oil and gas wells for remediation and the inventory, environmental analysis, and clean-up of mine reclamation sites.
- **\$7.8 million for Grazing Management:** to support post-fire restoration, provide for strategic incentives to grazing permittees, and build vibrant rural economies.
- **\$55 million for Forest Health Management:** to ensure healthy forests and functional landscapes on federal and non-federal lands in support of the conservation priorities of the Administration.
- **\$80 million for Collaborative Forest Landscape Restoration Program:** to invest in communities and regions with a collaborative, common purpose in reducing wildfire risk and improving forest health and resiliency.
- **\$1.7 billion for National Forest System Salaries and Expenses:** to support the agency's 10-Year Wildfire Crisis Strategy as well as critical non-fire programs, which have decreased in funding over time as wildland fire response needs escalated.

Further investments ensure that the Forest Service relies on the latest science and technology to deliver results on the ground and for the people:

- **\$502 million for Information Technology Capabilities:** to continue

modernization of our Information Technology systems that allow the public to better access our services, sustain emergency communication systems, and provide our workforce the tools they need to carry out our conservation mission safely and efficiently.

- **\$72 million for Zero Emissions Vehicles:** included across several program funding requests to invest in replacing vehicles within the agency fleet and to provide for employees and visitors with charging infrastructure.
- **\$349 million for Forest and Rangeland Research:** to continue investments in research priorities, with a focus on climate change-related research including reforestation, carbon accounting, and fire and fuels research.
- **\$6 million for USDA Climate Hubs:** to accelerate science production and technology transfer that will aid management agencies, private landowners, and agricultural producers adopt scientifically sound climate adaptation practices.

Confronting the Wildfire Crisis

The Forest Service's paramount focus continues to be combatting the threat and impact of destructive wildfire to our nation's communities, critical infrastructure, forests, rangelands, water supplies, and wildlife. Changing environmental conditions have lengthened fire seasons into fire years and worsened wildfires across the West. Expanding development into the wildland/urban interface (WUI) increasingly puts more homes into fire-prone landscapes and increases the challenge and complexity of wildfire suppression and fuels reduction work. Most wildfires that cause significant damage to a large number of homes and other structures are human caused; 97% of wildfires threaten homes; and almost one-third of American homes are within the WUI.

The Forest Service has a historic opportunity now, between the investments from the Bipartisan Infrastructure Law, the Inflation Reduction Act, and our annual appropriations, to implement solutions at a large scale. We are now entering our second year of carrying out our 10-Year Wildfire Crisis Strategy. The Wildfire Crisis Strategy aims to increase science-based fuels treatments by up to four times previous treatment levels, especially in those areas at highest risk. By working in the right places at the right scale, our treatments can reduce wildfire risk and better protect communities, infrastructure, and natural resources while helping wildland firefighters respond to wildfires safely and effectively.

The Forest Service cannot succeed in this alone. The highest risk firesheds are typically in multiple land ownerships. The Forest Service will continue to strengthen our long-standing work and relationships with Tribes, States, local communities, private landowners, and other stakeholders to adapt lessons learned into a coordinated and effective program of work as outlined in the 10-Year Wildfire Crisis Strategy. Through government-to-government consultation with Tribes, expanded partnerships and co-stewardship, and broader community support, the Forest Service will increase the use of prescribed fire, fuel treatments, and the management of unplanned ignitions to reduce long-term wildfire risks. Fortunately, we have decades of experience working through collaborative partnerships based on common values and shared goals across shared landscapes as set out in the National Cohesive Wildland Fire

Management Strategy.

Ensuring Equitable Access to and Benefits from the National Forest System

The Forest Service will continue to invest in actions that create broad and efficient access to the vital resources our forests and grasslands provide. This effort is twofold. First, we must ensure that those who rely on these services and benefits can access those benefits safely. Therefore, we are committed to improving the operation and maintenance of our extensive infrastructure portfolio that includes buildings, dams, communication sites, recreation sites, roads, trails, and bridges. Second, to carry out this work effectively, the Forest Service is committed to continued intentional internal and external engagement with Tribal Nations whose ancestral homelands are within or adjacent to federally managed public lands, and communities that live by, visit, and depend on national forests. The Forest Service is committed to identifying and removing barriers to access Forest Service programs and services for historically underserved communities. This will be done by integrating equity-centered criteria in the design, funding, and prioritization of all policies, programs, and activities to center equity considerations as part of the decision process. The Forest Service will also work to advance mission critical work, remove barriers and boost economic opportunities through improved access to contracts, grants and agreements, and permits.

Leveraging Additional Funding Authorities

Along with the tools and investments proposed in the FY 2024 Presidents Budget, the Forest Service will leverage funding within the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA) to confront the wildfire crisis, create new markets and technology for wood products, promote economic development, and restore forest health and resiliency through partnerships and collaboration across landscapes.

Through the Bipartisan Infrastructure Law (BIL), Congress provided a \$1.4 billion down payment that greatly assists in putting our Wildfire Crisis Strategy into action with investments on ten landscapes in eight Western States (Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, and Washington). Through work on these landscapes and others, we completed treatments on 3.2 million acres nationally in 2022. We also accomplished these treatments in 118 of the 250 high-risk firesheds identified in the Wildfire Crisis Strategy. This work was accomplished despite numerous challenges including workforce capacity and high post-fire workloads from historic wildfire activity across the country the past several years. The work on these acres directly reduced risk to communities, infrastructure, and critical watersheds.

The Inflation Reduction Act provides the Forest Service an additional \$1.8 billion for hazardous fuels funding in the WUI. With IRA funding, we recently selected 11 additional landscapes for treatment in seven Western States (Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington). Combined with the initial BIL investment landscapes, our actions will span nearly 45 million acres across 134 of the 250 high-risk firesheds in the western U.S., with a total investment to date of \$930 million on 21 landscapes in 2023. These investments will help reduce the risk of wildfire to at-risk communities, Tribal lands, critical infrastructure, utility corridors, and public water sources. We listened to our partners, the public we serve, Tribes and many others regarding what mattered most to them, where opportunity is, and where

challenges remain. Their feedback and our experience on these landscapes helped us identify both challenges to implementation and enabling conditions for future success.

Through Great American Outdoors Act (GAOA) (P.L. 116-152) funding for the National Parks and Public Land Legacy Restoration Fund, the Forest Service continues to repair and upgrade vital infrastructure and facilities in the national forests and grasslands. The GAOA also permanently funds the Land and Water Conservation Fund (LWCF), with which the Forest Service invests in conservation and recreation opportunities in public and private lands through the Forest Legacy Program and Federal Land Acquisition.

Forest Service projects will support about 3,500 jobs and contribute \$350 million to the GDP on an average annual basis over the 5-year authorization of the GAOA National Parks and Public Land Legacy Restoration Fund. In FY 2024, the Forest Service proposes \$94.3 million for the Forest Legacy Program, \$123.9 million for Federal Land Acquisition, and \$285 million for the National Parks and Public Land Legacy Restoration Fund. The FY 2024 project lists are included in the FY 2024 Budget request.

In closing, the President's FY 2024 Budget request for the Forest Service proposes a landmark investment in wildland fire, establishes funding priorities for risk-based wildfire reduction, and improves overall access and utilization of our National Forests System. The FY 2024 Budget request underscores our commitment to long-overdue investments in our wildland firefighter workforce to provide them with the compensation that they deserve, along with critical investments to support health and wellbeing, and expanded options for housing. The FY 2024 Budget also highlights the importance of restoring and creating resilient landscapes, improving infrastructure, and removing barriers to access. We look forward to working with this Subcommittee to fulfill the President's goals and our key responsibilities for the long-term benefit of the Nation's forests and grasslands, and for all Americans. I will be glad to answer your questions.

Senator CANTWELL. Thank you.

Mr. Lichtenstein, are you making a statement?

Mr. LICHTENSTEIN. No, ma'am.

Senator CANTWELL. Just here to take the hard questions.

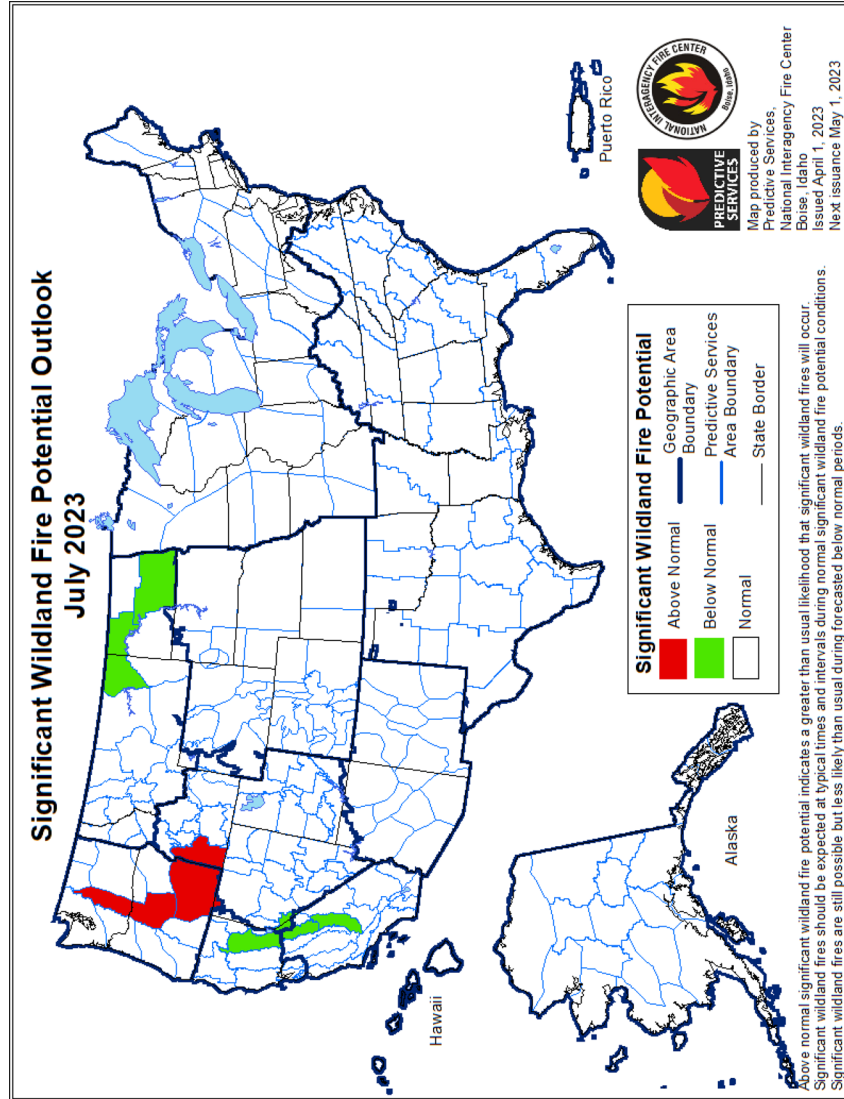
Mr. LICHTENSTEIN. Yes, indeed.

Senator CANTWELL. Okay, all right.

Well, let's get started.

I wanted to start with this year's fire season question. The Forest Service has put out an announcement that might make most parts of Washington feel pretty good about what is happening, but the central part of our state, which is a very big Ag economy—\$2 billion worth of agricultural products—seems to be right in the epicenter of what people are saying will be the hot spot. You might put the whole map up for the rest of the U.S. Okay.

[The map referred to follows:]



Senator CANTWELL. So again, definitely, my colleague from Oregon, I am sure will show up and communicate about what this forecast is showing for Oregon, but you know, we have a very big apple, pears, hops, cherries, wine industry in this part of the United States. So we really want to know about your workforce and firefighting budget. Right now, firefighters have to work hundreds of hours of overtime, and how is your proposed increase going to help us address what we are facing here in the central part of Washington and in Oregon?

Mr. MOORE. So Chairwoman Cantwell, that was about three questions into one and so I will try to address them——

Senator CANTWELL. Well, I have three more.

[Laughter.]

Senator CANTWELL. Because I really want to ask you the inventory of old growth. I want to ask you why you have not implemented the technology, and definitely want to ask you about, you know, the trails issue. But for now, I am just, I am really giving you a softball, which is, you want more people. I am saying you want more people.

By the way, I want to recognize that we have a bunch of firefighters here, particularly from the Mount Baker-Snoqualmie Forest. So thank you for being here. Thanks for what you guys—I noticed when I talked about Bolt Creek, they were nodding because they know how bad that fire—literally caused a problem with shutting down Highway 2. So these are really integral day to day. So what can we do on the workforce side to make sure that we have the personnel here and ready to fight this fire season?

Mr. MOORE. Yes. Excellent question. So as we approach the busiest part of the fire year, 2023, for this year, the Forest Service is really aspiring to have about 11,300 firefighters on board. You know, we know that we need additional capacity, which is why we are requesting additional capacity in the FY24 President's budget. And we are requesting funding for an additional 970 firefighters and support personnel. This really reinforces the need to enact pay, housing, mental health, and other reforms proposed in the FY24 President's budget to effectively recruit and retain wildland firefighters. Housing is a really big issue, and it is an issue of availability, but also affordability. And so we are working feverishly to work with Congress and we would be happy to follow up with you to look at some options that we are currently trying to explore, but to also look to see and work together on other options that we might want to pursue. But it is a significant issue, not only in recruitment of firefighters, but retention of firefighters.

Senator CANTWELL. Great. Well, I think what we would like, and maybe Mr. Lichtenstein can add some value to this and get us an answer, but I talked to my state and I am sure you have statistics about what we are seeing as an increase in fire season—the risk, the burn, the damage, the economic impact. And so I think we can put that into some sort of percentage, and if you say you don't have the workforce to combat it, this is how much more challenging it will be. And so I guess that is what we are looking for, but we will come back on that.

On the Dingell Act, on the technology side, I noticed the President's Council of Advisors on Science and Technology issued a re-

port, “Modernizing Wildland Firefighting To Protect Our Firefighters,” and the President’s Council’s quote was that the report highlights “immediate needs that can be addressed with existing technology, and strategic, long-term investments in new science and technology to ensure that our firefighters do not have to face tomorrow’s fires with yesterday’s tools. ”

[The PCAST report referred to follows:]



REPORT TO THE PRESIDENT

**Modernizing Wildland Firefighting to
Protect Our Firefighters**

Executive Office of the President
President's Council of Advisors on
Science and Technology

February 2023



About the President's Council of Advisors on Science and Technology

The President's Council of Advisors on Science and Technology (PCAST) is a federal advisory committee appointed by the President to augment the science and technology advice available to him from inside the White House and from the Federal agencies. PCAST is comprised of 30 of the Nation's thought leaders, selected for their distinguished service and accomplishments in academia, government, and the private sector. PCAST advises the President on matters involving science, technology, and innovation policy, as well as on matters involving scientific and technological information that is needed to inform policy affecting the economy, worker empowerment, education, energy, the environment, public health, national and homeland security, racial equity, and other topics.

For more information about PCAST see www.whitehouse.gov/pcast.

EXECUTIVE OFFICE OF THE PRESIDENT
PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20502

President Joseph R. Biden, Jr.
The White House
Washington, D.C.

Dear Mr. President,

More than 100 million Americans now live in areas threatened by wildfires. The risk of catastrophic wildfires is growing at alarming rates in the West and the South, with disproportionate impacts on low-income and rural communities as well as communities of color. Your Administration has already taken important steps to prioritize community resilience to wildfires within a broader effort to prepare the American people for present and future impacts of climate change.

PCAST has sought to complement those efforts by focusing specifically on the role that science and technology can play in supporting our wildfire first-responders: the tens of thousands of state and federal wildland firefighters as well as thousands of additional local firefighters who risk their lives protecting the American people, property, and infrastructure from the devastating impacts of wildfires. With your encouragement during our meeting at the White House last summer, we have engaged extensively with dozens of wildland firefighters, from frontline hand crews and smokejumpers to incident commanders and resource allocators. Their perspectives have been complemented by discussions with subject matter experts throughout the federal government, the private sector, and academia.

Based on this outreach, we see exciting new opportunities to make the job of wildland firefighting safer and more effective. The recommendations that follow in this report highlight immediate needs that can be addressed with existing technology, and strategic, long-term investments in new science and technology to ensure that our firefighters do not have to face tomorrow's fires with yesterday's tools.

The needs of our wildland firefighters overlap substantially with those of America's warfighters. Whereas we have a national commitment ensuring that our warfighters are not sent into harm's way without the best of American science and technology at their disposal, no similar organizational framework exists to protect and empower wildland firefighters. We recommend that you establish a new joint executive office with Cabinet-delegated authorities to implement a unified S&T strategy for wildfires, similar to the joint strategies that have been achieved for national defense.

These recommendations can only deliver their full potential with your Presidential action designating a clear, empowered, and accountable leader to drive them forward throughout the federal government, e.g., via the proposed new joint-agency executive office. Our success confronting the wildfire challenge can demonstrate the possibilities enabled by science and technology to improve the lives of the American people and provide global leadership in confronting the impacts of climate change.

Sincerely,

The President's Council of Advisors on Science and Technology

The President's Council of Advisors on Science and Technology

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Executive Summary

The linchpin of our country's effort to combat wildfires is a dedicated corps of tens of thousands of state and federal wildland firefighters, who risk their lives to defend over 1.5 billion acres of fire-prone land in the United States.^{1,2} Thousands of additional local firefighters are also called upon to protect communities at the wildland urban interface,³ areas that now collectively house nearly one-third of the U.S. population.⁴ PCAST aims to identify opportunities for science and technology to make the job of wildland firefighting safer and more effective. Progress in this arena can complement and amplify actions already taken by the Biden-Harris Administration to strengthen the firefighting workforce via enhancements to job salary and classification levels⁵ and the 14% increase in wildland fire suppression and prevention funding included in the Fiscal Year (FY) 23 Omnibus Appropriations Law.⁶ Our recommendations highlight immediate needs that can be addressed with existing technology as well as strategic, long-term investments in new science and technology to ensure that our firefighters do not have to face tomorrow's fires with yesterday's tools.

Forest management and similar long-term investments in wildfire prevention are also critically essential to reducing the burden on firefighters in the future. But technology needed to improve wildfire response is ready to help today. Hence, in this report we have intentionally trained our focus on critical aspects of wildfire response that are stuck—technologically and organizationally—in the last century. Several actions recommended in this report can be taken immediately to support the needs of today's wildland firefighters and vulnerable communities nationwide, as we also pursue the longer-term actions recommended here that can ensure an enduring focus on wildland firefighting science and technology development for decades to come.

¹ National Association of State Forestry (NASF) State Forestry Statistics Survey. (2021). *State Foresters by the Numbers*. <https://www.stateforesters.org/wp-content/uploads/2022/01/2020-State-Foresters-by-the-Numbers-01272022.pdf>

² The White House. (2022, July 28). *The Biden-Harris Administration Continues Efforts to Address Growing Wildfire Threat [Fact sheet]*. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/07/28/fact-sheet-the-biden-harris-administration-continues-efforts-to-address-growing-wildfire-threat/>

³ U.S. Fire Administration. (2022). Wildland Urban Interface (WUI): A Look at Issues and Resolutions. <https://www.usfa.fema.gov/downloads/pdf/publications/wui-issues-resolutions-report.pdf>

⁴ Radeloff, V. C., Helmers, D. P., Kramer, H. A., Mockrin, M. H., Alexandre, P. M., Bar-Massada, A., Butsic, V., Hawbaker, T. J., Martinuzzi, S., Syphard, A. D., & Stewart S. I. (2018). Rapid growth of the US wildland-urban interface raises wildfire risk. *PNAS*, 115(13), 3314–3319. <http://dx.doi.org/10.1073/pnas.1718850115>

⁵ The White House. (2022, June 21). *The Biden-Harris Administration Announces New Pay Raises & Supports for Wildland Firefighter Workforce from Bipartisan Infrastructure Law [Fact sheet]*. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/21/fact-sheet-biden-harris-administration-announces-new-pay-raises-supports-for-wildland-firefighter-workforce-from-bipartisan-infrastructure-law/>

⁶ Committee on Appropriations, Chairman Patrick Leahy. (2022). *Fiscal Year 2023 Omnibus Appropriations Bill: Highlights*, 5. <https://www.appropriations.senate.gov/imo/media/doc/HIGHLIGHTS%20DOCUMENT%20FY%2023.pdf>

Recommendations

- **Recommendation 1: Given the vulnerabilities and shortfalls in wildland firefighter communications, connectivity, and technology interoperability, immediately assess, adapt, and field currently available technologies.** Technologies such as mobile area networks are now commonly used in the commercial and defense sectors, and they can enhance communications in terrain that is especially challenging and dangerous for wildfire response. U.S. Department of Agriculture (USDA) and Department of Interior (DOI) should also develop a program to begin training all federal wildland firefighters on the use of the new technologies immediately. Staff within the National Interagency Fire Center (NIFC) could lead these efforts if allocated a significant increase in their personnel and budget capacity to identify improvements in communications concepts, technology, and delivery systems to support wildland firefighter stakeholders. NIFC could lead the effort with support from National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), Federal Communications Commission (FCC), and Federal Aviation Administration (FAA).
- **Recommendation 2: Reverse the current trend of rapidly growing wildfire suppression costs by establishing a joint-agency executive office (hereafter Joint Office) that can accelerate enterprise-level development and deployment of new technologies that enhance situational awareness and initial attack capabilities.** This Joint Office would serve to advance coordination, streamline authorities, and drive progress in enabling technology adoption across the numerous federal agencies with equities for wildland firefighting science and technology (S&T) within NIFC. It is imperative that the Joint Office leader have Cabinet-delegated decision-making authorities as well as the mandate and budget needed to develop and execute a unified technology roadmap. Once operational, the Joint Office could assume responsibility for activities in Recommendations 3 through 5 below.
- **Recommendation 3: Strengthen the full operational sequence of wildland firefighting—detection, alert, response, and suppression—by assessing existing technologies available within the federal arena, the private sector, and allied nations that could be integrated at each stage.** This assessment should establish clear priorities and develop an all-agency roadmap for testing and transition into operations. In addition to the information technologies identified in Recommendation 1, this broader assessment should identify existing technologies, such as uncrewed aerial and ground vehicles, commercial satellite data feeds, field sensors, wildland-urban interface firefighting simulation training, and personal protective equipment that can enhance the safety and effectiveness of wildland firefighting. We recommend that the U.S. Fire Administrator lead this effort until the above-mentioned Joint Office is established. The U.S. Fire Administrator could be supported by other government agencies, including, but not limited to NASA, in assessing current technologies that would help validate the technology roadmap.
- **Recommendation 4: Accelerate improvement of predictive wildfire modeling tools by expanding research community access to archived satellite data from defense and other government sources.** Effective AI modeling of wildfire spread based on terrain, vegetation cover, soil moisture, wind, and other factors is within our grasp, but only with much broader access to abundant historical data—some of which exists in defense archives but is currently classified. We recommend that the Department of Defense (DoD), with the support of partners in the intelligence community, NOAA, and NASA, lead a review of the classification level of the archived data.

- **Recommendation 5: Expand our nation's wildfire response capacity by encouraging development and field demonstration of prototype autonomous detection, assessment, and containment systems for wildland fire.** Uncrewed aerial vehicles and other autonomous systems are poised to be able to dramatically increase our nation's wildfire response capacity, especially at a fire's incipient stages, while also providing new means to protect firefighters on the scene of active wildfires. Emerging private sector efforts can be dramatically accelerated in partnership with federal agencies. One key facet of this task will be to develop a cross-jurisdictional regulatory and operations framework and concept of operations governing land access, aircraft and airspace operations, and other operational factors. We recommend that the Aeronautics Research Mission Directorate within NASA lead this effort until the Joint Office is established, in close coordination with DOI, the United States Forest Service (USFS), and the FAA. NASA could also help to develop and assess technology prototypes for eventual transition to respective organizations and industry.

Modernizing Wildland Firefighting to Protect Our Firefighters

Introduction

Wildfires are a severe and growing threat to American lives, property, and infrastructure. The confluence of a changing climate, urbanization, and constraints on forest management has added urgency to the need to enhance our strategy to address this threat. The Biden-Harris Administration has taken key steps to marshal a whole-of-government response to wildfires.^{7,8,9,10,11} These efforts have focused on protecting the communities most vulnerable to wildfires, reducing wildfire frequency and severity through more effective land management, and supporting firefighters through increased wages and additional mental and physical health resources. The Executive actions, along with historic investments made possible by the American Rescue Plan (ARP), Bipartisan Infrastructure Law (BIL), and Inflation Reduction Act (IRA), have created the foundation for what can develop into an enduring national resilience to wildfires.

To strengthen these efforts, PCAST has identified opportunities for science and technology to make the job of wildland firefighting safer and more effective. Indeed, the linchpin of our country's effort to combat wildfires is a dedicated corps of tens of thousands of state and federal wildland firefighters, who risk their lives to defend over 1.5 billion acres of fire-prone land in the United States.^{12,13} In the words of one fire chief:

"We fight fire with humans on the ground and hand tools primarily. Some are squirting water, some are swinging axes...We are nowhere near a technological solution to the human aspect...Either work on solving that at some point...or

⁷ The White House. (2022, July 28). The Biden-Harris Administration Continues Efforts to Address Growing Wildfire Threat [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/07/28/fact-sheet-the-biden-harris-administration-continues-efforts-to-address-growing-wildfire-threat/>

⁸ U.S. Fire Administration. (2022). Wildland Urban Interface (WUI): A Look at Issues and Resolutions. <https://www.usfa.fema.gov/downloads/pdf/publications/wui-issues-resolutions-report.pdf>

⁹ Executive Order 14008, 86 FR 7619 "Executive Order on tackling the climate crisis at home and abroad," (January 27, 2021). <https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad>

¹⁰ White House Briefing Room. (2021). The Biden-Harris Administration Acts to Address the Growing Wildfire Threat [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/30/fact-sheet-the-biden-harris-administration-acts-to-address-the-growing-wildfire-threat>

¹¹ White House Briefing Room. (2022). The Biden-Harris Administration Announces New Pay Raises & Supports for Wildland Firefighter Workforce From Bipartisan Infrastructure Law [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/21/fact-sheet-biden-harris-administration-announces-new-pay-raises-supports-for-wildland-firefighter-workforce-from-bipartisan-infrastructure-law/>

¹² National Association of State Forestry (NASF) Statistics Survey. (2021). State Foresters by the Numbers. <https://www.stateforesters.org/wp-content/uploads/2022/01/2020-State-Foresters-by-the-Numbers-01272022.pdf>

¹³ The White House. (2022, July 28). The Biden-Harris Administration Continues Efforts to Address Growing Wildfire Threat [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/07/28/fact-sheet-the-biden-harris-administration-continues-efforts-to-address-growing-wildfire-threat/>

*focus on how you can help the tired, dirty, hungry, firefighter who's been up for 36 hours do his or her job better."*¹⁴

PCAST aims to address both immediate and long-term needs embodied in this call. In the process of developing our recommendations, we have engaged extensively with dozens of wildland firefighters, from frontline hand crews and smokejumpers to incident commanders and resource allocators. Their perspectives have been complemented by discussions with subject matter experts from state fire authorities and more than a dozen federal agencies; current and former defense and intelligence community personnel; researchers from academia and national laboratories; and additional stakeholders from philanthropic and other civilian organizations. Our recommendations highlight immediate needs that can be addressed with existing technology, and strategic, long-term investments in new science and technology to ensure that our firefighters do not have to face tomorrow's fires with yesterday's tools.

These recommendations cannot deliver their full potential without Presidential action designating a clear, empowered, and accountable leader to drive them forward. A 2015 assessment by the National Science and Technology Council (NSTC) found a "lack of coordination, collaboration, and integration of fire science and technology, both among the various producers and between the producers and the community of users."¹⁵ We find that this is still the case, but the root of the problem runs deeper. Despite a proliferation of coordinating bodies, no single entity has successfully marshaled the diverse expertise needed across multiple agencies to address this extremely complex challenge with focus and persistence. Meanwhile, the social and economic impacts of wildfires in some parts of the United States have increased dramatically since that report. In California, for example, the eighth largest fires recorded since reliable record-keeping began in 1932 all occurred in just the last six years.¹⁶ Hence, we recommend designating a single office with a senior leader responsible for a unified course of action to identify, develop, and deploy wildland firefighting technologies across participating federal agencies.

Closing Persistent Technology Gaps for our Wildland Firefighters

*"Our biggest hurdle with all these different technologies is what we call our 'last mile connection.' How do we get this data to boots on the ground?...The communication infrastructure is just not there."*¹⁷

*"In many places we're using radio systems that have been around for 50 years. There's simple push-to-talk devices, but they're not able to handle the large amounts of bandwidth that's required in sharing this type of information."*¹⁷

"We're using a resource ordering and tracking system that was developed in the 1940s and it was developed primarily to move military equipment for World War II...Every one of your cellphones sitting on your desk in front of you can

¹⁴ Porter, T. (March 20, 2019). [Breakout Session] Wildfire Technology Innovation Summit, Sacramento, CA. <https://www.youtube.com/watch?v=0A5h9Kx-3RE>

¹⁵ National Science and Technology Council. (2015). *Wildland Fire Science and Technology Task Force Final Report*, p. 13. <https://www.hsdn.org/?view&did=789991>

¹⁶ California Department of Forestry and Fire Protection. (2022). *Top 20 Largest California Wildfires*. https://www.fire.ca.gov/media/4jandlhh/top20_acres.pdf

¹⁷ Triplett, S. (2022, March 24). [Public Session] PCAST Meeting: Detecting, Tracking, Mitigating, and Preventing Wildfires, Washington D.C. <https://www.youtube.com/watch?v=nNRKDXlkjU>

*order whatever you need and have it delivered to your house tomorrow. I don't understand why as incident commanders, we can order resources and not have them be processed for two days."*¹⁸

*"We could put real-time fire perimeters—and by that I mean one minute from collection to firefighters' mobile phones—in the hands of almost every firefighter in the country right now if we pointed and wrote a few checks."*¹⁹

Recommendation 1:

Given the vulnerabilities and shortfalls in wildland firefighter communications, connectivity, and technology interoperability, immediately assess, adapt, and field currently available technologies²⁰.

The most pressing technological need for wildland firefighting is improved situational awareness on the scene of an active fire. Firefighters rely on a variety of technologies—including aircraft and satellites for real-time operations support, ground-based sensors for fire detection and monitoring, GPS and cellphone-based systems for location tracking, and radio systems for on-the-ground communications—to coordinate their response. This array of systems plays a crucial role in providing incident awareness and assessment, helping to guide operations, and ultimately keeping firefighters safe. However, situational awareness in wildland firefighting currently suffers from persistent vulnerabilities as a result of antiquated and failing infrastructure, a lack of integration/interoperability among the agencies, and outdated technologies. We found that concerns related to the lack of situational awareness were a common refrain, as reflected in the quotes above from wildland firefighters. Action to address this concern is urgently needed and is the top priority in this report.

Technologies such as mobile area networks are now commonly used in the commercial and defense sectors, and they can enhance communications in terrain that is especially challenging and dangerous for wildfire response. USDA and DOI should also develop a program to begin training all federal wildland firefighters on the use of the new technologies immediately. Staff within the National Interagency Fire Center (NIFC) could lead these efforts if allocated a significant increase in their personnel and budget capacity to identify improvements in communications concepts, technology, and delivery systems to support wildland firefighter stakeholders. NIFC could lead the effort with support from NASA, NOAA, FCC, and FAA.

Additionally, the Office of Management and Budget (OMB) should include in the President's Budget sufficient additional funding (dedicated to wildland fire response) above current base levels to sustain these lifesaving technological improvements.

¹⁸ Gardner, D. (2022, March 24). [Public Session] PCAST Meeting: Detecting, Tracking, Mitigating, and Preventing Wildfires, Washington D.C. <https://www.youtube.com/watch?v=nNRKDXlkqlU>

¹⁹ Dargan, K. (2019, March 20). [Breakout Session] Wildfire Technology Innovation Summit, Sacramento, CA. <https://www.youtube.com/watch?v=0A5h9Kx-3RE>

²⁰ Such commercially available technologies might include temporary base stations that leverage firefighters' official or personal mobile devices; satellite internet connectivity for messaging and downloading of tactical image and other situational awareness information; and mode-translating relays (e.g., devices that can relay mobile phone signals to aerial assets).

"Technology is evolving faster than we can keep up with it."²¹

"We've got so much in technology that's coming at us, in the fire service we've been slow to react to that...I've never seen the technology like we are seeing now."²²

"Not enough attention is being paid to those who are trying to bring awareness to new, better technology and solutions that could help keep some of these disasters from happening."²³

Wildland firefighters such as those quoted above recognize the value that new technologies could bring for improving the safety and effectiveness of their work. In the aforementioned context of situational awareness, pilot projects funded by the federal government have demonstrated technologies to give wildfire incident commanders constant, real-time, situational awareness of all firefighters on the scene of an active fire.²⁴ But in many cases, the fire services are left to implement this technology translation by themselves on an *ad hoc* basis in the snippets of time not consumed by fighting fires, refurbishing equipment, training, or clearing fuels to reduce fire hazard. Their efforts are further constrained by budget structures, which specify what work they must be doing when using various funding lines, such as fire suppression or hazard reduction. As another fire chief put it:

"There's many chief officers that don't have the time to invest into looking at all the technology and reviewing all the products and learning about data collection...they're looking for someone to come to them and say, 'look this is what's possible, we're going to be able to provide this to you for a reasonable cost, and you can learn to do this in 30 seconds'...I think our major goal needs to be educate the fire service on what technology is available and how we can adopt that technology."²⁵

The strategic framework for science and technology (S&T) that supports America's warfighters could be adapted to protect and empower wildland firefighters. Indeed, the needs of our wildland firefighters overlap substantially with those of America's warfighters. The Department of Defense (DoD) has dedicated research programs and S&T offices whose primary duty is to ensure that our warfighters are not sent into harm's way without the best of American science and technology at their disposal. A similar strategy for technology development and deployment is urgently needed to support our wildland firefighters. In fact, we see considerable possibility for benefit to firefighters from the warfighter investments already made.

²¹ Marshall, B. (2019, March 20). [Breakout Session] Wildfire Technology Innovation Summit, Sacramento, CA. <https://www.youtube.com/watch?v=0A5h9Kx-3RE>

²² Woodbeck, B. (2019, March 20). [Breakout Session] Wildfire Technology Innovation Summit, Sacramento, CA. <https://www.youtube.com/watch?v=0A5h9Kx-3RE>

²³ Ramos, J. A. (2016). *Smokejumper: A Memoir by One of America's Most Select Airborne Firefighters*. Mariner Books. Ch 15.

²⁴ Jontz, S. (2014, June 11). *DARPA Modifies Military Equipment to be Used by Firefighters*. Signal. AFCEA International. <https://www.afcea.org/signal-media/darpa-modifies-military-equipment-be-used-firefighters>

²⁵ Munsey, D. (Host). (2019, Jan 18). Assistant Fire Chief Dan Munsey on the Future of Fire Service Technology (No. 16) [Audio podcast episode]. Public Safety First Podcast. First Responder Network Authority. https://www.youtube.com/watch?v=nwMXBV7_2wQ

Why hasn't this already occurred given the needs expressed by wildland firefighters? We identified several barriers. Wildfire is one of the more intensively interagency environmental hazards facing the federal government. Responsibilities spanning basic research and technology development, land management, fire detection, and emergency response are scattered across roughly a dozen federal departments and agencies, including USDA (and USFS), DOC, DoD, DOE (and the National Laboratories), DOI, HHS, DHS (and FEMA), EPA, NASA, and NSF (and NCAR and UCAR). The plethora of consensus-driven coordinating bodies²⁶ that have been established over the years to foster coherence of strategy and effort have been unable to deliver the kind of enterprise-level S&T strategy that our firefighters desperately need. Each of these bodies also lacks the institutional mandate, personnel, and budget authority needed to bring new science and technology into wildland firefighting operations in a timely fashion.

NIFC is the one interagency coordinating location focused solely on firefighting operations. It is where the primary federal fire agencies—USFS, DOI and NOAA (for fire weather and environmental intelligence more broadly)—convene with state partners to coordinate firefighting efforts in real-time, something they do exceptionally well. As an entity consisting of firefighters and focused squarely on safe and effective fire operations, NIFC should be the obvious and rightful driver of improved wildland firefighting technologies across the federal firefighting force. It is, however, unable to do this in its present state for three main reasons:

- NIFC is a physical facility, not an executive body, meaning it lacks the authority to direct the actions of any agency.
- It is staffed so thinly that during peak fire season, NIFC requires a surge of temporary, loaned personnel.
- There is no dedicated funding for such activities. The USDA and DOI funds supporting NIFC are designated for either “preparedness” or “suppression.”

Because of these three barriers, NIFC lacks both the authority and the organizational capacity to drive improvements in firefighting technology and cross-agency interoperability (e.g., setting data or equipment standards) that could improve firefighter safety and effectiveness in the field.

Research over several decades^{27,28,29} suggests that investments in technology for early wildfire detection and more effective initial attack could reduce the costs of wildfire suppression—precisely the budget category that is straining forest management resources and preventing the aforementioned technology investments.

Recommendation 2:

Reverse the current trend of rapidly growing wildfire suppression costs by establishing a joint-agency executive office (hereafter Joint Office) that can accelerate enterprise-level

²⁶ These include the National Wildfire Coordinating Group (NWCWG), National Interagency Fire Center (NIFC), Joint Fire Science Program (JFSP), and Wildland Fire Leadership Council (WFLC), among others.

²⁷ Steele, T.W. & Stier, J.C. (1998). An Economic Evaluation of Public and Organized Wildfire Detection in Wisconsin. *International Journal of Wildland Fire*, 8(4), 205-215. <https://doi.org/10.1071/WF9980205>

²⁸ Hirsch, K.G., Podur, J.J., Janser, R.F., McAlpine, R.S. & Martell, D.L. (2004). Productivity of Ontario Initial-Attack Fire Crews: Results of an Expert-Judgement Elicitation Study. *Canadian Journal of Forest Research*, 34(3), 705-715. <https://doi.org/10.1139/X03-237>

²⁹ Arienti, M.C., Cumming, S.G. & Boutin, S. (2006). Empirical Models of Forest Fire Initial Attack Success Probabilities: The Effects of Fuels, Anthropogenic Linear Features, Fire Weather, and Management. *Canadian Journal of Forest Research*, 36(12), 3155-3166. <https://doi.org/10.1139/X06-188>

development and deployment of new technologies that enhance situational awareness and initial attack capabilities.

To drive progress and enable technology adoption across the numerous federal agencies with wildfire equities, we recommend creation of a new Joint Office for wildland firefighting S&T. It is imperative that the Joint Office leader have Cabinet-delegated decision-making authorities as well as the mandate and budget needed to develop and execute a unified technology roadmap. Once operational, the Joint Office could assume responsibility for activities in the remaining recommendations in this report.

We further recommend the Joint Office be housed in NIFC and its senior executive have the mandate and authorities needed to develop and execute an integrated, user-centered, cross-agency roadmap for technology validation, acquisition and deployment. We believe that the end of FY 2024 is realistic target date for creation of the necessary governance structure and budget plan and is in keeping with the need for timely action to support the crucial needs of wildland firefighters. The Office of Management and Budget (OMB) should include in the President's Budget additional funding above current base levels that is sufficient to sustain activities within the Joint Office. We estimate that an annual budget of \$5 million would provide incremental full-time employees sufficient to sustain an impactful level of activity in this office. To put this sum in context, the 2022 appropriation for federal wildland fire suppression activities is \$1.01B.³⁰

Precedent for the recommended joint office structure with Cabinet-delegated, shared authorities exists, such as the joint effort between the Department of Energy and Department of Transportation to build out the nation's electric vehicle infrastructure.³¹

Creating a Comprehensive Wildland Firefighting Technology Roadmap

The technology revolution that has occurred over the last 25 years and benefitted nearly all aspects of American life should be leveraged to help wildland firefighters. There have been sporadic efforts to integrate technology into wildland firefighting to improve effectiveness and reduce risk to firefighters. Operation Firestop, a one-year pilot study in 1954, is an early example credited with adapting World War II and Korean War bombers and helicopters to deliver fire retardants, water hoses, and other equipment in support of wildland firefighting.³² Surprisingly, many of those same technologies are still in use today, despite several generations of improvement to warfighting technology since then.

On the whole, federal agencies that have been tasked with managing wildfires have not had the opportunity to take full advantage of the possibilities that technology can offer to wildland firefighting safety and effectiveness. Staff within NIFC have begun their own assessment of technologies that can modernize wildland firefighting, with a primary focus on information technologies. These include aviation coordination, satellite monitoring, integrated data services, data standards and processing, situational awareness tools, and last mile connectivity (see Figure 1). A

³⁰ 2022 Consolidated Appropriations Act, Public Law 117-103.

<https://www.congress.gov/117/plaws/publ103/PLAW-117-publ103.pdf>, 345.

³¹ Department of Energy. (2021, Dec. 14). *DOE and DOT Launch Joint Effort to Build Out Nationwide Electric Vehicle Charging Network*. <https://www.energy.gov/articles/doe-and-dot-launch-joint-effort-build-out-nationwide-electric-vehicle-charging-network>

³² Richardson, S. D. (1959). Operation Firestop. *Empire Forestry Review*, 38(1 (95)), 26-34. <http://www.jstor.org/stable/42600576>

more comprehensive, user-centered evaluation of this type would provide a strategic vision for development of wildland firefighting technologies within the proposed Joint Office, while also helping to guide the dramatically increasing private sector and philanthropic interest and funding directed toward wildfire S&T.

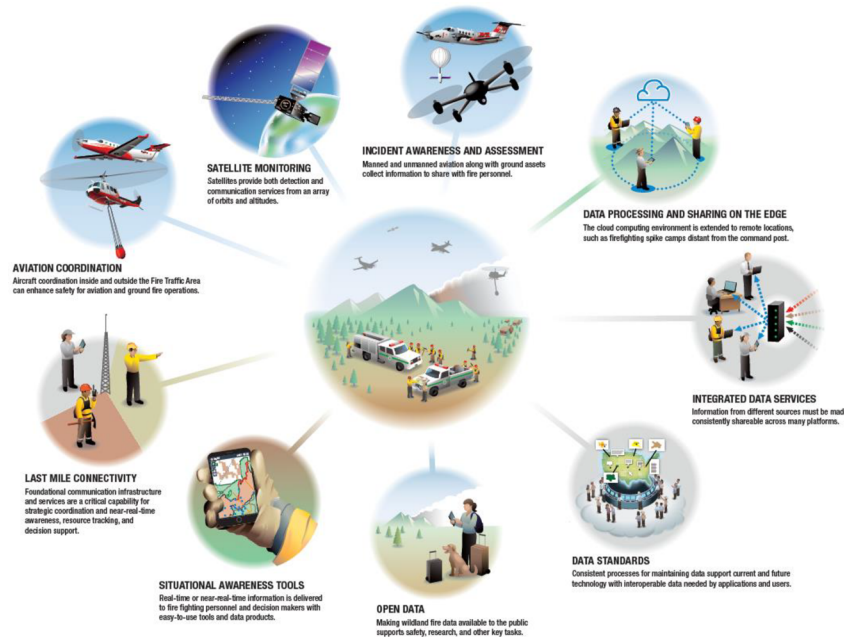


Figure 1. Schematic of key tools and technologies identified in a 2022 assessment by the USFS Wildland Fire Tools and Technology Group. Courtesy of NIFC.

Recommendation 3:

Strengthen the full operational sequence of wildland firefighting—detection, alert, response, and suppression—by assessing existing technologies available within the federal arena, the private sector, and allied nations that could be integrated at each stage.

The assessment should establish clear priorities and develop a roadmap for testing and transition into operations. In addition to the information technologies described above, this broader assessment should identify existing technologies such as uncrewed aerial and ground vehicles, commercial satellite data feeds, and personal protective equipment that can enhance the safety and effectiveness of wildland firefighting. We recommend that the U.S. Fire Administrator lead this effort

until the Joint Office is established. We believe it is feasible to complete the assessment by the end of FY 2024.

Defense Satellite Data for Wildfire Modeling and Prediction

"As a firefighter, understanding what a fire does—and more important, being able to predict what it's going to do—is a matter of life and death."³³

"If we could have that ability to monitor fires, to then forecast their growth, to then lay that on top of a data source we could share with other fire ground commanders, with other emergency responders, with other emergency managers, and most importantly, the public to make them aware there is a fire and aware of the path of that fire—it will help us make smart decisions and it will help us get people out of the way."³⁴

"We really have to use the technology, be it artificial intelligence or machine learning,...and see where these next big large fires are going to occur."³⁵

The ability of incident commanders to track wildfire progression relative to firefighter positions in real time has been described as the "Holy Grail of Firefighter Safety."³⁶ Recent advances in artificial intelligence (AI) make much more accurate prediction of the future course of a wildfire a realistic possibility. These new tools require data from numerous previous fire events in diverse conditions (e.g., topography, vegetation, weather, soil moisture, and other factors) to make accurate forecasts. In the United States alone, there have been more than 1.5 million wildfires since 2000.³⁷ Tens of millions of additional wildfires have occurred outside of our country in that period. Many of these wildfire incidents—occurring in the diversity of conditions required for data-driven modeling—may have been captured incidentally by defense-related space-based assets. These assets offer more consistent coverage and substantially more frequent observations than civilian and commercial systems, resulting in a more detailed picture of a fire's evolution. Archival defense satellite data can potentially provide the much-needed quantity and diversity of wildfire observations necessary to enable breakthroughs in wildfire modeling and prediction.

At this time, however, the data are not available to researchers (with a few exceptions) due to security classification. We can dramatically accelerate progress toward predictive wildfire modeling tools by engaging the broader community of researchers—in national labs, universities, and in the private sector—with expertise in AI, atmospheric science, remote sensing, advanced computational methods, and other disciplines central to our understanding of wildfires. By providing them access

³³ Ramos, J. A. (2016). *Smokejumper: A Memoir by One of America's Most Select Airborne Firefighters*. Mariner Books. Ch 9.

³⁴ Gardner, D. (March 24, 2022). [Public Session] PCAST Meeting: Detecting, Tracking, Mitigating, and Preventing Wildfires, Washington, D.C. <https://www.youtube.com/watch?v=nNRKDXlkqlU>

³⁵ Martin, K. in NatureBridge. (2020, November 20). *Campfire Chat: Fighting Fire with Fire* [Video]. YouTube. <https://www.youtube.com/watch?v=osYKOvroBqM>

³⁶ Gabbert, B. (2014, July 12). *What is the Forest Service Doing About Tracking Firefighters and Fires in Real Time?* Wildfire Today. <https://wildfiretoday.com/2014/07/12/what-is-the-forest-service-doing-about-tracking-firefighters-and-fires-in-real-time/>

³⁷ Hoover, K., & Hanson, L. A. (2022). *Wildfire Statistics*. (CRS Report No. 10244). Congressional Research Service. <https://crsreports.congress.gov/product/pdf/IF/IF10244/65>

to archival space-based detections of wildfires and observations of their spread and by ensuring regular updates from new measurements, the deep and diverse pool of talented researchers across the United States could rapidly advance the state-of-the-art and realize the possibilities afforded by predictive wildfire modeling. This community is poised to use the declassified data immediately, and the federal government has recently made strategic investments in the computational infrastructure required to take full benefit from the new data streams.³⁸ The foresight provided by a reliable, “tried-and-tested” predictive capability can save lives and property by enabling better-informed decisions by incident commanders in response to active fires.

In the absence of this knowledge, firefighters and civilians face much greater risk of catastrophic loss of life and property when confronted with fast-moving wildfires. The Yarnell Hill Fire in 2013 (19 firefighter fatalities,³⁹ \$660M cost⁴⁰) and the Camp Fire in 2018 (85 civilian fatalities, \$16.6B cost⁴¹) are just two of many recent examples.

Recommendation 4:

Accelerate improvement of predictive wildfire modeling tools by expanding research community access to archived satellite data from defense and other government sources.

Effective AI modeling of wildfire spread based on terrain, vegetation cover, soil moisture, wind, and other factors is within our grasp, but only with much broader access to abundant historical data—some of which exists in defense archives but is currently classified. We recommend that DoD, with the support from partners in the intelligence community, NOAA, and NASA, lead a review of the classification level of the archived data.

To accomplish this, DoD, along with its partners in the intelligence community, should complete a review of the classification level of all archived space-based data likely to contain incidental wildfire observations in the defense-related archive of space-based sensors, with the intent of expanding raw data access to the research community where possible. Additionally, DoD should provide an expert technical assessment of the potential value of currently classified wildfire data for predictive modeling, as well as a technical analysis of potential risks to national security created by release of the wildfire data. The previous instances of environmental data declassification noted below lead us to believe this could reasonably be completed by the end of FY 2024.

Similar releases of previously-classified, government satellite data have taken place, from the much-praised Executive Order 12951 (1995) release of CORONA photographic images for environmental studies,⁴² to the release of data from radio-frequency and radiation sensors on Global Positioning

³⁸ See, for instance, WIFIRE. (n.d.). WIFIRE Commons. <https://wifire.ucsd.edu/commons>

³⁹ FEMA. (2023, January 10). *Yarnell, Arizona Wildfire Recovery*. <https://www.fema.gov/case-study/yarnell-arizona-wildfire-recovery>

⁴⁰ Associated Press. (December 31, 2013). Yarnell Hill Fire Damage Claims Total \$662 Million. *Arizona Capitol Times*. <https://azcapitoltimes.com/news/2013/12/31/yarnell-hill-fire-damage-claims-total-662-million>

⁴¹ Maranghides, A., Mell, W., Hawks, S., Wilson, M., Brewer, W., Vihnanek, B., & Walton, W. (2021). *A Case Study of the Camp Fire*. National Institute of Standards and Technology. <https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2135.pdf>

⁴² Earth Resources Observation and Science (EROS) Center. (2018, July 13). *USGS EROS Archive - Declassified Data – Declassified Satellite Imagery-1*. United States Geological Survey. <https://www.usgs.gov/centers/eros/science/usgs-eros-archive-declassified-data-declassified-satellite-imagery-1>

System (GPS) satellites^{43,44} and, most recently, U.S. Space Command's release of a decades-long series of meteor event detections. The Space Command's process for release, which led soon thereafter to breakthroughs in planetary defense science⁴⁵, could be emulated for wildfire data dissemination.

Models developed with the recommended new data streams could inform wildfire prediction and wildfire resilience work underway in several federal departments and agencies (e.g., DOI, USDA/USFS, DOE, NOAA, NASA, NIST, NSF) by identifying terrain and land cover characteristics that promote or retard wildfires. This research can, therefore, further support proactive fuels management practices, such as prescribed burns. The incident of escaped prescribed fires in New Mexico⁴⁶ demonstrates the importance of leveraging the best tools science can offer to properly plan and execute these interventions. Modeling of wildfire emissions, which can also be validated by archival satellite data, can be used to assess the impact of wildfire smoke—from both unplanned fire incidents and from prescribed burns—on the immediate and long-term health of the firefighting force and downwind communities. In addition, better modeling of wildfires near the built environment can inform advance planning for evacuations, particularly of vulnerable populations within such communities. The NOAA National Centers for Environmental Information (NCEI) could be a useful platform for the sharing of data with the research community in national labs, academia, and the private sector.

In cases where the classification review determines that release of the archived raw data would represent an unacceptable risk to national security, we recommend that DoD should establish a mechanism to release technically obfuscated data in a timely fashion to the research community by the end of FY 2025.

Mechanisms of technical obfuscation of the raw data—for example, release of derived fire perimeter polygon data—have already been established to enable access by the research community as Controlled Unclassified Information (CUI). DoD should explore additional means to release archival wildfire data in formats that maximally preserve the scientific value. For example, numerous tools now exist for AI training that facilitate the use of sensitive data without compromising the original sources. Successful examples exist, e.g., in healthcare⁴⁷ and finance, that we believe demonstrate the plausibility for DOD to engage domain experts to establish this alternative data pipeline to the wider research community by the end of FY 2025.

As President Biden told a group of wildland firefighters during his visit to the National Interagency Fire Center in 2021:

⁴³ Los Alamos National Laboratory. (2021, Oct. 6). *Newly Available GPS Data Helps Scientists Better Understand Ionosphere*. <https://discover.lanl.gov/news/1006-gps-ionosphere-data/>

⁴⁴ Voosen, P. (2017, Jan. 30). Los Alamos Releases 16 Years of GPS Solar Weather Data. *Science*.

<https://www.science.org/content/article/los-alamos-releases-16-years-gps-solar-weather-data>

⁴⁵ NASA. (2022, April 7). *US Space Force Releases Decades of Bolide Data to NASA for Planetary Defense Studies*. Asteroids and Comets. <https://www.jpl.nasa.gov/news/us-space-force-releases-decades-of-bolide-data-to-nasa-for-planetary-defense-studies>

⁴⁶ United States Forest Service. (2022). *Gallinas-Las Dispensas Prescribed Fire Declared Wildfire Review*.

<https://sourcennm.com/wp-content/uploads/2022/06/Las-Dispensas-Review-Final-6-19-22-508.pdf>

⁴⁷ Kaissis, G.A., Makowski, M.R., Rückert, D., Braren, R. F. (2020). Secure, Privacy-Preserving and Federated Machine Learning in Medical Imaging. *Nature Machine Intelligence*, 2, 305–311.

<https://doi.org/10.1038/s42256-020-0186-1>

"We have a commitment at the Department of Defense to defend home, as well as abroad, and that includes the fire service."⁴⁸

The Biden-Harris Administration has already acted on this commitment by providing DoD aircraft and personnel to support wildfire detection and monitoring, as well as firefighting operations. The present recommendation of wider satellite data access represents a potentially transformative opportunity to use archival defense-related wildfire observations to do even more to keep firefighters safe on the front lines.

Enabling Technologies for Next-Generation Wildland Firefighting

"The technology is there. The challenge is educating fire staff and the powers-that-be that UAVs [uncrewed aerial vehicles] are a tool that will increase safety and save money."⁴⁹

"In the fire service, we've been waiting for this [UAV] application for quite a while. Frankly, this is a very safe and effective means of being able to do that transmission of the gear, the water that firefighters need."⁵⁰

"There's going to be a lot more use of drones in the future for the fire service, and that's driven by efficiency...Being able to deploy drones on dispatch to get out and give us situational awareness to be able to modify alarms are things that we're gonna see in the future."⁵¹

Technological advances in uncrewed aerial vehicles and other autonomous systems can increase protections for wildland firefighters and expand our nation's wildfire response capacity. The threat posed by the current trend toward larger and more severe wildfires⁵² is exacerbated by firefighter staffing shortages at state and federal levels. Already in 2021, large proportions of requests for wildland firefighting resources went unfilled, including 40% of requests for hand crews, 29% of requests for fire engines, 30% of requests for tactical water tenders⁵³, and 35% of the nearly 40,000 requests for auxiliary support personnel.⁵⁴ While 2021 was an historically active fire season, it is essential that we prepare for the potential that future fire seasons could be even more challenging.

⁴⁸ The White House. (2021, Sept. 13.). *Remarks by President Biden in Briefing with Federal and State Fire Agency Officials*. <https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/09/13/remarks-by-president-biden-in-briefing-with-federal-and-state-fire-agency-officials/>

⁴⁹ Ramos, J. A. (2016) *Smokeyjumper: A Memoir by One of America's Most Select Airborne Firefighters*. Mariner Books.

⁵⁰ Munsey, D. (2022, May 4). [Public comments]. Unpiloted Aerial Vehicle Demonstration. San Bernardino, CA.

⁵¹ Munsey, D. (Host). (2019, Jan 18). Assistant Fire Chief Dan Munsey on the Future of Fire Service Technology (No. 16) [Audio podcast episode]. Public Safety First Podcast. First Responder Network Authority. https://www.youtube.com/watch?v=nwMXBV7_2wQ

⁵² Iglesias, V., Balch, J.K., & Travis, W.R. (2022) U.S. Fires Became Larger, More Frequent, and More Widespread in the 2000s. *Science Advances*, 8(11), eabc0020. <https://doi.org/10.1126/sciadv.abc0020>

⁵³ Vehicles that are specifically designed for bringing suppressants to fire engines in the field

⁵⁴ National Interagency Coordination Center. (2021). *Resource Activity Charts and Tables*. https://www.predictiveservices.nifc.gov/intelligence/2021_statsumm/resource_charts_tables21.pdf

Recent actions by the Biden-Harris Administration have increased federal firefighter pay,⁵⁵ and FY 2023 appropriation legislation⁵⁶ could help attract and retain firefighters; however, the demand for firefighting resources may continue to outstrip the supply. To adequately prepare for long-term workforce needs, the federal government should develop new technologies for enhancing the reach and capacity of our wildland firefighting forces. Recent advances in autonomous drones and robotics can be leveraged to decrease the physical burdens of wildland firefighting, increase situational awareness, and perhaps even reduce the need for human firefighters to be present on the front lines of active wildfires.^{57,58}

These tools can be particularly helpful in addressing major wildfires that can grow rapidly in forested, steep terrain areas, which are challenging to reach in a timely fashion using traditional firefighting equipment.

DoD possesses deep expertise in drones, robotics, and other relevant technologies, but the present application to domestic wildland firefighting calls for leadership from a civilian agency. The Joint Office proposed in this report's second recommendation could steward this type of activity once it is established. Given the urgency of the wildfire threat, an existing agency should be designated interim leader and charged with driving immediate progress.

The question then is which of the many civilian agencies with wildfire equities is best-suited for this interim role. We assess that NASA is uniquely capable of achieving real-world, field demonstrations of new wildland firefighting technologies that combine remote sensing, environmental modeling, and robotics. NASA has a long legacy of working with frontline firefighters to pioneer and deploy new tools that improve the safety of firefighting, beginning more than 50 years ago in a collaboration with the International Association of Fire Fighters (IAFF) aimed at developing more effective fire protection suits.⁵⁹ Today, the Aeronautics Research Mission Directorate in NASA is actively developing tools needed to support the use of uncrewed aerial systems (UAS) for wildfire response.⁶⁰

Recommendation 5:

Expand our nation's wildfire response capacity by encouraging development and field demonstration of prototype autonomous detection, assessment, and containment systems for wildland fire.

⁵⁵ The White House. (2022, June 21). *The Biden-Harris Administration Announces New Pay Raises & Supports for Wildland Firefighter Workforce from Bipartisan Infrastructure Law* [Fact sheet]. <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/21/fact-sheet-biden-harris-administration-announces-new-pay-raises-supports-for-wildland-firefighter-workforce-from-bipartisan-infrastructure-law/>

⁵⁶ 2023 Consolidated Appropriations Act, Public Law 117-328. H.R. 5631 - 117th Congress (2021-2022): Tim Hart Wildland Firefighter Classification and Pay Parity Act.

⁵⁷ DARPA News. (2022, Feb. 8). *ALIAS Equipped Black Hawk Helicopter Completes First Uninhabited Flight*. <https://www.darpa.mil/news-events/2022-02-08>

⁵⁸ Zhou, X., Wen, X., Wang, Z., Gao, Y., Li, H., Wang, Q., Yang, T., Lu, H., Cao, Y., Xu, C., & Gao, F. (2022). Swarm of Micro Flying Robots in the Wild. *Science Robotics*, 7(66), eabm5954. <https://doi.org/10.1126/scirobotics.abm5954>

⁵⁹ International Association of Fire Fighters. (2003, Oct. 13). *Project Heroes: Homeland Emergency Response Operational and Equipment Systems*. <https://www.cdc.gov/niosh/npptl/pdfs/ProjectHEROES-508.pdf>

⁶⁰ Kopardekar, P., & Grindle, L. (2021). *NASA ARMD Wildfire Management Workshop*. NASA. https://www.nasa.gov/sites/default/files/atoms/files/nasa_armd_wildfire_management_workshop_6.1.2021_v13.pdf

Uncrewed aerial vehicles and other autonomous systems are poised to be able to dramatically increase our nation's wildfire response capacity, especially at a fire's incipient stages, while also providing new means to protect firefighters on the scene of active wildfires. Emerging private sector efforts can be dramatically accelerated in partnership with federal agencies. One key facet of this task will be to develop a cross-jurisdictional regulatory and operations framework and concept of operations governing land access, aircraft and airspace operations, and other operational factors. We recommend that the Aeronautics Research Mission Directorate within NASA lead this effort until the Joint Office is established, in close coordination with the DOI, the USFS, and the FAA. NASA could also help to develop and assess technology prototypes for eventual transition to respective organizations and industry.

We believe that the enabling technology and cross-jurisdictional regulatory frameworks for these field demonstrations can be realized by the end of FY 2027. The Director of OMB should identify additional funding required to implement this approach, including additional personnel and training resources.

This federal effort toward autonomous wildland firefighting can also leverage emerging private sector initiatives toward the same goal. For example, the XPRIZE Foundation is a non-profit organization that has previously sponsored prizes to spur progress on significant societal challenges such as human spaceflight and carbon removal. The \$10 million XPRIZE for private spaceflight, launched in 1996, is credited with helping to create⁶¹ the multi-billion-dollar industry that is now led by U.S.-based companies such as Blue Origin, SpaceX, and Virgin Galactic. Planning is underway for a \$15 million prize that will source teams to develop integrated systems that can autonomously detect, assess, and suppress potentially catastrophic wildfires quickly.⁶² An ongoing collaboration with the State of California aims to ensure that these new technologies can protect vulnerable communities and infrastructure throughout the state.⁶³ Coordination between the lead federal agencies and private sector efforts to spur technology innovation, such as the XPRIZE, can ensure that private sector efforts are effectively aimed toward known vulnerabilities in wildfire response and can facilitate effective dissemination of new technologies to wildland firefighters throughout the country, e.g., via NIFC. These tools can support our nation's firefighters both in suppressing unplanned fires and controlling the prescribed burns they conduct to reduce fuels and foster greater wildfire resilience.

⁶¹ NASA. (2010) *Ansari X-Prize: A Brief History and Background*. <https://history.nasa.gov/x-prize.htm>

⁶² XPRIZE Foundation. (n.d.). *XPRIZE Wildfire: Executive summary*. https://assets-us-01.kc-usercontent.com/5cb25086-82d2-4c89-94f0-8450813a0fd3/066a7a7b-5e5b-4e8b-9660-ceaf7168a7b1/XPWILDFIRE_ExecSumm.pdf

⁶³ Office of the Governor. (2019, October 26). *Governor Newsom Announces New Partnerships and Tools to Help California's Most Vulnerable Residents During Power Shutoffs*. <https://www.gov.ca.gov/2019/10/26/governor-newsom-announces-new-partnerships-and-tools-to-help-californias-most-vulnerable-residents-during-power-shutoffs>

Conclusion

"We have fewer available humans to fight fire effectively than we have in the past, and we get stretched. How do we extend a human's efficacy?"⁶⁴

"Our resources are becoming tired, they're getting overworked, and it's a very extensive physical toll on our firefighters, our population."⁶⁵

"[W]e have a problem in the West and we need help. Tracking resources, monitoring fires, predicting spread, and notifying people. It'll help us stay safer. It'll help us keep our responders safer and it'll help us keep our public safer."⁶⁶

Implementing the recommendations in this report will leverage our nation's leading science and technology to better protect wildland firefighters and to modernize our wildfire response enterprise, including the tools used to combat fires and the organizations that develop and deploy those tools. We fully recognize the importance of forest management and similar long-term investments in wildfire prevention, but observe that those activities have received greater attention and investment than new technology development for wildfire response. For example, the recently-passed Inflation Reduction Act provides more than \$2 billion in funding for forest management and wildfire fuels reduction, but no funding for improving wildland firefighting tools and technologies.⁶⁷ A similar differential exists between funds for wildfire prevention and wildfire response technologies in FY 2022 and FY 2023 appropriations.^{68,69}

Hence, in this report we have intentionally trained our focus on critical aspects of wildfire response that are stuck—technologically and organizationally—in the last century. The actions recommended in this report include measures that can be taken immediately to support the technology needs of today's wildland firefighters. These recommendations also propose efforts for establishing the infrastructure needed to ensure wildland firefighting continues to benefit from advances in science and technology for decades to come. The technological advances spurred by Presidential action on these recommendations can make wildland firefighting safer and more effective, while also addressing growing shortages of firefighting resources. Finally, though these recommendations focus on wildfires, they may also serve as a blueprint to similarly leverage current and future S&T for the broader range of climate resilience challenges that our country faces, such as drought, flooding, heat waves, and severe storms.

⁶⁴ Porter, T. (2019, March 20). [Breakout Session] Wildfire Technology Innovation Summit, Sacramento, CA. <https://www.youtube.com/watch?v=OA5h9Kx-3RE>

⁶⁵ Triplett, S. (2022, March 24). [Public Session] PCAST Meeting: Detecting, Tracking, Mitigating, and Preventing Wildfires, Washington D.C. <https://www.youtube.com/watch?v=nNRKDxIkIqU>

⁶⁶ Gardner, D. (2022, March 24). [Public Session] PCAST Meeting: Detecting, Tracking, Mitigating, and Preventing Wildfires, Washington D.C. <https://www.youtube.com/watch?v=nNRKDxIkIqU>

⁶⁷ Public Law 117-169, <https://www.congress.gov/bills/117/congress/house-bill/5376>

⁶⁸ Public Law 117-103, <https://www.congress.gov/117/plaws/publ103/PLAW-117publ103.pdf>

⁶⁹ 2023 Consolidated Appropriations Act, Public Law 117-328.

<https://www.congress.gov/117/bills/hr2617/BILLS-117hr2617enr.pdf>

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Appendix A. External Experts Consulted

PCAST sought input from a diverse group of additional experts and stakeholders. PCAST expresses its gratitude to those listed here who shared their expertise. They did not review drafts of the report, and their willingness to engage with PCAST on specific points does not imply endorsement of the views expressed herein. Responsibility for the opinions, findings, and recommendations in this report and for any errors of fact or interpretation rests solely with PCAST.

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NIFC Radio Shop
NIFC Warehouse
Boise Smokejumpers

Senator CANTWELL. We passed the Dingell Act several years ago. So when are we going to have these new tools for firefighters this year on technology, on mapping, on communication?

Mr. MOORE. So Chairwoman Cantwell, we have deployed trackers in certain areas and we are working through the interoperability in other areas. We are also issuing and developing standards for their use. We will be deploying resource trackers on our fire and our fleet vehicles this year, this fiscal year, and we plan to operationalize the wildland Fire Factor trackers in 2024. We are also working with the Colorado Center of Excellence to develop team awareness kits that really provide a common operating picture for the crews as they work on these incidents.

Senator CANTWELL. Well, I can't emphasize enough how important this technology and information is. You may know we were very involved, particularly when it came to weather forecasting, because we, again—what turned into a deadly fire in the central part of the state, and a forecaster basically said, yes, go deploy people. The people in Seattle were definitely saying no, you should not have deployed people. The winds were that high. So we have to get the right information in the hands of people who are on the ground taking the risk. And so we will follow up with you and get even more specificity on what the resources may be that we need to make sure this is implemented.

Senator BARRASSO.

Senator BARRASSO. Thanks so much, Madam Chairman.

Chief Moore, last month, I sent a letter to you along with Senator Lummis from Wyoming and Representative Hageman. We sent the letter to you as well as Secretary Vilsack. The letter details our concern over our home State of Wyoming's exclusion from the ten-year strategy to address the wildfire crisis. We have a map here. You see in bright red, those are the areas that are designated. We saw your map, Madam Chairman. These are the areas that have been designated for wildfire mitigation under the strategy that you have outlined.

[The letter and map referred to follow:]

Congress of the United States

Washington, DC 20515

March 15, 2023

The Honorable Tom Vilsack
Secretary
United States Department of Agriculture
1400 Independence Ave. SW
Washington, DC 20250

The Honorable Randy Moore
Chief
United States Forest Service
201 14th St. SW
Washington, DC 20227

Dear Secretary Vilsack and Chief Moore,

We write regarding the U.S. Department of Agriculture (USDA) and the U.S. Forest Service's ongoing implementation of its 10-year strategy to combat wildfires across the American West. While we strongly and unequivocally support efforts to increase the proactive management of National Forests, we are deeply concerned with the continued exclusion of our great state of Wyoming from this strategy. We therefore urge USDA and the Forest Service to better defend Wyoming's forests and rangelands by including them in the 10-year strategy, as well as broader agency efforts to combat wildfires.

As you know, America's western forests are in the midst of a crisis. Each year millions of federal, state, and private acres are devoured by wildfires that are intensified by drought and unhealthy forest conditions, annihilating forested ecosystems, destroying homes and livelihoods, and tragically ending human lives. Forest Service data suggests that one-third of all National Forest System lands are at severe risk to such devastating, landscape-altering wildfires. These 63 million at-risk acres—roughly equivalent to the size of Wyoming—must be actively managed in order to avert future catastrophes and return our National Forests to a healthy state.

In recent years, Congress has provided agencies with increased funding and streamlining tools to dramatically increase the pace and scale of wildfire risk reduction projects. In response, on January 18, 2022, the USDA and Forest Service announced a renewed 10-year strategy to help address the western wildfire crisis.¹ Under this strategy, the Forest Service committed to directing its increased resources to reducing wildfire risks within areas it deems as 'firesheds'—large forested landscapes with a high likelihood that ignition will expose homes, communities, wildlife habitat, watersheds, *etc.* to a severe and uncontrollable wildfire.

¹ <https://www.usda.gov/media/press-releases/2022/01/18/secretary-vilsack-announces-new-10-year-strategy-confront-wildfire>

Unfortunately, of all western states located on or west of the Rocky Mountains, Wyoming was the only state without a designated fireshed. Since then, USDA and the Forest Service have announced significant investments across 21 separate landscapes that largely mirror or overlap designated firesheds.² As such, Wyoming is the only western state to date that has not received a landscape investment.

We are further troubled by Wyoming's exclusion from the Wildland Fire Mitigation and Management Commission. This Congressionally-mandated commission is tasked with forming federal policy recommendations and strategies to improve wildfire prevention, management, and suppression. Recognizing the influence this commission would likely have on America's wildfire strategy, our Congressional delegation joined a March 24, 2022 letter to USDA, the Department of the Interior, and the Federal Emergency Management Agency (FEMA) specifically requesting that Wyoming be represented on the commission. Once again, however, Wyoming was the lone western state to be excluded.

Like the rest of the West, Wyoming is incredibly vulnerable to catastrophic wildfire. Over the past five years we have experienced numerous destructive burns, including four wildfires severe enough to warrant emergency assistance from FEMA's Fire Management Assistance Grant program. In 2018, tens of thousands of acres on the Bridger-Teton and Medicine Bow National Forests burned in the Roosevelt and Badger Creek fires. In 2020,³ the Mullen megafire devastated over 175,000 acres on the Medicine Bow-Routt National Forests, while the RR316 blaze scorched thousands of our rangeland acres in Carbon County. These fires wreaked havoc on our forests and our communities. Lives and livelihoods were upended; precious natural resources and critical infrastructure went up in smoke.

According to recent Forest Service estimates, more than four million acres in Wyoming are at either 'high' or 'very high' risk to catastrophic wildfire.⁴ These acres harbor and neighbor wonderful communities, pristine national treasures like Yellowstone and Grand Teton National Parks, majestic wildlife, and crucial infrastructure and energy resources. They also contain important watersheds that are part of the headwaters of the Colorado River. These headwaters are critical for western states that rely on the Colorado River Basin's vital water resources. The longer the Forest Service and USDA delays the urgent work needed to restore high-risk acres to good health, the longer our people and resources remain dangerously susceptible to catastrophic fire.


² <https://www.usda.gov/media/press-releases/2023/01/19/biden-harris-administration-launches-new-efforts-address-wildfire>

³ In 2020 alone, Wyoming experienced nearly 340,000 burned acres, a land area larger than Grand Teton National Park.

⁴ Over half of such acres (2.4 million) are located on Wyoming's National Forests.

Again, we strongly urge USDA and the Forest Service to include Wyoming within its 10-year wildfire strategy, and in any other applicable agency efforts to combat western wildfires. We look forward to your engagement with us on this extremely important issue.

Sincerely,


John Barrasso, M.D.
United States Senator


Cynthia Lummis
United States Senator


Harriet Hageman
Member of Congress

CC:
The Honorable Deb Haaland
Secretary
United States Department of the Interior
1849 C Street NW
Washington, D.C. 20240

USFS 10-year Strategy: Areas for Wildfire Mitigation



Senator BARRASSO. Every state west of the Rocky Mountains has designated areas except the State of Wyoming. What is the rationale, when I have already outlined earlier how many acres have burned and the threats that we have in Wyoming and the places even on your own website where there are threats for Wyoming? Why in the world would Wyoming be excluded from these designations?

Mr. MOORE. So let me say up front, Senator, there is no reason I could give you that you would accept simply because Wyoming appears to be missing. I will say that we have other ways of working in Wyoming, and we are working in Wyoming in other ways through the collaboratives. You are getting quite a bit of funding there. We are also looking at wildland urban interface areas where we have had members from the different states and tribes evaluating the proposals. We had 100 proposals for this work. And so, you know, this is the first round. We awarded a little over \$200 million, but we have up to a billion dollars to award. So the fact that you don't have anything currently does not mean that you will not be getting anything in the future.

But I will say too, though, that you are pointing out the need for us to continue in this effort that we are doing. And as much money as we are receiving, and we are very thankful to Congress for that, it is not enough to take care of the problems to the degree that we see them taking place, particularly across the West. So this down payment that we have through the bill's funding and the IRA funding is a good down payment and it is very much appreciated, but it is not enough to hit all of the areas out West. Our intent is to make sure that we don't leave Wyoming out in this picture that we are trying to create in terms of how we are responding to wildfires. And so, Senator, I would just say that, for right now, you did not get one of the 21 landscapes, but please understand that there is so much other work going on outside of the 21 landscapes where Wyoming is benefiting.

Senator BARRASSO. So is the Forest Service planning to designate areas in Wyoming in the future?

Mr. MOORE. I don't know, but we would certainly be happy to work with you as we take a look at what the possibilities are. And I can say with certainty that if there is another round of funding, that Wyoming would certainly be one of the landscapes that we would focus on.

Senator BARRASSO. You know, the first time we met it was to discuss the situation of the Black Hills National Forest. At the time, our local sawmills were teetering on the brink of collapse. Some actually ended up closing down or reducing their hours. This was due in large part to the Forest Service actions that dramatically lowered the timber harvest levels. Since our meeting, I have been encouraged by many of your actions to help address the dire situation, but still, there is a long way to go in order to ensure the long-term viability of the remaining sawmills. Your state partners in Wyoming and South Dakota really stand ready to help. How might your agency find ways to further leverage the good efforts the people of Wyoming and South Dakota are engaged in right now?

Mr. MOORE. So Senator, you know, we have been working really hard with the state agencies, as well as other partners, to really

look at just the viability of the industry going forward. And while we are focusing on innovations moving into the future, we also have to look at retaining existing infrastructure. And so, we have a pilot project that the Black Hills is tied into where we are moving timber from one part of the country to other parts of the country to maintain its viability. And so, we will continue to do that. I am really pleased with the success and the progress that we have had to date on that project. And I would really like to encourage other parts of the country to look at this pilot program that we are working on between South Dakota, Wyoming, and California.

Senator BARRASSO. We are hoping that the agency could use its Good Neighbor Authority to allow states to help complete needed permitting reviews themselves, do it themselves without having to go further.

Mr. MOORE. We are certainly working toward that. In fact, we have 37 states where we have Good Neighbor Authority agreements in place.

Senator BARRASSO. Thanks, Madam Chairman.

I have some questions for a second round.

Senator CANTWELL. Thank you, Senator Barrasso.

Senator Heinrich.

Senator HEINRICH. Thank you, Madam Chairman.

And let me just start by saying this hearing is about the Forest Service's budget, and any budget is reflective of our values and our priorities. And if we believe that fuel treatments are critical, then we need to fund those projects. And I believe it is clear that not adequately funding this agency's budget will clearly result in more catastrophic wildfires. We can't have it both ways. Congress needs to step up and help you have the resources to address these issues.

Now, Chief, as you know, northern New Mexico experienced the Hermit's Peak/Calf Canyon fire last spring. That was a prescribed fire run amok. It was the most devastating and largest fire in our state's history. We just passed the one-year anniversary of that fire, and the communities in this area are still, in my opinion, in the very early stages of recovery. And that recovery is critical to rebuilding trust with the Service. One of the concerns that I am hearing about is whether last year's flood mitigation efforts on Forest Service land will be sufficient to keep downstream communities from flooding. So I want to ask you, one, are you confident that the work over the summer and the fall will be sufficient, and secondly, will the Forest Service continue mulching and seeding treatments this spring?

Mr. MOORE. Yes, Senator, let me first acknowledge the extraordinary impacts that these events have had on the people and the communities in New Mexico. I have personally gone out to tour the area, and the impacts have been really devastating in many of the communities that you serve, and that we serve, in general. The Forest Service and USDA, in general, is actively working with the state and FEMA to monitor the results of our treatments that we put in place last year and also to look at what the potential risks are for flooding and how the work that we have done last year might be affected. So we are working on a joint project—joint mitigation response—and we have a team that is in place to monitor

the impacts that this spring's runoff would have on that work that was done.

Senator HEINRICH. Are you planning on additional mulching and seeding treatments this spring?

Mr. MOORE. Yes, let me say also that the work that we did last year and the funding that we received to do that work last year, we did complete that work. And so, as I said, now what we need to do is monitor the effectiveness of the work that we did. Going forward, particularly looking at the supplemental funding, that will allow us to fund more work in the coming years, depending on how—

Senator HEINRICH. So for places where it is found not to be effective, you will go in and do more?

Mr. MOORE. Well, what it does is, it gives us a long-term option to repair the damage from the fires. The supplemental dollars are really useful, but they are not necessarily timely, and that is the issue—we are trying to get the emergency disaster work done in a timely manner before the spring storms hit so that we can hold this in place, but we are pretty optimistic so far on the work. The communities have really just gone above and beyond working with us and FDA in general—

Senator HEINRICH. No question.

Mr. MOORE [continuing]. In terms of the state setting aside funding to supplement what the feds are doing. The communities are coming out, developing community groups to work with us and to help point us in the right direction. And one of the impacts that we have seen, and I may get the pronunciation wrong being from the south, but the acequias—

Senator HEINRICH. Pretty close.

Mr. MOORE [continuing]. That have been damaged significantly.

Senator HEINRICH. Yes.

Mr. MOORE. Through a lot of fire.

Senator HEINRICH. Sedimentation.

Mr. MOORE. That was in the uplands.

Senator HEINRICH. Yes.

Mr. MOORE. So we toured those areas and we do think it is a tragic situation and we are committed, Senator, to trying to replace the resources damaged through that fire.

Senator HEINRICH. If resources are an issue, I want to hear from you, Chief, because the only way we are going to rebuild trust is to make sure that we see this through for the long term.

It has been almost three years ago now that Congress passed the Great American Outdoors Act, and that made the Land and Water Conservation Fund funding permanent. Now that funding through LWCF is guaranteed and is predictable, how quickly is the Forest Service able to move to closing on projects, and in particular, for 2021 and 2022, how much of the Forest Service's land acquisition budget from LWCF has actually gone out the door versus projects that are still in the closing process?

Mr. MOORE. So let me say going into this though that, you know, our processes served us well in the past, and what I am finding more often than not, is that the processes that we are using need to be streamlined. And you take the situation that you just mentioned—right now it is taking about three years. The process is

complicated, so that's no mistake about that, but we are looking at our policies to streamlining approaches to really work to streamline that because we are seeing where other entities can get this done in a much quicker fashion. And so, the logical question is, then, why can't we?

And so we are interested in working with you to see if we can't work quicker on these areas. But Senator, we are committed to streamlining as much as we possibly can, like we have done in other areas so far because we do want to meet Congress's intent when they allocate monies to us. And we do want to show that we are a good place to make an investment.

Senator CANTWELL. Thank you.

Senator DAINES.

Senator DAINES. Senator Cantwell, thank you.

Wildfires are already burning. They are currently burning in the southern and southwest areas of the country. I think over 300,000 acres have already burned. And while this is occurring, needed forest management work that will decrease the risk of catastrophic wildfires is delayed across the West by litigation. In fact, in Montana alone, there are over 300 million board-feet tied up by litigation. If we are serious about maintaining healthy forests and ending the cycle of these catastrophic wildfires that we see every summer, we must, number one—cut red tape to speed up the NEPA process. You talked about the process and how long it takes just now, Chief. Two—empower states, empower counties, and empower our tribes to better manage our national forests through partnerships like the Good Neighbor Authority. And three—continue to hold the Forest Service accountable for commitments they make. So Chief Moore, thanks for being here today to discuss the Forest Service budget request.

Back in 2018, Congress did pass a partial fix to the Ninth Circuit's Cottonwood decision, but this fix expired in March. In fact, it was exactly March 23, 2023. The Forest Service has testified that 87 forest plans—87—will have to immediately reinstate consultation with the U.S. Fish and Wildlife Service. And this consultation will take between five and ten years to finish, and it is going to cost tens of millions of dollars. How does the re-consultation requirement on these 87 forest plans, Chief Moore, impact the Forest Service's ability to complete work on your ten-year wildfire strategy?

Mr. MOORE. Well, Senator, first, thank you for your help and support on this issue. I think it almost goes without saying that if we have to divert a lot of our resources and attention to reconsulting at the plan level with, you know, Fish and Wildlife and others, that it is going to have an impact on what we are planning to do throughout this year. And the wildfire crisis strategy is our priority. Getting resources in for our firefighters, you know, you are looking at mental health. I mentioned earlier, all those things that we are trying to do as well as hiring and retaining a lot of our firefighters, but also our workforce in general. That would be taking away from our ability to implement a lot of the things that we have planned for this year. So it would be a huge impact.

Senator DAINES. We were warning the folks up here on the Hill about the expiration. That is why we needed to get that Ninth Cir-

cuit Cottonwood fix passed because of this looming deadline that now expired last month. And now that it has expired, would you agree that a full and permanent Cottonwood solution should be a high priority and a bipartisan priority for this Congress?

Mr. MOORE. Yes, sir, I do.

Senator DAINES. Thanks. And I look forward to working with my colleagues and continuing to work with you to get this legislation across the finish line.

In 2021, Congress provided the Forest Service with a new categorical exclusion for linear fuel breaks and a new emergency authority to expedite projects to avert or respond to catastrophic wildfires. The Forest Service reported using the linear fuel break authority, but only this year did Secretary Vilsack invoke the other new emergency authority across 250 high-risk fire sheds that the Forest Service has now identified. Twenty-three of these high-risk fire sheds are in Montana and we split a 24th with Idaho. So it is important that this emergency authority be used to get management work done on the ground. My question, Chief Moore, is how many requests have you received from regions to use this new emergency authority, and how many of these have you approved, or what do you anticipate the timeline might be?

Mr. MOORE. So Senator, so far, we have had eight requests to come in. We have approved six of those.

Senator DAINES. And how many of these linear fuel breaks categorical exclusions have they actually used and in which regions?

Mr. MOORE. Well, so, for context, let me say in general, you know, right now about 85 percent of our projects use categorical exclusion. And if you want to know in terms of a number, that is about 4,000 CEs per year that we are using, on average, and that is a pretty significant increase from a few years ago. So we are looking at streamlining. We are looking at using the appropriate tool depending on the situation out on that landscape. We are looking to continue trying to streamline our processes. I mentioned that earlier. That is one of my priorities, is to look at where we can streamline our processes to really get the work done at that ground level rather than spending so much time planning.

Senator DAINES. Yes.

Mr. MOORE. I think we have a pretty good bead on planning. We see where we have some opportunities to decrease the amount of time that we are spending on that and we are also seeing productivity increasing out in the field when we are able to do that.

Senator DAINES. Thank you, Chief Moore.

Senator Cantwell, thank you.

I look forward to working with you on that Ninth Circuit Cottonwood fix. Talk about streamlining, it is adding five to ten years, and there is no time right now. But that is a golden opportunity for us to take advantage of right now in this Congress. I hope we can do it and help you on that.

Thank you.

Senator CANTWELL. Thank you.

Senator HIRONO.

Senator HIRONO. Thank you, Madam Chair.

Chief Moore, it is good to see you again. I appreciate your attentiveness to Hawaii and the Pacific region and note that state nat-

ural resource managers back home tell me that they have a good working relationship with the Forest Service. We are always looking for new opportunities to strengthen those relationships, one of which is through potentially establishing a national forest in Hawaii. As the bill requiring the study was signed into law late last year, can you provide an update on where the Forest Service is in conducting the study, and going forward can you provide me with quarterly updates on the study?

Mr. MOORE. Sure. So we expect a contract out and completion of the study within the next 90 days. And I do think quarterly updates would be logical and practical, but Senator, also know that any time you would like to have an update, we would be happy to provide you with one.

Senator HIRONO. Thank you very much.

The use of natural infrastructure is becoming an increasingly popular and effective alternative to more traditional gray infrastructure solutions throughout our country. I currently have a bill that directs the Forest Service and U.S. Geological Survey to establish a joint natural infrastructure science program that would work with colleges and universities to supply the necessary research on natural infrastructure solutions. Can you discuss in general the Forest Service's experience with using natural infrastructure and the role you see it playing in future projects?

Mr. MOORE. So this is a critical piece that we should be looking at, and I think there is a critical role for natural infrastructure protecting and sustaining, particularly, source watersheds, as we talk about. The research topics, which our Forest Service scientists and collaborators can primarily address, are those involving wood building materials and the use of wood to enhance other building material.

Senator HIRONO. So would you support the establishment of a joint natural infrastructure science program, because I find that working with universities, or, in fact, even with students in high school and in earlier grades where they are exposed to these kinds of methods, really plays a big part in our contending with the changes that, you know—the need to protect our environment. So would you support such a science program?

Mr. MOORE. Yes, of course I would, Senator.

Senator HIRONO. Okay.

There is also broad interest in establishing a climate hub in Hawaii to promote more localized tools and resources in the Pacific region, and of course, the lessons learned in Hawaii through the creation of such a hub would have applicability to island nations throughout the Pacific because we are contending with the impact of climate change. So additional funding is needed to make such a hub a reality, as identified in the Agricultural Research Service's FY24 budget request, and I am currently working with my colleagues to secure that funding. Can you discuss the role that climate hubs play in helping producers and land managers adapt to climate change, and do you expect stakeholder demand for these hubs to increase in the future?

Mr. MOORE. I do expect for the demand to increase in the future. One of the examples from a USDA Southwest Climate Hub hearing is the Pacific Drought Knowledge Exchange website. This enables

collaborative relationships, you know, among drought stakeholders in Hawaii and the Pacific Island nations. And it also provides clear factual information for educational purposes, staff training, and also community outreach.

Senator HIRONO. So these hubs work to bring, I think, focused attention on that kind of work, and I hope that you will support our efforts to fund such a hub in Hawaii.

Mr. MOORE. Yes.

Senator HIRONO. Thank you.

Senator CANTWELL. Thank you.

Senator Cortez Masto.

Senator CORTEZ MASTO. Thank you, Madam Chair.

Chief Moore, it is good to see you again. Thank you for being here.

Mr. MOORE. It is good to see you.

Senator CORTEZ MASTO. I don't think you had a choice, but thank you.

[Laughter.]

Senator CORTEZ MASTO. Let me start, because you talked a little, and you have been hearing about this. Our fire seasons have become a year-round reality, as you have heard, particularly in the West and in Nevada as well, threatening lives, property, and small businesses. It is critical now more than ever that we provide our firefighters with the support and tools they need to combat these wildfires that are hotter and longer as we see happening. Accordingly, the Forest Service's FY24 budget request notes your agency's intent to build on the Bipartisan Infrastructure Law, which you talked about today, as well as last year's budget request, to enhance compensation for our wildland firefighters. Every time I meet with our local firefighters in Nevada, they express their concerns to me about the ability to recruit, to train, and retain their workforce. Salaries, benefits, and housing—you talked a little bit about that—are strong components that obviously need greater attention.

So can you please provide me with an update on these previously appropriated funds, and tell us how firefighters are seeing the benefits of increased funding for wildland firefighter compensation?

Mr. MOORE. Thank you, Senator. To date, everything that the firefighters are beginning to see is temporary. The FY24 budget is proposed to make these permanent shifts. In the permanent shifts, it's looking at pay, it's looking at housing, and it's looking at mental care and well-being. And it also would make these pieces permanent. So we are hopeful that this budget will pass as is.

And it's no secret that we have had a recruitment and retention problem, even last year when we were trying to hire up to 11,300 firefighters, we had a lot of issues. And it's geographic in nature in many cases, but in my experience, particularly coming out of California, you know, you had other entities paying two and sometimes three times the salaries that the Forest Service and the Federal Government, really, was paying our firefighters. And these are people that are at the low end of the pay scale that are really on the ground, sucking smoke and dirt for most of the time that they are on this fire. And you know, there is no way that I could ever be okay with what we pay our firefighters and not push, with ev-

everything I have to try and have more of an equitable program and that the wildland firefighters in the Forest Service are well paid, they are well cared for. We are looking out at the communities that we serve and protect, but they can't afford to live in those communities that we serve and protect.

Senator CORTEZ MASTO. So Chief, can I—because I have only got a few minutes. So your goal is, with this fiscal year budget, to make sure that you are increasing that compensation, those benefits, and making that permanent. That's one, correct?

And then you talked about housing and mental health, which are areas that I also want to focus on. What are you specifically doing about the housing issue, and how can we help?

Mr. MOORE. So we have put together a team, a national team to really look at the housing issue. And we are piloting in some areas. The White River National Forest in Colorado is one of the areas where we are piloting a long-term program where we are working with the communities to build houses for our firefighters in exchange for the land. We are very optimistic about that. We are also looking at other areas across the country where we can engage the community into helping us find a solution to this problem because the communities benefit as much as anyone in maintaining a firefighter's support into their communities.

Senator CORTEZ MASTO. So when you say, "in exchange for the land," meaning what, that it is already federal land and you want it cheaply or—

Mr. MOORE. We would lease the land to them for, I believe in this case, it was 50 years or 100 years.

Senator CORTEZ MASTO. It is federal land that you would lease back at a low rate?

Mr. MOORE. Yes.

Senator CORTEZ MASTO. Or no rate to help affordable housing?

Mr. MOORE. Yes.

Senator CORTEZ MASTO. Okay.

Mental health—what efforts are you taking to turn that conversation that I know you had earlier this month—the Forest Service and the Interior Department held a summit to develop mental health resources for fire personnel—now, how are you turning that conversation into action?

Mr. MOORE. So we just started that. In fact, last week, Secretary Vilsack, as well as Secretary Haaland, presented at this meeting that we had in Idaho. We also had a number of firefighting personnel that were present there as well. And at that meeting, we talked about the need for support for mental health care and well-being. And Senator, I have to tell you that in my career, I have seen the underbelly of what can happen when things don't work out right. And I am deeply committed to trying to provide that mental care and well-being, both trauma care as well as when things go wrong, because it leaves a hole in not only the person, but that person's family and the colleagues that they work with. I have scars from that myself, and because of the scars that I have and what I have seen, I am deeply committed to trying to provide this necessary service to our firefighters and our—

Senator CORTEZ MASTO. Thank you. And I know my time is up, but this is essential, not just the compensation and the benefits are key here, but also the housing and the mental health.

Mr. MOORE. Yes.

Senator CORTEZ MASTO. So I would hope you would come back to us to figure out how we can continue to work together on all three of those areas, but at least you are talking about it and that is a key for us really addressing this issue. Now, let's turn it into action. So thank you, Chief Moore, I appreciate it.

Mr. MOORE. Thank you.

The CHAIRMAN [presiding]. Senator Hickenlooper.

Senator HICKENLOOPER. Thank you, Chair, and I admire the new haircut, as someone who got, obviously, their hair cut on the same day, I think, kind of a—

The CHAIRMAN. Just a change of pace.

[Laughter.]

Senator HICKENLOOPER. Mutual admiration society.

Mr. Moore, I appreciate all of your work. Nice to see you again. Obviously, outdoor recreation plays a large role in Colorado's economy. White River Forest, you have talked about several times, with 18 million visitors a year, more than 22,000 jobs, \$1.6 billion in economic impact. I think that, you know, there is a lot of discussion now of opening an office of outdoor recreation. Twenty-two different states have offices of outdoor recreation, most of them connected to their economic development arms. I think commerce might be able to create that office of outdoor recreation, but they would have to work very, very closely with the Forest Service. You are such a large part—you guys and the BLM as well. Is that something you are open to and willing to put in some resources and personnel to try and make sure that if and when this office of outdoor recreation gets stood up, that it can get the support, the interagency support, that it needs?

Mr. MOORE. Yes, and Senator, we would be happy—we always partner with communities and states in trying to really bring recognition to recreation and just the get outdoors type of a feel. You know, you said it, and it's true, outdoor recreation provides a lot of not only economic benefit to this country, but also a spiritual benefit as well, you know, when you are able to get out and recreate. What we have found since the pandemic is that we have a lot more visitors visiting the national forest. We have non-traditional visitors visiting the national forest as well. You know, when the museums were closed, they needed to find somewhere to go, and so they found the outdoors, the national forest as one of those examples.

So looking at recreation in general, it has been underfunded for quite some time now. And as we focus more on recreation and just really providing that release for our American people, we really need to work with all of our partners to help find solutions for how they can get outdoors and enjoy the great outdoors.

Senator HICKENLOOPER. Right, and I could not agree more. Spiritual is a huge part of that value, and health, physical health as well. And in many countries, especially Scandinavian countries, they will, the doctor will prescribe, you know, three walks—three one-hour walks a week in forests to help someone's medical condi-

tion. So thank you for that. I think that is very exciting. And most states now have dedicated people toward trying to find more access points into the national forest. I know Colorado does. Hopefully, we can find some resources within your organization to get more parking lots and not have to spend 12 years doing a survey on that.

The other point I wanted to talk about, you talked a little bit about the affordable housing, and the 50 and 100-year leases. And I think that is a place where all over the country we are seeing this pinch. And I love that the Forest Service is willing to be part of that at the 50 to 100-year leases. I know that sometimes it is hard to keep everybody at the table. In other words, I think that local communities, the counties, the municipalities, all have to step up and contribute what they can and make sure that the value that they are creating stays owned by the community. In other words, that it isn't a 30-year or a 20-year benefit that suddenly becomes private housing. And I know that sometimes that gets in the way of some of your rules and regulations. And I am hopeful that—I am sure you are aware of it—but that we can navigate that.

Mr. MOORE. Yes, we are finding that it is an increasingly difficult situation that we find ourselves in. And that is why, if there is a solution to be discovered in this, we need to do this with the communities. And I think we need to be willing to—everyone needs to put a little skin in the game, so to speak, so that we can find solutions because it is imperative that we have presence in these communities. In order to do that, we are going to need to be able to afford to live in these communities.

Senator HICKENLOOPER. Right, exactly. Great, well, thank you. I will yield back my 30 seconds remaining. That is, I think, the largest I have yielded back, not because I don't have a lot of questions, but the next question would take 20 minutes.

I have three other questions I will submit in writing.

Thank you. I yield back to the Chair.

The CHAIRMAN. Thank you.

I am going to go ahead and give my questions now.

Chief Moore, in the last 18 months, you have received a more than a quarter of a billion dollar increase in annual appropriations. You had an additional \$5.4 billion in the Bipartisan Infrastructure Law. You have had an additional \$5 billion in the Inflation Reduction Act. And I would like to know how you have spent it or how you are going to spend it. This is the third hearing in a row where I am pointing out your agency's ignoring an essential requirement in the Bipartisan Infrastructure Law—to perform work on the ten million acres that your agency previously identified as being the most dangerous and track your progress with specific performance measures. The Forest Service is continuing to ignore both parts of this requirement. The Forest Service is obligating hundreds of millions of dollars, but not in the places required by the law.

So with regard to performance measures last year, NBC News showed the same acres being reported as treated by the Forest Service more than 30 times in four years. Both the GAO and the OIG have said the Forest Service's current measures are "misleading and inaccurate." The OIG noted in their report that Congress and Forest Service management run the risk of making funding prioritization decisions based on inaccurate information. I think

I can speak for all of us that Congress would like to make its funding decisions based on more accurate information, not less accurate. We know we need more proactive management in our national forests to restore their health and address fire risk, but as senators responsible for oversight of your agency, on behalf of all of us as Americans, we demand accountability for funding that we have given you.

So my question would be, do you intend to adhere to the requirement in the law?

Mr. MOORE. Senator, in my opinion, we are adhering to the law.

The CHAIRMAN. You have not given us any reports at all.

Mr. MOORE. We'd be happy to give you any report. In fact, we are keeping weekly reports of what we are able to do and what we are able to get accomplished. So we would be happy to provide you—

The CHAIRMAN. On the ten million acres that are most at risk?

Mr. MOORE. We can give you more than ten million acres, if that is what you wish.

The CHAIRMAN. No, no, the law is very clear. Here is—I will read the law to you, sir, again. I mean, the treatment “of the federal land or Indian forest land or rangeland that has been identified as having a very high wildfire hazard potential, the Secretary of the Interior and the Secretary of Agriculture, acting through the Chief of the Forest Service, shall, by not later than September 30, 2027, conduct restoration treatments and improve the Fire Regime Condition Class of ten million acres that are located in the wildland-urban interface or a public drinking water source area.”

Mr. MOORE. So in the wildland public interface, we have just let a lot of the contract out to the tune of about \$200 million. And we actually pulled together tribal members and state members to look at the first hundred projects that came in for funding. So that has just been completed and we are looking at working on the second round of projects. We sent our proposal out. And I would ask all of your constituents to look at the notice of forest projects that is coming out so that you can compete for those projects.

The CHAIRMAN. Do you have a point person that we can put our Committee staff on?

Mr. MOORE. Yes.

The CHAIRMAN. Because we don't seem to be getting direct answers. We are getting a lot of run around from you all.

Mr. MOORE. Mark Lichtenstein would be the point person.

The CHAIRMAN. Okay. I will have Bryan—he will be right with you, Okay?

My second question: The Forest Service reported that last year it only sold 2.9 billion board-feet of timber, almost ten percent less than it sold two years ago, despite the \$10.4 billion appropriated above ever-increasing annual appropriations. We are producing less. I believe that many states are willing to share their staff and resources with you so they can help you carry out this work. Over the last four years, states have administered the sales for 1.1 billion board-feet of Forest Service timber under your Good Neighbor Authority and they have a proven track record of working. However, I understand that just \$28 million of the Bipartisan Infrastructure Law funding has been allocated thus far for Good Neighbor

bor Authority projects. So I would like the Forest Service to take advantage of the staff and resources that many states have to offer with you in conjunction.

So what portion of the \$10.4 billion that Congress has provided to the Forest Service do you envision the states helping you manage?

Mr. MOORE. So I can't answer that specifically, but what I can tell you though, to your earlier point, is that we have not produced less timber than we have in the past. In fact, we are producing more than we have in the last ten years. Now, we accomplished about 2.9 billion board-feet in 2022. And a part of the reason that we did not accomplish the 3 billion board-feet that was our target is because of so many fires that had happened that burned through some of the timber sales. This year, in 2023, our plan is to produce 3.4 billion board-feet and we are on track to achieve that. And next year, that is going up to 3.5, and then we are working toward a 4 billion board-feet program. So we are, I think, being really productive in that arena.

The other thing that I have done, Senator, for the accountability piece of it, I have given each region a target and we are tracking that target every quarter to see how we are doing in terms of meeting that target. I have just had our mid-year reviews with all of our regional foresters. We are on target to achieve 3.4 billion. We may even go slightly over that.

The CHAIRMAN. So basically, you are not in agreement with the ten-percent less than you sold two years ago? We have those numbers from your—

Mr. MOORE. I am not in agreement that we are producing less than we have in the recent past.

The CHAIRMAN. Those numbers came from your request for your budget.

Mr. MOORE. No, we achieved 2.9 billion board-feet this past year, 2.9 billion.

The CHAIRMAN. Last year.

Mr. MOORE. Yes, last year, in 2022, the fiscal year 2022.

The CHAIRMAN. That was ten percent less than you did two years ago.

Mr. MOORE. Yes, and I am saying the reason we did not exceed that was because of the fires and the storms that took place across this country.

The CHAIRMAN. All right.

Senator King.

Senator KING. I am going to start on deferred maintenance and talk to Mr. Lichtenstein. You have submitted answers, or the Department submitted answers to questions a year ago that you have about \$58 billion worth of capital assets. A rule of thumb is one to four percent of value of capital for maintenance. Yet, your budget this year is, I think, \$100 million. What gives? That's ridiculous. Are you expecting the Congress to bail you out every ten years with the Great American Outdoors Act? You have to stop digging the hole.

Mr. LICHTENSTEIN. No, sir. We do not expect you to bail us out every year. Recognizing that the cost of deferred maintenance continues to grow and the value—

Senator KING. So why isn't there more money in the budget for maintenance?

Mr. LICHTENSTEIN. There are always difficult decisions to make. We are always trying to stay ahead of our——

Senator KING. Yes, and the easiest one is deferred maintenance, but that is not really a cut. All it is, is a moving of the expense further into the future.

Mr. LICHTENSTEIN. Understood. I think we are in the same position as many other federal agencies in addressing our maintenance problems in terms of our overall asset inventory. So we are still working on analyzing our assets to make sure we are having the best assets available to meet those mission requirements.

Senator KING. Well, \$100 million for a \$58 billion asset base is an insult to the people of the United States. So I am hoping that the Administration could take this more seriously because, you know, the Great American Outdoors Act was a heavy lift around here.

Mr. LICHTENSTEIN. Indeed.

Senator KING. And it is not something that we are going to be able to do every two or three years, particularly to make the case to our colleagues that we need more funding for deferred maintenance when the deferred maintenance is getting worse and worse.

Mr. LICHTENSTEIN. And we do appreciate your work with the Great American Outdoors Act. It has made a significant impact on our ability to address those concerns.

Senator KING. Chief Moore, we were talking about harvest levels, 2.9 billion last year. I think in the 80s it was something like 13 billion. Isn't that correct?

Mr. MOORE. Yes, roughly 12 or so, yes.

Senator KING. So explain to me what is going on? I mean, one of the problems, I mean, the forest fire problem, of course, relates to climate and weather and drought and those kind of things, but it also relates to a lot of slash and dead wood and small diameter trees on the ground because of a lack of harvesting. How has harvesting fallen by a factor of five in the last 25 to 30 years?

Mr. MOORE. Yes, sir. If we go back, and you know, it is really taking a historical perspective of the Forest Service and how it was working in the 80s and even prior to the 80s. And I think as a country we were in a different place. I think in the 80s the Forest Service brought in a number of "ologists" if you will, to really look at doing some analysis on the NEPA that was being planned for these projects. And a part of the reason is because we were harvesting timber without the appropriate consideration for the resources.

Senator KING. Do you think we were overharvesting?

Mr. MOORE. Well——

Senator KING. Is there any evidence? Are there any studies that indicate that? If there are, I hope you will supply them to the Committee.

Mr. MOORE. Well, you know, it's more complex than that, Senator. It's a combination of—not now—is that we did not and are not removing the amount of vegetation that we have on the landscape. And that is part of the problem we have with these fires now.

Senator KING. Well, that is what I just said. So why aren't you increasing the harvest?

Mr. MOORE. Well, we are trying—

Senator KING. Why is the harvest ten percent of what it was, no, not ten percent of it, 20 percent of what it was 30 years ago?

Mr. MOORE. Not two years ago, sir. I say our problem is twofold, you know, we are out trying to remove the vegetation. We do the work that we need to lay out the timber sales and then fires sometimes roll through the planned timber sale areas. We also have storms that take place, whether it is in the south, the east or the west, that also blow down areas that we have already laid out for timber sales. So that gets in the way of some of this.

Senator KING. But a reduction from 13 to 2.9 is a huge reduction. We can talk about this more extensively. Perhaps we can meet together to talk about it. But the other piece that sort of relates to this is inventory analysis—knowing what we have got. Last year we worked very hard to get an extra \$10 million in the budget to do that. The current budget cuts that by \$2 million. Wouldn't it be nice to know what it is we have? That is the starting point for knowing what harvest levels should be. Why are we cutting the budget for inventory analysis?

Mr. MOORE. Well, I am saying now we know what we want to do, getting up to about four billion board-feet, which we expect to reach by FY27.

Senator KING. Eisenhower retook Europe in 11 months. I am not sure we need to wait three or four years to decide how much wood we are going to cut.

Mr. MOORE. Well, we have to look at the infrastructure and our capacity and what our ability is. You know, over the last 15 to 20 years, we have lost over 40 percent of our non-fire workforce. And so, if we are looking at building up the vegetation side of the house, we have to rebuild that infrastructure because it is missing. And so we are doing that, but we also are facing a lot of the problems that many others are facing. And I give you an example, last year we hired about 3,400 new employees and we lost 2,600 through attrition. And so, while we are trying to add capacity, there are other things going on where we are losing people through attrition. And so, we are digging into why, but the bottom line, sir, is that we recognize, and the wildfire crisis strategy recognizes that we need to remove more vegetation off the land.

Senator KING. We agree on that. And I understand the workforce. I just came from an Armed Services hearing. Exactly the same problem in the defense industrial base. So workforce is a real problem everywhere, and I do understand that. And I am glad that you are moving forward on that front, but I do think that the combination of the fires and just the value that is being lost to the supply chain is significant. So I appreciate your testimony and your work and hope that we can continue to work together. Anything we can do to help on the workforce problem, you should let us know.

Mr. MOORE. So Senator, can I ask for your support in looking at wood innovations because when I look, you know—

Senator KING. One hundred percent. That is one of the most important things we need to do, things like CLT, for example. I am totally in, yes, sir.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator Lee.

Senator LEE. Thank you very much, Mr. Chairman.

Thanks to both of you for being here.

Chief Moore, in 2018, the Weber Basin Water Conservancy District began planning with the NRCS to try to update infrastructure. The project would repair seven storage facilities that provide water to communities below them, downstream from them. Then in 2019, the same conservancy district began working with the Forest Service as a cooperating agency. Since then, they have needed two time request extensions and the agency is saying that it will likely need to do a full EIS instead of relying on the original EA. So Chief, I have read the applicable law. There is no need for an EIS here. There simply isn't. I will have my staff reach out to yours, but will you commit to emphasizing with your agency that expediency is key with this project, especially as it relates to community water?

Mr. MOORE. I will, Senator.

Senator LEE. Thank you. I appreciate that.

Now, we have seen for several decades a growing reluctance from land managers to permit authorized uses of federal land, often due to just minimal negative public feedback. And we have seen this with timber harvesting, certainly. We have seen it with mining, with grazing, and we have seen it with other activities as well. And we are also seeing it with recreation. Just this month, the Flagstaff Ranger District in Arizona canceled plans to issue seven new permits to commercial guides just because some people wrote in concerned about jeeps overrunning the area. But unfortunately, they completely missed the mark. The people who wrote in did not seem to be informed at all by the actual proposal, which included rock climbing, mountain biking, and birding guides.

So what can we do to increase the resiliency of our district offices to ensure that would-be users of public land are not kept out by nimbyism, especially, in some cases, uninformed nimbyism?

Mr. MOORE. Yes, sir. I am not familiar with that particular case that you brought up, Senator, but I will certainly look into it and get back with you on that.

Usually, in a case moving from an EA to an EIS, it is really around an issue of significance, and I don't know what that might be without looking into it.

Senator LEE. Yes, if you take a look at 16 U.S.C. 1133(d)(4), I think it's there, but my staff will touch base with yours to compare our arguments.

Mr. MOORE. Great.

Senator LEE. And thank you for your commitment on that.

Timber harvesting, I want to get back to that for a minute. I share concern expressed by others here today, and Senator King and I agree in a number of areas, and I think this is one of them. It is critical to managing our landscapes effectively and it plays a really important role in the economies of rural communities, especially where there are lands that you manage. Unfortunately, timber outputs are far below the Forest Service's allowable sales quantities. What steps do you think that the Forest Service needs to

take in order to attain harvests at the allowable sales quantities or even probable sales quantities?

Mr. MOORE. Yes, Senator, there has been a lot of concern over the years with our ability to remove vegetation. Part of it is resources, both money and people, that we have not had. With the bill and IRA, we have an opportunity to really increase the amount of work that we are doing to remove vegetation because we have said that that is one of the primary causes of the fire situation—disease, and insects that we have, particularly across the West—is our inability to remove the amount of vegetation that is necessary in order to have positive effects on fire behavior. So our wildfire crisis strategy is really designed around removing vegetation, and that is why we want to emphasize wood innovations, because a lot of our traditional mills don't have the capability to use small-diameter, low-value material.

So part of the bill monies have been used to retrofit some of our mills to be able to handle that. All of this to create new opportunities through things like, as was mentioned earlier, cross-laminated timber, biochar, biofuels, some of those types of things that we can begin to use. And we are seeing a lot of successes in both of these areas. And so we are really optimistic that we will be able to provide a lot more of the vegetation—our resources that we have not, in the past—and we are still trying to build capacity. We are having unique agreements with counties and states to really get at adding capacity where county and state officials are helping us with timber sale layouts, marketing, and some of those types of things. And so, we are creating non-traditional partnerships with a lot of our folks at the local level. RC&D is another area where we are partnering with the resource conservation districts to do some of the NEPA work.

So we are exploring that.

Senator LEE. Thank you, Chief Moore. I see my time is expired, but I do want to thank you for your commitments on those, and I hope you will continue to look at them. I do think that we are onto something here about the timber harvesting. I think that if you do that right, it can help you with the wildfire problem. It can help you achieve balance when it comes to the stand density index, and if you mess up the stand density index, you are at greater risk for wildfires and it also tends to contribute to drought in states like mine. So thank you very much.

Mr. MOORE. Thank you.

The CHAIRMAN. Thank you.

It's your turn, I think.

Senator Kelly.

Senator KELLY. I am up, thank you. Thank you, Mr. Chairman. And Senator Lee, thank you, perfect lead-in to my question on timber harvesting as well and on 4FRI.

In Arizona, the Four Forests Restoration Initiative is finally underway. It is getting into its implementation phase, and we are going to do this landscape-scale restoration of the biggest ponderosa pine forest on the planet. So what does the timeline for implementation look like, and are there any anticipated roadblocks? And if there are, what are we going to do to get ahead of them?

Mr. MOORE. So this year, 2023, Senator, the forest—and I say the forest, but it is the four forests that comprise 4FRI—receives about \$42 million from bill funding and they are currently implementing timber, fuels, roads, and bridge projects to support that land restoration project that we have been talking about earlier. Also included in that is about 47,000 acres of mechanical thinning and we are putting a contract out this year. We also have, in addition to that, about 17,000 acres of hazardous fuel reduction, and we are also planning to do about 100,000 acres of prescribed burning to complement that.

Senator KELLY. So you got the contracts on the 47,000 acres this year, and right now, my understanding is the infrastructure needed to do this work is currently underway.

Mr. MOORE. We believe so. We are constantly hiring personnel because that seemed to be one of our biggest challenges there on bringing people on with the experience level that we need at that journey level. And you know, it takes time to train them, but one of the ways that we are supplementing that is by developing unique partnerships with some of our county and state officials to provide some of that expertise to work for the common good between the state, feds, and local level.

Senator KELLY. Okay, thank you.

And since we are speaking of workforce, the firefighter compensation reform package included in the Forest Service FY24 request aims to help the workforce for the wildland firefighters by increasing—let me say permanently—increasing their pay, improving mental health and physical health support, and expanding housing options. So Chief, if the proposed FY24 firefighter compensation reform package is not passed in Congress in this session, what would be the impact on the wildland firefighter workforce, and what would you have to do to mitigate for the downside of this?

Mr. MOORE. Yes, excellent question, with a disaster of an outcome, Senator. I—

Senator KELLY. Literally, a disaster, I mean, because we are talking about, you know, wildfires that are natural disasters.

Mr. MOORE. And we are talking about having a workforce that can respond to these fires. We have seen on a number of occasions where whole communities have burned. If you don't have a workforce in place to be responsive to these fires, then you are going to see more of that sort of thing happening, God forbid. And so we think it is imperative that we are able to respond to these issues around our firefighter needs if we are going to have a workforce that is going to be responsive to our community needs.

Senator KELLY. Well, thank you.

One last question, Chief. Last Congress, Senator Romney and I introduced the Wildland Fire Mitigation and Management Commission Act, which was signed into law as part of the Bipartisan Infrastructure Law. This established a commission of federal, state, and local stakeholders to study and recommend new fire prevention mitigation management and rehabilitation policies for forests and grasslands. And earlier this year, we saw the commission release the first part of their recommendations. And the full report is due in September. Is this timeline of the full report coming out in Sep-

tember correct, and how will the Forest Service work to evaluate and incorporate the recommendations of this commission?

Mr. MOORE. I believe it will meet its intent. I, you know, we—while we are not directly involved in it, we are involved from a distance. And we feel that so far, from what I know, what we know, that these are good recommendations coming out of the commission.

Senator KELLY. And you feel like you will be able to implement them?

Mr. MOORE. I certainly hope so. But, you know, it is all going to boil down to whether we are funded to implement a lot of these types of issues, but the interest is there, the motivation is there. It is just a matter of do we have the resources to match that.

Senator KELLY. Okay, thank you.

The CHAIRMAN. Thank you, Senator.

And now, we have Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Chief, good to see you again. Second time in a month, I guess, here. Last month, at the appropriations discussion, I asked you about tribal co-management and the Forest Service. Many of the tribes in Alaska, as you know, are leaders in self-governance. They are very interested in the opportunities that can be presented through tribal management and through co-management operations, specifically on the 638 contracts. So we have a farm bill in 2018 that authorized the 638 contracting for tribal forest restoration projects, but as we discussed, that authority is limited to projects on federal lands that are bordering on or adjacent to Indian forest or rangeland. So we did get some technical assistance from USDA that can perhaps help address these geographic limitations, but we are also trying to figure out a way to expand 638 contracting and compacting to some additional activities.

So the question to you and your team is whether or not we will have the information or the legal reviews that we need to fix the existing 638 contracting authority that was in that prior farm bill to be able to extend it, to be able to allow for compacting so that we can utilize this in Alaska. Can you give me an update or a heads-up on that?

Mr. MOORE. I think that USDA may be a better source to provide that information, Senator. I don't have it.

Senator MURKOWSKI. Okay. I think that maybe this is an issue where both of you think that the other one is doing it. So let's follow up on this. Afterwards, we will connect with USDA as well, but I just want to make sure that we do not miss this window. We have the farm bill coming up. This, obviously, is an area of interest, not just for us in Alaska, but others as well, so.

Mr. MOORE. And I would agree that this would be important, and I think it would be, really, a good addition.

Senator MURKOWSKI. Good. Thank you. Let's work on that.

I also mentioned at the last hearing the Southeast Alaska Sustainability Strategy and USDA's initial commitment there—\$25 million to address the situation in the Tongass. When this was announced—the \$25 million was announced in July 2021—it was underscored at that time and reinforced that this was an initial commitment to the region. Can you share with me where the Forest

Service is with requesting additional support for the Southeast Sustainability Strategy in the President's budget?

Mr. MOORE. I do not believe it is specifically marked out in the President's budget, Senator, but we do plan to provide resources to that project.

Senator MURKOWSKI. Can you share with me any expectation in terms of a timeline or what you are thinking about in terms of time and what the communities in the region might expect?

Mr. MOORE. So I will commit to you this year, yet, in terms of the specifics, I will follow up with you on that, but I will—

Senator MURKOWSKI. Okay, well, again, we have communities that, as you know, are struggling, as we have seen, yet one more round of imposition of the Roadless Rule and the limitations that that provides—I don't think that \$25 million is adequate to address the decline that we see within the industry there, the timber industry in Southeast, and I think those of you in the Forest Service have concurred with my assessment of that. And so, there have been a lot of promises, but we really have not seen beyond that initial announcement that there has been additional follow-on. And so, I will keep pressing to make sure that you know that Alaskans were led to believe that that was an initial commitment to the region and that there will be more to come.

One—

Mr. MOORE. Before you leave that one, Senator, can I follow up with you next week?

Senator MURKOWSKI. Yes.

Mr. MOORE. With the specifics of that.

Senator MURKOWSKI. Yes, I would look forward to that. Thank you, Chief.

And then, last question here—I have also raised previously—the local hire and the incorporation of local knowledge in land management is super-important for us in Alaska, but particularly, empowering our tribes to partner as wildland firefighters is a pretty powerful tool for that. So any updates on what the service is doing to recruit and retain more tribal partners?

Mr. MOORE. Yes, actually, I was just told recently that we have just hired 100 of our tribal partners and we are still going off of other opportunities for potential, but the region has been very optimistic and very happy to be able to bring that many of their tribal members on board. And so—

Senator MURKOWSKI. Good. Well, maybe as we do a follow-up in the next week or so on these other issues, you can provide me a little more detail on where we are seeing those additional hires. That is good news.

Mr. MOORE. I would be happy to.

Senator MURKOWSKI. Good.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Senator MURKOWSKI. Thank you, Chief.

The CHAIRMAN. Senator Barrasso.

Senator BARRASSO. Thanks, Mr. Chairman.

A couple quick things, Chief Moore. On March 30 of this year, the Bureau of Land Management of the Department of the Interior issued a proposed rule that seeks to lock Americans out of their

public lands, effectively upending the agency's multiple-use mandate. This proposed rule was devised and written without any input from critical partners and leaders on the ground. So Wyoming families, our local economies, depend on access to public lands for energy and critical mineral development, for grazing, for forest and timber management, and recreation. So what I ask you is, to your knowledge, is the Forest Service or the Department of Agriculture in any way devising a similar rule for national forests and grasslands?

Mr. MOORE. No, Senator, we are not.

Senator BARRASSO. Great.

I want to follow up a little bit with what Senator King was talking about. The budget request that you came out with includes a \$2 million cut to the roads line-item. I have it right here, under capital improvements and maintenance. So when I go to this \$2 million cut and read under it, "forest system roads and bridges provide access for first responders in emergencies." Your own report says that a decrease of \$2 million, which you are proposing, cutting it by \$2 million, would reduce the capital improvements, would reduce maintenance on roads, maintenance on bridges, and it could negatively affect priority access work for fuel reductions and watershed health. All right.

So you say you cut \$2 million and we know it is going to be bad because it is going to cause these hardships. At the same time, your budget increases the facilities line-item by \$71 million, of which \$60 million is for electric vehicle charging infrastructure—\$60 million for electric vehicle charging infrastructure—but you are willing to cut roads and bridges for our first responders, for fuel reduction, and for watershed health, which is only, you know, which is \$2 million. You know, you look at this and say, why is the Forest Service prioritizing electric vehicles over public safety and fighting forest fires and allowing first responders access to the area?

Mr. MOORE. I would never agree that it is a matter of choosing between the two. I think it is always just trying to balance out, you know, emerging issues. And when we look at recreation and increased visitor use and we look at some of the trends that are occurring in this country where more and more electric vehicles are being purchased, then we also want to be able to try and provide resources, not only for that trend that we see in America, but also for our vehicles that we are starting to purchase that are electric in nature. So when visitors come to our national forests and our recreation facilities, we, in some locations, are wanting to put in plug-in opportunities so that they don't incidentally get stranded along the way.

So it is just a trend that we are trying to be responsive to, Senator.

Senator BARRASSO. Well, I won't want to make it be a trend that we are willing to give up on fuel reduction and watershed health.

Mr. MOORE. Yes.

Senator BARRASSO. I mean, you should have thought, well you could have said, well, let's just not do that and only put \$58 million into the other issue, but you did not choose to do that. You did—the trend is to get rid of what we think we need is really important to do something. I would just say, look, I know that President

Biden is singularly focused on forcing every American into an electric vehicle, no matter the cost, no matter the consequences. That is his big deal. I would hope that you are going to fight against the rest of the Administration's efforts to prioritize EVs over saving lives, over saving property, over forest health. If a loss of life and property is not enough to convince the Administration, maybe you can remind them that wildfires release massive amounts of carbon into the atmosphere and preventing a forest fire, getting earlier access in there, is going to have a much bigger impact on carbon emissions than the vehicles coming into the forest. I mean, it just seems ridiculous.

Mr. MOORE. It sounds like you are making a statement, sir, not necessarily a question?

Senator BARRASSO. Well, I would ask you, does what I am saying make sense in terms of what you want to do for forest health?

Mr. MOORE. Well, I think it is really vitally important for us to really look at forest health. I mean, we have a significant problem out there and I have testified earlier that, in my opinion, we are in an emergency situation out on our lands and that we need to prioritize it. And I think we are, to a large degree. We said that this is an emergent situation. We are using all kinds of tools to indicate that it is an emergent situation. And I think that we are providing as much attention as we possibly can on this issue that we have out on our public lands.

Senator BARRASSO. But certainly, it seems to me, that in terms of what may be an emerging trend years from now, mandated by the Administration—clearly not needed for the emergent situation that I have heard you describe today—it does seem that there is a reallocation issue that I would prefer had gone a different direction.

Let me just—one other area. In addition to managing forest landscapes, the agency also manages rangelands and grasslands. Ranching families in Wyoming and across the West partner with the Forest Service to ensure good stewardship over all of these lands. Revenues generated by grazing fees that are paid by our ranchers go into the Range Betterment Fund. This fund is used to help keep our range and grasslands in a healthy condition. My legislation, the RANCH Act, would effectively double this contribution without raising grazing fees or the deficit. The agency could be matching our ranchers' contribution with its own funds. This would demonstrate a more meaningful commitment from the agency to help improve rangeland health.

Why isn't the Forest Service matching the funds that are put into this program by the ranchers?

Mr. MOORE. I am not familiar with that part of it, Senator. We certainly feel that range management is critically important, and particularly out West. And so I would be happy to sit down with you to get ideas from you on what you think we could and should be doing.

Senator BARRASSO. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator.

I have just one final question and then we will wrap up. But Chief Moore, I noticed you are requesting a \$52 million increase in

your IT budget in order to accommodate telework. I believe in physical attendance. You don't agree with that?

Mr. MOORE. I would like for you to finish.

The CHAIRMAN. Well, I mean, it is just horrible, people got to come to work. They are not coming to work. That's in a nutshell. Just make me understand why you think they should be spending \$52 million to make sure they don't come to work.

Mr. MOORE. So the reason I was looking there, and I am not familiar with the \$52 million to come to work. What I will say is that OMB announced last week the order to come back to work. And so what we are doing now within the Department of Agriculture is working to develop a plan within the next 30 days to see what that would look like. In my case, for the Forest Service, within the Department—what that would look like for the agencies within the Department. We just recently put a team together as of this week and we have begun to work on what that would look like—coming back to work, what that would look like.

The CHAIRMAN. I'm just saying, we just picked it up out of your budget. It said \$52 million for IT, which I assumed was going to be computers for people to take home and work from. Is that—

Mr. MOORE. Yes, ideally, if we are going to be working from home, you know, we need to provide the resources available to work from home, but keep in mind that that was there before this decision was made last week, and so we are going to have to make some adjustments based on the new decision that was made as of last week.

The CHAIRMAN. Yes, well, you all can check it in your own request. It's pretty plain.

Mr. MOORE. I am saying that request was before the announcement that was made last week, and so now we will have to adjust that.

The CHAIRMAN. Okay, well, let me make sure that you understand that a lot of us up here are hearing from groups that long partnered in past administrations for the Forest Service. They are telling me part of the reason that the Forest Service is not hitting so many of its targets is because employees are not coming to work.

Mr. MOORE. But I would say—

The CHAIRMAN. It's not just in the Forest Service, sir. We are hearing it across the board.

Mr. MOORE. But I—

The CHAIRMAN. Yes, go ahead.

Mr. MOORE. I'm sorry. I would say that that is not true. In fact, our productivity has slightly increased. And keep in mind, Senator—

The CHAIRMAN. You ought to tell these people that—

Mr. MOORE. A lot of our field-going people were never really teleworking or remote working. They have been working through this entire pandemic. Where that has happened to a greater degree has been in our regional offices, our station offices, and our national headquarters. It is where that has been, generally. So the field-going, at that forest level and district level, has always been at work—

The CHAIRMAN. Well, I am not talking—yes, I know what you are saying. As far as that goes, you are always going to have your field

work. We understand that. We are understanding that basically a lot the phones are not getting answered, not just in yours, but so many agencies across the Federal Government. Reports are not being filed. Timeliness as far as getting anything done, people are waiting longer periods of time for any type of permit process or procedure just because people are not showing up. You can take the IRS all the way through the Federal Government and we are throwing money at it from this standpoint. I don't know if it's going to improve unless people are required to come to work or find another job. That's about it.

So with that, I will stop it there.

I want thank you all, again, for coming.

Members are going to have until the close of business tomorrow to submit additional questions for the record.

And the Committee will stand adjourned.

[Whereupon, at 11:37 a.m., the hearing was adjourned.]

APPENDIX MATERIAL SUBMITTED

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Questions from Chairman Joe Manchin III

Question 1: I understand that 99 of the Forest Service's 128 Land Management Plans are more than 15 years old and therefore legally out-of-date. Even more concerning is that under the current regulations, only 11 National Forests have revised their Land Management Plans over the last 11 years. This year's Forest Service budget request includes an additional \$5 million to stand up a new internal group in your organization to try to begin working through the backlog of these outdated Land Management Plans for the National Forests. Under this new proposal, how many of the expired Land Management Plans will you be able to bring into compliance over the next 15 years?

Response: The Forest Service is grateful for the support from the funds in the Bipartisan Infrastructure Law and Inflation Reduction Act. The Inflation Reduction Act provided \$8.5 million and the Bipartisan Infrastructure Law provided \$100,000 in Fiscal Year 2023 to launch the Planning Services Organization, an agency group that works to begin addressing the backlog of older National Forest and Grassland Land Management Plans. We have established an aggressive schedule to revise our plans with a goal of bringing up to 75 of the 128 plans up to date over the next 15 years. There is significant work ahead as we stand up the Planning Service Organization to fulfill the Forest Service's commitment of developing timely, contemporary plans that address pressing challenges including wildfire risk, sustainable recreation, and a changing climate.

Question 2: Completing accurate inventories of our forests and their carbon stocks is the first step in monitoring the impacts of our landscape restoration efforts. Rwanda, earlier this year, became the first country in the world to have a national inventory of all of its 350 million trees. With the assistance of researchers at the University of Copenhagen, Rwanda now not only has the measurements of every tree located in and out of their vast, dense forests, they also have tallied their carbon stocks. Advancements in computer and remote sensing have enabled them to accomplish this, and I understand their methodology is being published in a prominent scientific journal because it continues to yield good results when applied to other countries. Right now, the Forest Service sends crews in every five or ten years to measure 355,000 sample plots across the country using the same techniques foresters used 100 years ago. With this new technology available to us, should we use an approach similar to what other countries are using to measure the estimated 228 billion trees in the United States?

Response: The Forest Inventory and Analysis (FIA) program of the USDA Forest Service is the Nation's forest census, tracking the status and changes of forest resources for more than 90 years. The FIA program currently uses remote sensing imagery for sampling efficiency and to improve forest inventory estimations. The FIA program continues to work with university, industry, and other Federal partners to evaluate new geospatial and remote sensing technologies, applying them to existing inventory protocols as appropriate, and working with scientists around the world. Our Interior Alaska survey is conducted in partnership with NASA. Remote sensing specialists are always looking to use the FIA plots for calibration, validation, or to provide information the observations cannot provide. U.S. forests have over a trillion trees if tree seedlings are counted as trees. We would appreciate being able to brief the Committee on how the FIA program uses these technologies and contributes to advancing remote sensing technologies.

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Question 3: Your budget justification states that you have three GS-1 employees. What is the job series and duty station for each of these three employees?

Response: At this time, the Forest Service employs five GS-1 employees—three on temporary appointments with a not-to-exceed date, and two on permanent appointments. Here are their job series and duty station:

OCCUPATIONAL SERIES	POSITION TITLE	APPOINTMENT TYPE	DUTY STATION
0462	FORESTRY AID	Temporary	TROY, MT (KOOTENAI NATIONAL FOREST)
0404	BIOLOGICAL SCI AID	Permanent	DRY BRANCH, GA (SOUTHERN REGION)
0099	STUDENT TRAINEE (GENERAL)	Temporary	WALDRON, AR (OUACHITA NATIONAL FOREST)
0303	ADMINISTRATION CLERK	Permanent	MADISON, WI (FOREST PRODUCTS LAB)
0303	CLERK	Term	CORVALLIS, OR (PROPERTY AND PROCUREMENT SERVICES)

Question 4: Your budget justification states that the Forest Service had 64 Senior Executive Service (SES) employees in 2021, have an estimated 122 SES employees in 2023, and will have 129 SES employees in 2024. Please list the job title and duty station for each of the current 122 SES employees and the 7 additional employees you anticipate having in 2024.

Response: Unfortunately, table FS-8 in the FY 2024 Congressional Budget Justification contained an error and in actuality the Forest Service currently employs **50** Senior Executives, with **6** additional SES positions to be filled as soon as possible. The positions are all listed in Attachment 1. The job titles and duty stations are outlined in the attachment, the 6 positions to be filled are highlighted in yellow.

Questions from Ranking Member John Barrasso

Question 1: At the hearing, I mentioned how ranching families in Wyoming and across the West partner with the Forest Service to ensure good stewardship over rangelands and grasslands managed by the Forest Service. Revenues generated by grazing fees that are paid by our ranchers go into the Range Betterment Fund. This fund is used to help keep our rangelands and grasslands in a healthy condition.

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- a. In addition to funds utilized from the Range Betterment Fund, what specific line-item investments is the agency making to help improve rangeland health?
- b. If there are specific investments, how do they compare with the contributions made by ranchers that go into the Range Betterment Fund? Are they more or less, and by how much?
- c. In recent years, have line-item investments intended for rangeland health been diverted to other accounts or towards other agency initiatives? If so, please be specific.

Response: (a): The FY2022 Valleys and Headwaters Restoration Joint Chiefs' Landscape Restoration project on the Medicine Bow-Routt National Forest is an example of a project improving rangeland health funded outside of the Range Betterment Fund. The project will make a number of improvements, but we want to highlight the enhanced rangeland resilience alongside the protections for municipal water supplies, hazardous fuel mitigations, and a suite of other landscape scale restoration efforts.

Every region with a grazing program receives allocations that allow us to make investments in rangeland health within the scale of the appropriation.

(b): Rangeland health is funded by both Grazing Management and the Vegetation and Watershed Management budget line items. The Grazing Management line item was appropriated at \$6.3 million in FY 2023 and supplements the \$2,863,000 contributions projected in the FY2024 budget made by ranchers to the Range Betterment Fund. Grazing fees are collected by Grazing Year, which runs from March 1 – Feb 29. The Vegetation and Watershed Management fund is a program that is shared by multiple programs to benefit watershed condition and improve or restore forested and rangeland ecosystems.

(c): As indicated in (b), the Vegetation and Watershed Management budget line item is a shared funding source across multiple priorities, including wild horse and burro management, invasive species mitigation efforts, and watershed management work

Question 2: At the hearing, you spoke about issues that the Forest Service faces in regards to recruiting, hiring, and retaining qualified employees.

- a. In your view, what are the main impediments to recruiting, hiring, and retaining qualified employees?
- b. Would changes to the federal hiring process fix these issues? If so, please explain what changes.
- c. Are there additional authorities needed to fix these issues?

Response: (a): An additional hiring challenge relates to pay disparity; an issue felt acutely by the Forest Service's wildland firefighter workforce. This challenge prompted the Administration to propose legislation authorizing a special base rate salary table that would permanently increase base pay for Federal wildland firefighters and would create a premium pay for all wildland fire incident responders to provide additional compensation for all hours they are mobilized on incidents. These pay reforms would provide a more livable wage and address long-term competitiveness and equity issues to ensure stable recruitment and strong retention.

(b): The Forest Service is utilizing all available authorities and programs to hire and retain qualified employees, including direct-hire authorities, the pathways program, recruiting applicants from Tribal nations and graduates of Job Corps programs, and aggressively soliciting applications from veterans.

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The Forest Service is working collaboratively with the Department of the Interior and the Office of Management and Budget to address agency workforce housing issues. The agency is grateful for your interest in addressing this issue and looks forward to working with your office.

Question 3: At the hearing, you spoke about challenges related to employee housing.

- a. Please explain what regions are most impacted by this issue.
- b. What additional authorities are needed to fix this issue?
- c. Where appropriate, would the use of federal land for housing units help alleviate this crisis?

Response: (a): Housing is a nationwide issue for the agency. The Forest Service's fiscal year 2024 budget includes a \$50 million investment in facility maintenance for safe, affordable, local housing to provide Agency employees with an appropriate standard of living, strengthen their relationships in the communities they serve, stimulate local economies, and reduce long commutes. This investment is a component of the Administration's wildland firefighter workforce reform proposal.

The Forest Service is working collaboratively with the Department of the Interior and the Office of Management and Budget to address agency workforce housing issues. The agency is grateful for your interest in addressing this issue and looks forward to working with your office.

(c): There is an appropriate use of federal land for housing units to help alleviate housing issues.

Question 4: What barriers does the Forest Service experience in deploying broadband on the land it manages and, in your view, what additional authorities are needed to more efficiently do so?

Response: There are various reasons for delays in granting applications for communications uses, including broadband. Competing priorities of resource specialists and capacity issues make it difficult to complete the requisite environmental analysis and comply with applicable consultation requirements within 270 days, as required by the MOBILE NOW Act. Apart from the issue of insufficient resources, the Agency is not always able to control the timeframe in processing applications. Some of the more common reasons for delays include:

- Filing of an application when the area proposed for use is inaccessible due to weather conditions, which causes delays in conducting onsite Agency surveys required for environmental analysis.
- Failure of the applicant to submit processing fees. Per Forest Service regulations, the agency cannot begin processing an application until processing fees are paid.
- Delay of application processing due to changes requested by the applicant after the application has been accepted and environmental analysis has begun. Some of these requested changes have been due to supply chain issues.
- Inability of the agency to control the processing timeline when the applicant contracts with a third party for preparation of the requisite environmental analysis and the analysis is delayed.

The Forest Service welcomes the opportunity to explore with Congress additional means of meeting capacity challenges facing the Forest Service in delivering its broadband program on NFS lands.

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Question 5: The Infrastructure Investment and Jobs Act (IIJA) was signed into law in November of 2021, almost 16 months ago. Has the Forest Service finalized guidance on how to use the Emergency Actions authority created by Sec. 40807 of that Act?

Response: The IIJA section 40807 provides that any required environmental assessment or environmental impact statement for an authorized emergency action requires analysis of only the proposed action and the no action alternative and is not subject to the “objections” process at 36 CFR Part 218. In December 2022, the Secretary made an emergency determination on the 250 high-risk fireheds and identified post-fire recovery areas to authorize strategic use of BIL NEPA Authority. Since that time, the Chief has approved 39 emergency actions covering approximately 1 million acres. Each of these projects are currently being reviewed under an EA or EIS which are at various stages of completion. We anticipate many of these analyses will be completed in 2024 when projects can be competed and begin implementation. The Forest Service’s Washington Office continues to provide guidance and instructions to field units concerning implementation of this provision.

Question 6: The IIJA also authorized a categorical exclusion for fuel breaks on National Forests. It is my understanding that, to date, eight projects have been approved using that authority. When can we expect to see more fuel breaks?

Response: As of December 18, 2023, approximately 51,689 acres have been treated with the Bipartisan Infrastructure Law’s categorical exclusion (CE) for fuel breaks. The most recent Decision Memo was signed on December 15, 2023. The Agency has 59 projects that rely on the Fuel Breaks CE category. Specifically, 36 projects are in developmental stages and 23 have a signed decision memo.

Questions from Senator Martin Heinrich

Question 1: As you know, northern New Mexico experienced the devastating Hermit’s Peak/Calf Canyon Fire last spring. We just passed the one-year anniversary of that fire, and the communities in the area are still in the very early stages of recovery.

- What is the plan for long-term restoration? With the BAER team ending, how will long term restoration be planned and funded?
- How are you prioritizing infrastructure repair projects? Some people still cannot reach their homes because of washed out forest roads.

Response: The Forest Service recognizes that this was a devastating fire for so many communities and we are working side by side with our neighbors and our sister USDA agencies for the long term. The Forest Service is an active member of the State of New Mexico’s Post Lines of Effort for recovery with the Federal Emergency Management Agency (FEMA). This unified effort is addressing recovery efforts across all lands affected by FY 2022 fires, including Hermit’s Peak / Calf Canyon. Activities include:

- The agency’s Hermit’s Peak / Calf Canyon fire incident management team received \$7M in BAER funds for aerial mulching on 3,000 acres, seeding over 9,000 acres (with BAR funds), storm proofing and repairing roads, and installation of road closure and hazard warning signs. The Forest Service completed this work last summer.

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- The Forest Service received over \$10M in Burned Area Rehabilitation (BAR) funds for additional road and trail repair and minor facilities repair, including almost \$6M for allotment boundary fence repair. This work is currently underway with multiple contracts and agreements.
- In addition, the Region received \$49M in Disaster Supplemental funds. The Forest Service is developing long-term restoration priorities, and projects with the State and FEMA and our USDA partners; The funding and long-term work is focused on firewood distribution, rangeland restoration and fence restoration, road and bridge reconstruction and replacement, acequia and ditch repair, hazard tree removal, forest restoration through salvage and reforestation, revegetation of plant communities, water diversion structures and channel repair, and repairing recreation infrastructure.
- For the past year, the Forest Service and USDA alongside the National Resource Conservation Service (NRCS), the Farm Services Administration (FSA) and the Rural Development program have been actively participating in firewood distribution, allotment assessments and fence replacements, roadside hazard tree removal, timber and agricultural industry recovery, watershed stabilization, and acequia and infrastructure repair.
- The Forest Service is currently partnering with the NRCS through a newly signed Memorandum of Understanding between the two agencies that allows us to better work with the State of New Mexico for a broad-scale effort to address headwaters stabilization needs for National Forest System lands and downstream private lands to mitigate as much as possible impacts from flooding.

Infrastructure repair project initial evaluations were prioritized for safety. As work continued and conditions improved, crews were deployed to open more roads. At present, the Agency is aware of some residents who do not have access to their primary residences, and the Agency is working expeditiously to find remedies and to repair of these roads. Maintaining access to these primary dwellings and inholdings is a top maintenance priority.

Question 2: Last fall, I and other members of the New Mexico delegation wrote to you asking you to begin the process for an administrative mineral withdrawal for the Upper Pecos Watershed. I received your response to that letter last week, which says the Forest Service is assessing the need for a withdrawal and whether current laws and regulations can adequately protect the watershed.

- Can you explain what your assessment process is for this, and how local farmers, elected officials, residents, and tribal leaders can be involved in that assessment?

Response: We recognize the significant interest in a withdrawal in the Pecos watershed and appreciate everyone's commitment and energy. We are working on pulling together the information necessary to include in a withdrawal package. We are also very appreciative of the offer of resources from outside partners to aid in this work. The Bureau of Land Management will review the withdrawal package once submitted by the Forest Service, and upon acceptance, will initiate a public engagement period including issuance of a Federal Register Notice and public meetings.

Question 3: The appropriations bill passed in December required the Forest Service to examine ways to improve the appraisal process for land acquisition projects and required a report to Congress within 90 days.

- Did the Forest Service submit the report on improving the appraisal process that was due a few weeks ago?

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Response: The Forest Service briefed the committees' staff on May 15, 2023, and the follow-up report was transmitted to Congress on September 8, 2023.

- What strategies is the Forest Service pursuing to improve the timeliness of appraisals?

Response: The Forest Service is working on improving the timeliness of appraisals in a variety of ways including policy updates, appraisal contracting improvements and project tracking enhancements. Policy updates provide guidance to address regional inconsistencies in communicating and collaborating with third-party partners. We have been working with our Procurement and Property Services staff to streamline the appraisal contracting process. This includes the ability to utilize micro-purchasing to procure appraisal services that are under the \$10,000 threshold via a government purchase card without the need to go through the contracting process, saving time and resources. When appropriate, we can work with our third-party partners to facilitate the contracting of appraisal services. In FY 2024, the Forest Service will develop a software application to better monitor appraisal projects in real time. This will enable us to track the appraisal process and identify potential areas for improving efficiency. Over time, this application will help us establish a baseline timeframe for appraisals, from which we can further assess future needs for improvement. Combined, these strategies will strengthen our collaborative partnerships and support consistent and efficient delivery of appraisal services.

Question 4: LWCF funding is now guaranteed and predictable.

- How quickly is the Forest Service able to move to closing on projects?

Response: On average, a land acquisition project takes 1-3 years to complete. Guaranteed and predictable funding afforded through the Great American Outdoors Act enables us to begin the project evaluation process earlier. By evaluating our projects earlier, we hope to reduce the overall project timeline by an estimated six months. Project completion is also influenced by external and sometimes unpredictable factors, such as complex title issues. Projects that encounter external barriers will take longer to complete or may be cancelled and the project funds recast to a viable project.

- For 2021 and 2022, how much of the Forest Service's Land Acquisition budget from LWCF has gone out the door, versus projects that are still in the closing process?

Response: Below is a table of the FY2021 & FY2022 amounts spent, based on the most recent financial system trial balances and regional spending plans (as of 1/8/2024).

Program Name	Funds Appropriated	Balance: 1/8/2024	Funds Spent: 1/8/2024	Closings Planned FY24 Q2	Planned Fund Balances
Acquisition Contingency	\$6,000,000	\$774,000	\$5,226,000	\$543,000	\$231,000
Critical Inholdings	\$15,000,000	\$9,109,413	\$5,890,587	\$2,262,240	\$6,847,173
Core Projects	\$168,315,000	\$97,866,307	\$70,448,693	\$3,293,122	\$94,573,185
Recreation Access	\$34,000,000	\$21,417,181	\$12,582,819	\$3,146,647	\$18,270,534

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Question 5: I am very concerned about process bottlenecks that frustrate the agencies' abilities to get deferred maintenance projects done in a reasonable amount of time using funding from the Great American Outdoors Act.

- For the Legacy Restoration Fund, which provides funding to address deferred maintenance projects, what percentage of fiscal year 2021 and 2022 funds do you have under contract?

Response: The Forest Service is grateful for this funding, and it is absolutely critical for the Agency. As of mid-September, the Forest Service has completed 156 of the 995 Legacy Restoration Fund projects appropriated from FY 2021-2023. Another 389 projects are under construction and 91 have awarded contracts. Of FY21 projects, 81% of projects are under contract, work in progress, or completed. Of FY 22 projects, 50% of projects are under contract, work in progress, or completed. To date, \$289 million has been obligated to contracts. While contracting is a major means of project implementation, the Agency is also completing projects through partnership agreements and force account (implemented with Forest Service personnel, e.g., trail crews). In addition to the contract obligations, an additional \$129 million has been obligated to more than 500 partnership agreements.

Many of the projects funded in FY 2021 or FY 2022 required planning and design, and were not expected to be ready for construction in the year that funding was first received. Challenges to timely project implementation include inflation, which particularly affected FY 2021 and FY 2022 projects that relied on cost estimates that were developed prior to high levels of inflation that began in 2021.

- What is the typical lead time on those projects?

Response: Projects funded with LRF are at various stages of development when approved and have a range of complexity and delivery mechanisms. As mentioned above, delivery may happen with contracts, partner agreements, force account, or a combination. Some projects need planning and/or design before construction. The complexity of the project determines how long planning and design takes, as well as what contracting avenues can be exercised (e.g. small business, 8a, full and open, minority or women owned, etc.). All of these variables affect how long the process takes from appropriation to contract/agreement award and timelines vary accordingly.

Question 6: New Mexico Highlands University is researching ways to improve seedling survival in a post-fire environment and have found that locally grown seedlings have a higher success rate.

- What is the Forest Service doing to increase seed and seedling capacity in the Southwest?

Response: The Forest Service has developed a National Reforestation Strategy to provide a high-level framework for ramping up reforestation, including addressing nursery and seed needs. We are modernizing and expanding nursery greenhouse infrastructure within our nursery system and building partnerships with state, tribal, and private partners to increase seedling capacity. For example, in FY 2023 the Agency announced investments of \$4.5 million in twenty-nine facilities around the country to modernize forest nurseries. The Agency is also investing \$5.3 million to increase native seed collection and native plant availability to restore and support resilient ecosystems on national forests and grasslands. The Forest Service was a partner with other Federal agencies in the development of the National Seed Strategy for Rehabilitation and Restoration. The Forest Service is collaborating with federal and non-federal partners to implement the National Seed Strategy and increase the availability of native herbaceous and shrub species for use in revegetation projects. Funding is

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being used to collect, process, and grow native plants using networks of private and public nurseries, seed collectors, and storage facilities to supply native seed.

In support of the New Mexico Reforestation Center, the Forest Service has provided a \$10 million grant for the construction of a new nursery facility. Funds are available through non-competitive award through State Tribal and Private Forestry Disaster Relief Funding. In addition, a \$160,000 grant award through the Bipartisan Infrastructure Bill Ecosystem Restoration Provision 40804 (b)(9) to support the New Mexico Reforestation Center. The award was a part of a Forest Service strategy to support investments in state and tribal reforestation nurseries and seed orchards with a focus on improving efficiency and output of existing reforestation nurseries.

In New Mexico, the Forest Service's Southwest Region has an active partnership with New Mexico Highlands University to ensure sufficient seedling supply in the southwest.

Question 7: Will you work with partners like the New Mexico Reforestation Center to improve post-fire reforestation success rates?

Response: Yes. The Agency is happy to work with the New Mexico Reforestation Center alongside other partners to ensure sufficient seedling supply across the southwest to improve post-fire reforestation success rates.

Questions from Senator James E. Risch

Question 1: The bipartisan infrastructure law provided funding to the Forest Service to be used to facilitate collaborative groups working on forest restoration issues.

- a. Has this funding been disbursed to collaboratives in Region 1 and Region 4? If not, why?
- b. Please share a plan for when FY22, FY23, and FY24 facilitation dollars will be outlaid to Idaho's collaborative groups.

Response: (a) Regions 1 and 4 initially contributed \$80k to the National Forest Foundation to support Idaho collaboratives using Bipartisan Infrastructure Law (BIL) funds; Region 1 added an additional \$49,950 of BIL funds, and a modification to add \$55k of additional BIL funds to this agreement is underway for Region 4. Region 1 also funded an agreement with the Montana Forest Collaborative Network with \$165,000 of BIL funds. Region 4 is working to invest \$100,000 BIL funds in agreements with collaboratives.

(b): Once pending agreement modifications are executed, the amount of BIL funding provided to the National Forest Foundation for Idaho Collaboratives will total \$184,950. Additional funding is expected in FY 2024. The National Forest Foundation reported that they have distributed \$54,172 to eight separate Idaho Collaboratives as of mid-August 2023, and they are actively working to fund an additional collaborative's proposal.

Question 2: My office has been contacted by a grazing permittee on the Salmon-Challis National Forest who has suffered significant losses to his herd of cattle due to the Forest Service planting lupine. This species of lupine is toxic to cattle, and should not have been planted in the first place.

- a. Why does the USFS plant a variety of lupine that is toxic to livestock?
- b. Have you conducted an inventory of all species which are planted by the Forest Service?
- c. Have you identified other planted species which may be toxic to livestock?

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- d. Will the Forest Service consider working with the State Veterinarian for Idaho to identify a species of lupine that is non-toxic to domestic livestock?
- e. Will the Forest Service commit to never planting a toxic species of lupine?

Response: (a): Lupine has not been included in seed mixes on the Salmon-Challis National Forest for many years. Lupine does occur naturally in sagebrush and some forested habitat types on the forest and is considered an “increaser” species, meaning that it tends to increase in abundance following disturbance such as fire, overgrazing, or ground-disturbing activities. Some species, like velvet lupine, which is native to Idaho, appear to cycle with climatic patterns, increasing following wet years and dying back in drought.

(b): The Forest Service uses a variety of seed mixes for restoration work, and contents of those mixes are documented. The Forest Service is aware that a permittee asserts that the Forest seeded lupine around the timeframe of the 2003 Withington Fire, however, a review of available information does not indicate that any lupine was seeded. The Burned Area Emergency Rehabilitation (BAER) report provided by the Forest Hydrologist for the Withington Fire does not call for seeding within the fire area, except in the Seven Mile drainage, and only as it pertains to roads management and erosion potential. A review of timber management records indicate that some seeding did occur after the Withington Salvage project in 2005 to assist with erosion control, but per contract specifications, annual ryegrass was the only species seeded across an area of approximately 815 acres.

(c): The Forest Service has not identified other planted species which may be toxic to livestock.

(d): The Forest Service would gladly work with the Idaho State Veterinarian to identify a species of lupine that is non-toxic to domestic livestock.

(e): The Forest Service acknowledges the importance of grazing on the landscape and will consider and mitigate impacts to domestic cattle. Lupine is native to Idaho and grows naturally, particularly in disturbed areas. Lupine is used by wildlife, providing cover for small mammals and birds, and supports pollinators, including hummingbirds and a diversity of native bees. Lupine also fixes nitrogen and can be used to stabilize soils with low fertility. Rather than a wholesale ban on the use of lupine, the Forest Service prefers a more considered approach that may allow for planting in certain areas to meet desired conditions. There may be areas where inclusion of lupine in certain seed mixes could be appropriate, such as areas that are already closed to grazing.

Question 3: Has the Forest Service conducted any research on the health impacts of wildfire smoke for humans? If so, has the agency taken this research into consideration when implementing wildfire suppression and prevention strategies?

Response: The Forest Service does not directly conduct research on the general human subject health effects of wildfire smoke. Instead, we conduct modeling studies that explore the broader impacts of wildfire and prescribed fire smoke on human and ecological health. For example, [a 2022 study out of the Pacific Southwest Research Station](#) examined smoke emissions from various forest management regimes and found that “increased use of prescribed burning could reduce the [human] health impacts associated with large wildfires”. [Similarly, a 2022 study led by economic researchers at the Rocky Mountain Research Station](#) emphasized the

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need for new research to investigate the balance between the health benefits and costs associated with prescribed burning.

Additionally, we have conducted qualitative research to understand potential smoke exposure to our firefighters on wildfires and prescribed fires. This has supported our efforts to train fire personnel about public and personnel exposure to smoke as part of the National Wildfire Coordinating Group's Firefighter S-130 training and further training to support other fire positions. The Agency, through its leadership of the Interagency Wildland Fire Air Quality Response Program (IWFAQRP), does monitor, track and predict wildfire smoke levels including when smoke concentrations rise downwind of wildfires to levels which exceed the National Ambient Air Quality Standards set by EPA. The significant levels of smoke and duration of impacts from catastrophic wildfires are another reason for investing in addressing the wildfire crisis and reducing wildfire risk. The IWFAQRP has conducted research into these wildfire smoke impacts in order to support the goals of the Dingell Act of 2019 and provide the public with information about the effects of wildfire smoke on their health. The IWFAQRP has an interagency cadre of Air Resource Advisors (ARAs) and smoke specialists assigned to incident management teams responding to wildfire. These ARAs communicate forecasted smoke levels that could impact the public, and fire personnel address other needs identified by the incident management teams as needed.

Question 4: How often does the Forest Service reassess its wildland fire suppression and prevention strategies? Does the current wildfire suppression strategy take into consideration the Wildfire Crisis Strategy, current forest health, impacts to wildlife habitat, impacts to livestock, impacts to watersheds, cost to taxpayers, costs to local communities, and costs to human health?

Response: With continued changes in the fire environment to include hotter, drier, longer fire seasons, the Forest Service continually evaluates its fire management programs. Each wildland fire has a specific response strategy that takes into account forest health, wildlife habitat, impacts to livestock, impacts to watersheds, cost to taxpayers, cost to local communities, costs to human health and many other factors.

Question 5: How much standing sawtimber is located on lands designated as "priority landscapes" in the Forest Service's 10-year Wildfire Strategy?

Response: There is approximately 44 million cubic feet of standing sawtimber volume on National Forest System non-reserved land within the Wildfire Crisis Strategy (WCS) 21 priority landscapes, and 7 million cubic feet of standing sawtimber volume on National Forest System reserved land within the WCS 21 priority landscapes, based on Forest Service Forest Inventory and Analysis (FIA) plot data. Note: these estimates only include volume on Forest Service lands within the WCS landscapes, and volume on reserved areas is not available for timber production.

Information is presented by the WCS priority landscapes below. Estimates for individual landscapes are presented by non-reserved and reserved status because reserved land is permanently prohibited from being managed for the production of wood products through statute or Agency mandate; the prohibition cannot be changed through decision of the land manager. Harvest may occur to meet protected area objectives. An example of reserved is designated Federal wilderness areas. In this case, we are using the terms "non-reserved" and "not reserved" interchangeably. These terms are meant to indicate all lands that do not have the reserved designation.

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Wildfire Crisis Strategy Landscape	Reserved status	Sawtimber volume (million cubic feet) on FS land	Percent error	# of FIA plots
4FRI	Not reserved	3,157	6%	404
	Reserved	109	37%	15
Central Oregon	Not reserved	2,779	4%	661
	Reserved	348	20%	58
Central Washington Initiative	Not reserved	3,730	4%	586
	Reserved	NA	NA	0
Colorado Front Range	Not reserved	1,067	8%	180
	Reserved	270	23%	32
Colville Northeast Washington Vision	Not reserved	3,640	3%	692
	Reserved	32	55%	7
Enchanted Circle	Not reserved	654	13%	69
	Reserved	105	50%	4
Klamath River Basin	Not reserved	11,091	4%	931
	Reserved	2,819	10%	150
Kootenai Complex	Not reserved	1,592	8%	107
	Reserved	44	50%	6
Mount Hood Forest Health and Fire-Resilient Communities	Not reserved	2,525	8%	174
	Reserved	1,809	12%	78
Nez Perce-Clearwater-Lower Salmon	Not reserved	4,257	7%	202
	Reserved	599	19%	51
North Yuba	Not reserved	1,696	13%	43
	Reserved	NA	NA	0
Pine Valley	Not reserved	NA	NA	1
	Reserved	NA	NA	0
Plumas Community Protection	Not reserved	620	21%	23
	Reserved	NA	NA	0
Prescott	Not reserved	78	42%	12
	Reserved	NA	NA	0
San Carlos Apache Tribal Forest Protection	Not reserved	76	52%	12
	Reserved	NA	NA	0
Sierra and Elko Fronts	Not reserved	845	22%	49
	Reserved	31	56%	6
Southern California Fireshed Risk Reduction Strategy	Not reserved	262	25%	42
	Reserved	704	29%	40
Southwest Idaho	Not reserved	1,843	9%	125
	Reserved	NA	NA	0

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Wildfire Crisis Strategy Landscape	Reserved status	Sawtimber volume (million cubic feet) on FS land	Percent error	# of FIA plots
Stanislaus	Not reserved	641	20%	29
	Reserved	NA	NA	0
Trinity Forest Health and Fire-Resilient Rural Communities	Not reserved	2,806	10%	91
	Reserved	157	43%	6
Wasatch	Not reserved	546	14%	63
	Reserved	45	65%	5

¹ The Pine Valley landscape did not contain enough forested FIA plots to calculate an accurate estimate. NA = Not applicable

Question 6: How much standing sawtimber is located on lands designated as “insect and disease treatment areas” under the Healthy Forests Restoration Act?

Response: There is approximately 109 million cubic feet standing sawtimber within Healthy Forest Restoration Act areas on non-reserved (National Forest System lands without any additional designation) lands and approximately 4 million cubic feet on reserved lands (National Forest System lands with an additional designation, such as Wilderness), based on Forest Service Forest Inventory and Analysis (FIA) plot data. Volume on reserved areas is not available for timber production. Note that these estimates are for areas within the Healthy Forest Restoration Act [feature class](#) and not treatment areas.

Estimates in the table are by National Forest System Region. Estimates for each Region are presented by non-reserved and reserved status because reserved land is permanently prohibited from being managed for the production of wood products through statute or Agency mandate; the prohibition cannot be changed through decision of the land manager. Harvest may occur to meet protected area objectives. An example of reserved is designated Federal wilderness areas. In this case, we are using the terms “non-reserved” and “not reserved” interchangeably. These terms are meant to indicate all lands that do not have the reserved designation.

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NFS Region	Reserved status ¹	Sawtimber volume (million cubic feet)	Percent error	# of FIA plots
Region 1	Not reserved	17,101	3%	1,153
	Reserved	134	56%	8
Region 2	Not reserved	10,791	3%	1,629
	Reserved	64	42%	9
Region 3	Not reserved	7,296	3%	1,035
	Reserved	104	42%	7
Region 4	Not reserved	6,642	4%	730
	Reserved	180	33%	17
Region 5	Not reserved	22,460	3%	997
	Reserved	1,373	19%	55
Region 6	Not reserved	17,728	2%	3,698
	Reserved	1,611	10%	210
Region 8	Not reserved	19,784	1%	3,030
	Reserved	157	31%	28
Region 9	Not reserved	7,616	2%	2,458
	Reserved	290	13%	86

Question 7: Can you share the total Allowable Sale Quantity (ASQ) and Permissible Timber Sale Quantity (PTSQ) in current forest plans, including plans modified by litigation, critical habitat designation, or other types of modifications?

Response: We do not corporately track Allowable Sale Quantity (ASQ) or Permissible Timber Sale Quantity (PTSQ) from Land Management Plans as modified by litigation, critical habitat designation, or other types of modifications. These are not considered land allocations or designations. Rather, they provide a ceiling of how much volume may be cut from a particular unit according to each Land Management Plan. To ensure clarity and understanding, we would like to share the respective definitions for ASQ and PTSQ and provide a brief explanation of what they represent and when each is used:

Allowable Sale Quantity (ASQ) is the maximum amount of volume potentially available as part of regularly scheduled timber harvest from lands suitable for timber production. It is an annual average based on the forest plan initial 10-year estimate. It is not based on the planning unit's fiscal capability and organizational capacity.

Projected timber sale quantity (PTSQ) is the estimated quantity of timber meeting applicable utilization standards that is expected to be sold (suitable and not suitable lands). It is an annual average based on the forest plan initial 10-year estimate. The PTSQ is based on the planning unit's fiscal capability and organizational capacity.

¹ Not reserved indicates National Forest System lands that do not have any additional designation. Reserve lands have an additional designation, such as Wilderness.

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ASQ was used in Land Management Plans that pre-date the 2012 Forest Planning Rule. Plans after that date provide PTSQ. Some plans provide both numbers.

ASQ and PTSQ are identified within the Land Management Plans for each administrative unit of the National Forest System. We recently compiled a one-time review of existing ASQ/PTSQ data from existing Land Management Plans, but the data is highly complex and variable and would be more suitable to provide in a committee staff briefing, which we would be pleased to arrange upon request.

Question 8: Congress established several emergency authorities for fire mitigation in November 2021. To date, the Forest Service has not proposed a single project in Idaho utilizing these authorities. Meanwhile, catastrophic wildfires continue to rage throughout the West.

- a. Can you explain why you haven't used every tool available to curb fire in my home state?
- b. What is the Forest Service's plan to apply these emergency authorities in Idaho?

Response: (a): The Forest Service has made extensive efforts to curb fire in Idaho. In 2022, the Agency allocated \$17.4 million for the Southwest Idaho landscape, with total funding slated for \$59.5 million between 2022 and 2024. In 2023, the Agency added the Nez-Perce-Clearwater-Lower Salmon landscape alongside an expected funding announcement for \$34 million. Additionally, the Agency is using several emergency authorities, including BIL, and NEPA authorities to accelerate planning, consultation, contracting, hiring and implementation of fuels and forest health treatments in Idaho and across 250 high-risk fireheds across the country.

(b): The Forest Service is working expeditiously to utilize our emergency authorities in Idaho. For example, on the Nez-Pierce-Clearwater National Forest we have two projects making use of the Western Fireshed Emergency Action Authority to cover over 20,000 acres of treatment work. In addition, the Chief provided additional guidance to Forest Service senior leadership on the use of this authority in a memo dated July 19, 2023.

Question 9: Can you provide the amount of money spent on trail clearing in each national forest in Idaho for FY19-23?

Response: The funding for the Forest Service's National Trails Program is appropriated for comprehensive trail maintenance activities, which may include trail clearing, grubbing, trail tread maintenance, trail bridge replacement, management of National Scenic and National Historic Trails, Forest Service stock program management, and other trail-related activities. Trail clearing is often conducted under a broad contract funded from multiple sources and with multiple outcomes.

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Idaho National Forest Trails Program Allocations (Fiscal Years 2019–2023)

	FY 19	FY 20	FY 21	FY 22	FY 23
Boise	\$306,580	\$293,579	\$75,180	\$72,296	\$93,774
Caribou-Targhee	\$504,528	\$469,906	\$176,500	\$104,939	\$203,614
Payette	\$289,412	\$277,468	\$68,967	\$66,322	\$86,025
Salmon-Challis	\$638,637	\$749,521	\$178,149	\$97,390	\$244,322
Sawtooth	\$466,002	\$405,909	\$82,787	\$79,390	\$109,263
Nez Perce–Clearwater	\$1,225,000	\$1,411,000	\$214,200	\$279,400	\$286,000
Idaho Panhandle	\$979,000	\$840,000	\$121,900	\$114,865	\$102,000

The funding amounts above do not fully reflect the amount of funding that contributed to trail clearing activities in those fiscal years. In addition to the National Trails Program allocations above, trail clearing is also supported by:

- National Forest System salaries and expenses that fund all Forest Service trail crews and specialists, but are not allocated by activity.
- Great American Outdoor Act funds for Idaho National Forests in the Northern Region, including the Central Idaho Complex deferred maintenance funding of \$5 million over 5 years.
- Bipartisan Infrastructure Law and Legacy Roads and Trails Remediation Program funds for projects that include trail clearing.
- In-kind trail partner contributions.
- Trail clearing conducted by Youth programs such as the Youth Conservation Corps or the Idaho Youth Challenge Academy.
- Donations from the Idaho State Trail Ranger Program.
- Recreational Trails Program grants from the Idaho Department of Parks and Recreation.
- Trail clearing performed as land use fee offset work by outfitters and guides under the National Forest System Trails Stewardship Act.

In fiscal year 2021, the Forest Service budget structure changed the appropriations for salary and expense budget line items. Before fiscal year 2021, Agency employees were funded from program budget line items. The substantial change in National Trails Program allocations from fiscal year 2020 to 2021 reflects this change in the Agency's budget structure.

Questions from Senator John W. Hickenlooper

Question 1: Colorado has seen devastating wildfires in recent years, including the East Troublesome and Cameron Peak fires of 2020, which burned roughly 400,000 acres in Colorado. Massive fires like these have direct effects on our watersheds, which can lead to impacts for ecosystems and drinking water sources.

How does your budget support post-wildfire recovery efforts, particularly for long-term steps to restore our watersheds?

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Response: The Forest Service must work at the scale needed to restore landscapes from climate change driven disasters with fires impacting more lands and the cascading disasters caused by storm events leading to more post-fire flooding and debris flows. The 2021 fire season alone is estimated to have resulted in over \$1 billion in post-fire restoration needs for invasive plants treatments, range and recreation infrastructure repair, watershed restoration, wildlife and fisheries habitat recovery, and revegetation.

The FY 2024 President's budget requests \$50.5 million for the Vegetation and Watershed Management budget line item to support healthy and resilient watersheds and landscapes, sustain the production of clean and abundant air and water, assist with meeting the Administration's climate change goals, and contribute to healthy and productive communities and tribal nations. Additionally, the 2024 budget request calls for \$56 million to establish a permanent Burned Area Rehabilitation program to build on the \$65 million per year seed money from the Bipartisan Infrastructure Law to rehabilitate burned areas.

Questions from Senator Steve Daines

Question 1: Chief Moore, last year, the Forest Service sold approximately 2.9 billion board feet of timber. This is a significant decrease from the 3.2 billion board feet sold in Fiscal Year 2020. The Forest Service has stated that one of the challenges to the Timber Sale Program is dealing with "low value material." Unfortunately, permanently losing sawmills creates even more "low value material" or as it should more properly be called "high cost material" as the distance to transport the logs to remaining sawmills becomes cost prohibitive. How does the Forest Service plan to increase timber harvest numbers this Fiscal Year? Can the new streamlined Emergency Authorities be used in National Forests that have low timber sale projections (like the Kootenai NF) due in large part to ongoing litigation?

Response: Investments made through the IIA and IRA are positioning the Agency to work at a much larger scale through existing tools while also investing in new innovative approaches. As an example, the Agency has been able to expand use of the Good Neighbor Authority through the BIL while also establishing national level "keystone" agreements with partners such as the National Wild Turkey Federation. Capacity remains a significant challenge, but the Agency is making investments to hire and train employees needed to execute this important work and leveraging the knowledge and capacity of a wide range of partners.

The Forest Service is using several emergency authorities, including BIL NEPA authorities, to accelerate planning, consultation, contracting, hiring and implementation of fuels and forest health treatments across the 250 high-risk fire sheds. The Agency is assessing and identifying potential actions available under current authorities, and is open to providing technical assistance to Congress on additional options for expediting this work.

Question 2: Chief Moore, you testified that you have approved six out of eight requests from Regions to use the new Emergency Authority invoke by Secretary Vilsack across 250 high risk fire sheds. Can you please provide information on these six requests including their location and acreage? Additionally, can you provide information on the two that were not approved and why? With 250 high risk landscapes being designated, what additional work will be done to educate Regions on this new authority and how to request its use?

Response: To date, 39 EADs under 40807 authorities have been reviewed and approved; the estimated acres covered by the EADs is 1.02 million acres. There are an additional 14 EADs that are pending approval. In some

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cases, proposal were returned to the Region because a substantial portion of the proposed treatment area was outside the high risk firesheds or proposals were voluntarily withdrawn by the Region as they discovered they could complete the Categorical Exclusion under NEPA without a need to use the emergency authority. Below is a list of the proposals approved to use the Western Fireshed Emergency Action Authority.

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Region	Forest	District(s)	Project Name	Acres Proposed for Treatment
1	Beaverhead-Deerlodge	Pintler	Georgetown Fuel Break	2,160
1	Beaverhead-Deerlodge	Butte	Basin Cataract Buttermilk Fuel Break	1,426
1	Bitterroot	Darby, Sula	Bitterroot Front	138,240
1	Bitterroot	Darby	Sleeping Child Fuel Break	2,130
1	Bitterroot	West Fork	Soda Baker Fuelbreak	2,500
1	Bitterroot	Darby	Rye Creek Fuels Break	1,886
1	Bitterroot	Sula	Sula District Fuel Break	3,000
1	Flathead	Hungry Horse, Tally Lake	Flathead Fuel Breaks	2,800
1	Helena-Lewis and Clark	Lincoln	Dalton Stemple Fuel Break	3,000
1	Helena-Lewis and Clark	Helena	City of Helena Municipal Water Supply Infrastructure	N/A
1	Idaho Panhandle	Bonner's Ferry	Katkee Fuels	7,500
1	Kootenai	Libby	Norman-McCedar Project	3,410
1	Kootenai	Libby	Snowshoe Granite 1000	1,430
1	Kootenai	Fortine	Edna Fortine Fuels Reduction	2,996
1	Kootenai	Fortine	Sunday Vegetation Management Project	2,372
1	Kootenai	Three Rivers	Trojan Defense Hazardous Fuels Reduction	1,723
1	Lolo	Superior	Superior North	14,502
1	Lolo	Seeley Lake	Highway 83N Seeley Wildland Urban Interface (WUI) Good Neighbor Authority (GNA)	9,233
1	Lolo	Ninemile	Westside Ninemile Wildfire Resiliency Project	3,000
1	Nez Perce-Clearwater	Red River	Dixie Comstock	5,600
1	Nez Perce-Clearwater	Red River	Twentymile	9,100
1	Nez Perce-Clearwater	Red River	Deadwood Linear Fuels	2,500
1	Nez Perce-Clearwater	Red River	Big Burn	2,800

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1	Nez Perce-Clearwater	Red River	Sing Lee Linear Fuel Break	600
1	Nez Perce-Clearwater	Red River	Limber Elk	2,657
2	Black Hills	Northern Hills	Chimera Fuels Reduction Project	39,217
2	Black Hills	Northern Hills	Zeppelin Forest Health	10,000
2	Pike and San Isabel	South Platte	Lower North-South Vegetation Management Project	116,000
2	Shoshone	Wind River	Green Union	10,100
3	Apache-Sitgreaves	Springerville	Round Valley Firescape	29,000
3	Carson	Camino Real	Hermit Peaks Calf Canyon and Luna Post-fire Recovery	31,160
3	Gila	Silver City	Silver City West Hazardous Fuels	10,450
4	Boise	Idaho City	Upper Moers Project	26,278
5	Plumas		Central and West Slope Community Protection	217,271
5	Shasta-Trinity	Mt. Shasta	South Fork Sacramento Public Safety and Forest Restoration Project	12,220
5	Stanislaus		Social and Ecological Resilience Across the Landscape (SERAL) 2.0	119,000
6	Okanogan-Wenatchee	Wenatchee River	Chumstick to LP Restoration Project	36,500-53,000
1	Lolo	Missoula	Wilkes Cherry	20,261
2	Pike and San Isabel	Pike's Peak	East Park-North Divide Fuels Reduction Project	18,640

Question 3: Chief Moore, the 2018 Omnibus Appropriations bill included language directing the Forest Service to develop streamlined regulations to facilitate improved permitting for vegetation management of utility rights-of-way. I'm pleased that those regulations have been issued and are starting to work. However, I have heard that the process of removing this dangerous fuel has been hindered by uncertainty about how to classify the dangerous trees and fuels removed during vegetation management. The classification is critical to the time and cost of removing this debris. Should these materials be classified as "wood waste" for valuation?

Response: Because of the wide variation in size and volume of vegetation cut within or along powerline rights-of-way, a general classification of the material as waste is not legally or programmatically appropriate. The agency has worked closely with powerline owners and operators on the issue of vegetation removal and has found that valuation of powerline vegetation debris is less of a concern for companies than the challenges associated with removal and relocation of the vegetation. The Forest Service has recently clarified the clause in powerline facility authorizations governing disposal of felled trees. Consistent with applicable law, the clarified clause provides for the Agency to determine in advance of felling the method of disposal of trees that meet utilization standards. Disposal of these trees may be by sale or without charge per Agency regulations, as may

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be most advantageous to the United States. Debris from felling that does not meet utilization standards is to be disposed of according to methods determined by the Forest Service. In addition, the Agency's directives implementing statutory and regulatory requirements for powerline facility operating plans and agreements provide for the owner or operator to propose methods for disposal of vegetation, including debris.

Question 4: Chief Moore, the Forest Service recently submitted an invoice for \$5.2 million to Vigilante Electric Cooperative of Dillon, MT, for the entire cost of fighting the 2021 Deep Creek Canyon Fire. The fire was caused by a tree on Forest Service property outside the co-op right-of-way that fell on a power line serviced by Vigilante. This invoice is a significant financial impact on a small rural co-op, ignores Forest Service responsibility and provides the co-op no opportunity for rebuttal or negotiation. It is my understanding that this is a result of liability terms in the Forest Service Electric Transmission Line Master Agreement and associated permit. I'd appreciate a commitment from the agency to work with me and Montana's co-ops on an equitable solution to the Deep Creek Canyon Fire invoice and the terms of the Master Agreement.

Response: Under applicable federal law and their special use authorizations, powerline facility owners and operators are responsible for inspection, identification, and mitigation of hazard trees, both inside and outside their right-of-way on National Forest System lands. Statutory and regulatory authorities and special use authorizations provide for powerline facility owners and operators to be responsible for damages they cause to the United States and to indemnify the United States for damages they cause the United States. In addition, federal agencies are required to attempt to collect debts they incur. In some circumstances, it may be appropriate legally and factually to settle a debt or provide for a payment plan. The Forest Service would be happy to discuss this matter with you. Please contact Jacob Donnay at jacob.donnay@usda.gov to request a briefing.

Question 5: Chief Moore, current forest plans call for approximately 6 billion board feet of timber harvest annually. Overstocked forests increase the risk of catastrophic wildfires, and commercial stakeholders are important partners in getting needed management work done. What has the Forest Service done to encourage proactive engagement with sawmills and forest contractors near National Forest System lands to ensure that timber sales are economically feasible?

Response: The highest priority for the Agency is addressing the wildfire crisis, that includes treatment of 20 million acres of National Forest System land and 30 million acres on State, Tribal, and private lands. In addition to addressing the wildfire crisis, improving the resilience of forests and communities in the face of climate change is also a high priority.

Over the past five years, the Agency has sold an average of 3.09 BBF annually, higher than any period in the previous few decades. This increase occurred as a result of efficiencies; however, historic wildfires of 2020 and 2021 had a major impact on Agency capacity to meet targets as staff and other resources had to be devoted to post fire recovery. Investments made through the IJA and IRA are positioning the Agency to work at a much larger scale through existing tools while also investing in new innovative approaches. As an example, the Agency has been able to expand use of the Good Neighbor Authority through the BIL while also establishing national level "keystone" agreements with partners such as the National Wild Turkey Federation. Capacity remains a significant challenge, but the Agency is making investments to hire and train employees needed to execute this important work and leveraging the knowledge and capacity of a wide range of partners.

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The Agency and partners recognize the scale of work needed to maintain healthy and resilient forests. The Agency works closely with industry partners at the Forest, Regional and National scale in order to meet mission delivery and maintain and grow a robust industry infrastructure needed for forest management. The Agency uses a variety of approaches to increase management and stabilize infrastructure. As an example, the Agency has developed a timber transport pilot aimed specifically at moving excess wood products by rail across the West. This, along with innovative approaches such as execution of larger scale contracts and national agreements, aim to ensure a robust forest industry is maintained and growing to support the removal and utilization of forest products.

Local national forest units also work to ensure timber sales are economically viable by providing advanced notification of upcoming timber sales in the forests' six and twelve month periodic sale announcements, including estimated volumes by products and sale locations. National Forests that utilize Integrated Resource Contracts provide opportunities for a field review with perspective bidders through "show me trips", to ensure engagement on site and identify any key or critical issues, and units with current active sales engage regularly with purchasers in sale administration, communicating about issues related to sale viability, markets, and any unforeseen circumstances that should be considered in upcoming sale advertisements.

Question 6: Chief Moore, how much standing sawtimber exists on acres of National Forest System lands that are designated as Insect and Disease Treatment Areas? How much exists in the priority fireheds designated by the Forest Service in the 10-year Wildfire Strategy?

Response: Estimates of sawtimber volume were generated using Forest Inventory and Analysis plots located within HFRA areas designated on a spatial layer from the Forest Service Enterprise Data Warehouse. The insect and disease areas were identified align with sections 602 and 603 of the Healthy Forests Restoration Act (HFRA)

Sawtimber volume on non-reserved National Forest System lands (lands without an additional designation such as Wilderness) within areas designated under sections 602 and 603 of the HFRA (million) estimate: 108,335 cubic feet (1,300,072 board feet).

The Forest Service has estimates of sawtimber volume on non-reserved National Forest System land within the 21 Wildfire Crisis Strategy landscapes, based on Forest Service Forest Inventory and Analysis (FIA) plot data. Note that not all land within the Wildfire Crisis Strategy landscapes is under National Forest System administration.

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Wildfire Crisis Strategy Landscape	Sawtimber volume (mil. cubic ft)	% error
4FRI	3,157	6%
Central Oregon	2,779	4%
Central Washington Initiative	3,730	4%
Colorado Front Range	1,067	8%
Colville Northeast Washington Vision	3,640	3%
Enchanted Circle	654	13%
Klamath River Basin	11,091	4%
Kootenai Complex	1,592	8%
Mount Hood Forest Health and Fire-Resilient Communities	2,525	8%
Nez Perce-Clearwater-Lower Salmon	4,257	7%
North Yuba	1,696	13%
Pine Valley*	NA	NA
Plumas Community Protection	620	21%
Prescott	78	42%
San Carlos Apache Tribal Forest Protection	76	52%
Sierra and Elko Fronts	845	22%
Southern California Fireshed Risk Reduction Strategy	262	25%
Southwest Idaho	1,843	9%
Stanislaus	641	20%
Trinity Forest Health and Fire-Resilient Rural Communities	2,806	10%
Wasatch	546	14%

* The Pine Valley landscape did not contain enough forested FIA plots to calculate an accurate estimate.

Question 7: Chief Moore, wildland firefighter housing needs continues to be a major issue for employee retention as the private housing market remains high and government owned properties face a maintenance backlog. The Great American Outdoors Act included funding that could be used to maintain housing assets by addressing structural, mechanical, and health safety issues. What maintenance projects did the Forest Service complete in FY22 and what projects are planned or ongoing in FY23?

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Response: In FY 2021 GAOA-LRF funded seven projects with a component of deferred maintenance work on a housing asset located within an administrative site available for supporting fire personnel. One of the seven projects is completed. Total funding approved for these projects to date is \$4,392,271.

Table 1. FY21 GAOA Funded Projects with a housing component included.

STATUS	NAME	PROJECT SUMMARY
PROJECT FINALIZED	HELL CANYON LOG CABIN AND TEPEE HOUSE EXTERIOR RESTORATION	This project will restore a Civilian Conservation Corps-era log cabin and ranger dwelling at the Hell Canyon Work Center. Activities include chemical stripping, staining, log repair and replacement, caulking and chinking and log repair.
READY	MOOSE CREEK WILDERNESS WORK CENTER DEFERRED MAINTENANCE	The Moose Creek Ranger Station in the Selway Bitterroot Wilderness embodies the rich heritage of the forest and the wilderness area. This project will reduce deferred maintenance items at the Ranger Station and several of its outbuildings. Project work includes painting, chinking, roofing, and water/wastewater system repair.
DESIGN	GOOSEBERRY GUARD STATION RENOVATION	The Gooseberry Guard Station located in San Juan County, Utah has long served as an important administrative site to house seasonal staff and volunteers working in the area. With the designation of the Bears Ears National Monument, the site has become a vital component in managing the sensitive natural and cultural resources in the area. This project addresses the existing deferred maintenance as well as complete a workshop and replace the aging solar power system on the cabins.
WORK IN PROG	COMANCHE CARRIZO WORK CENTER SEPTIC SYSTEM AND REHABILITATION	The septic system at the Comanche Carrizo Work Center on the Pike and San Isabel National Forests needs an overhaul. Project work includes replacement of the septic tanks at the house and shop.
WORK IN PROG	MANILA HOUSE CONVERSION TO SEASONAL RECREATION HOUSING	Currently there is no housing for a seasonal workforce in Manila on the Flaming Gorge Ranger District. This project will address outstanding maintenance needs at the Manila Office that will make the facility suitable for seasonal housing. Providing seasonal housing in Manila allows for increased efficiency and productivity as well as improved retention of high-quality seasonal personnel.

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WORK IN PROG	SAWTOOTH NATIONAL RECREATION AREA ROOFING DEFERRED MAINTENANCE PROJECT	The project is roof replacement on building within the Sawtooth National Recreation Area. Work includes removal of existing wood shingles, installation of plywood sheathing, underlayment, drip edge, and new shingles.
WORK IN PROG	SHADOW MOUNTAIN VILLAGE REHABILITATION	This multi-year project includes the assessment, design, and reconstruction of the Shadow Mountain Village buildings and transportation facilities on the Arapaho-Roosevelt National Forests. Project work consists of refurbishing historic houses and facilities as well as reconditioning and repair to the surrounding roads.

In FY 2022 GAOA-LRF funded two projects with a component of deferred maintenance work on a housing asset located within an administrative site available for supporting fire personnel. Both projects are still in the design phase. Total funding approved for these projects to date is \$497,500.

Table 2. FY22 GAOA Funded Projects with a housing component included.

STATUS	NAME	PROJECT SUMMARY
DESIGN	BRUSH CREEK VISITOR CENTER REHABILITATION	Replacement of the existing potable water distribution system, which serves trailer pads and buildings including the visitor center and residing the visitor center with metal siding.
DESIGN	FOREST-WIDE HISTORICAL PRESERVATION AND REHABILITATION OF THE FOREST RECREATION RENTAL PROGRAM	This multi-year project includes planning, business plans, and substantial repairs for six facilities to be placed in the Federal Lands Recreation Enhancement Act program. Work includes infrastructure and power repairs or improvements to bring assets to standard.

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In FY 2023 GAOA-LRF funded two projects with a component of deferred maintenance work on a housing asset located within an administrative site available for supporting fire personnel. Both projects are still being implemented. Total funding approved for these projects to date is \$367,700.

Table 3. FY23 GAOA Funded Projects with a housing component included.

STATUS	NAME	PROJECT SUMMARY
CONTRACT AWARDED	BIG SMOKEY GUARD STATION ROOF REPLACEMENTS	The project will replace roofs on various buildings in the Big Smokey Work Center. The work center provides housing within the forest for seasonal employees as well as a station for our fire employees.
DESIGN	UINTA GUARD STATION REHABILITATION	This project includes replacing the roof, interior improvements, painting the exterior, adding a concrete restroom, new appliances, and multiple other tasks. The rehabilitation of this historic structure is being done before it is added to the recreation rental program.

The FY2024 Forest Service Congressional Budget Justification included a placeholder line for \$24.5 million in deferred maintenance housing projects. As the FY2024 proposed project list has been revised through the recast process to reflect updated funding needs and project clarifications, funding for housing has increased to over \$40 million proposed in FY2024 across 28 administrative units focused largely on the western United States.

Question 8: Chief Moore, what actions has the Forest Service taken to address wildland firefighter housing needs?

Response: In November 2023, the Forest Service established a governance framework to support oversight in managing the national housing portfolio. The governance framework includes a Housing Leadership Board (HLB), which provides oversight of development and implementation of the national housing strategy and establishment an Integrated Project Team (IPT) dedicated to identifying creative solutions while maximizing use of existing authorities. As part of the national housing strategy, administrative units will conduct quarters needs assessments to determine the status of the Agency's housing inventory and any anticipated changes required to meet permanent and seasonal staffing needs. Internally, the priority for the Agency is to address deferred maintenance on existing Forest Service housing facilities. Issues with code compliance and current uses of non-housing facilities impede their conversion into housing units. Externally, the Agency is exploring opportunities to collaborate with other parties to provide workforce housing using the leasing authority in Section 8623 of the 2018 Farm Bill.

The President's fiscal year 2024 budget includes \$50 million to address housing maintenance challenges that are adversely affecting recruitment, retention, and support of the Agency's workforce. Many Forest Service duty stations are located in areas with historically high rent and home ownership costs, which makes it difficult for the Forest Service to recruit, hire, and retain employees.

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Question 9: Chief Moore, I recently sent a letter with six other bipartisan senators to OMB regarding their pricing guidelines for Federal housing. What actions has the Forest Service taken to work with OMB to ensure that wildland firefighters have access to safe and affordable housing?

Response: The Forest Service is reviewing OMB Circular A-45R and will be making recommendations to the chair of the National Housing Council (NHC) and the Office of Management and Budget (OMB) regarding changes to pricing guidelines, adjustments to rental rates, and rent class determinations.

Question 10: Chief Moore, Gardiner, Montana, is suffering from a shortage in affordable housing. This is in large part due to the constraints of building new housing as Gardiner, like many gateway communities, is fully surrounded by public lands. What actions has the Forest Service taken to work with the local community, the National Park Service, and others to find solutions to the housing crisis in gateway communities?

Response: The shortage of affordable housing directly affects the Forest Service's ability to recruit, hire, and retain an adequate workforce in high-cost areas. Other federal land management agencies like the National Park Service share this challenge but are subject to separate authorities. The Forest Service greatly appreciates the authority Congress provided the agency in Section 8623 of the 2018 Farm Bill, which allows the Forest Service to lease administrative sites (e.g., agency headquarters, ranger station, research station) for housing purposes. This authority has the potential to create new opportunities for public-private and federal-local governmental partnerships that can provide affordable housing for local communities and the Agency's workforce. The Forest Service has several projects utilizing this novel authority in various stages of planning and development. A lease has been issued for the Dillion Work Center, and planning is at an advanced stage for the El Jebel Administrative Site. Both of these projects are located in Colorado. We would glad to work with you and the Gardiner community to explore potential solutions to the affordable housing problem.

Question 11: Chief Moore, the Forest Service uses a tool called eSafety that tracks Safety and Occupational Health incidents, accidents, and Worker's Compensation case management. The Forest Service website states that the eSafety tool "validates employee information and streamlines the process of filing injury claims with DOL's ECOMP system." How does the eSafety system streamline the process of filing injury claims with DOL's ECOMP system? What is the average length of time that it takes an injury claim to be processed and approved using the eSafety system?

Response: The Forest Service eSafety tool eliminates the transmission of inaccurate employee information as it contains a data feed directly from the National Finance Center—the official record for personnel data—with fields such as legal name, organizational code, occupational series, grade, pay, Federal Employee Health Benefits status and Federal Employee Group Life Insurance, to name a few. Receipt of the data by the Department of Labor (DOL) Office of Worker's Compensation (OWCP) is one of the conditions for coverage, as prescribed by law. The direct feed to eSafety eliminates "return to sender" instances from DOL due to receipt of inaccurate information and minimizes associated determinations of untimely filing to DOL OWCP. From the date reported and filed as a claim in eSafety, it takes on average less than 24 business hours to have a claim submitted to DOL OWCP via ECOMP. Review of case documentation and adjudication of claims is solely handled by DOL OWCP for rendering of decisions to accept or deny a claim; Forest Service case managers provide advice and counsel to employees and supervisors around claims requirements and documentation to improve accuracy and completeness of claims submitted to DOL OWCP. Typical DOL OWCP response times vary depending on the case. Simple and emergency medical care cases are generally

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approved within 24 hours. For other cases, DOL OWCP generally take 120 – 160 days to accept or deny an employee's claim. If compensation is part of the claim, payments start after a claim is accepted by DOL OWCP.

Question 12: Chief Moore, the Forest Service continues to face a road maintenance backlog. Loss of road access threatens resource management, limits access for firefighters and other first responders, and reduces recreational access. What road maintenance projects did the Forest Service complete in FY22 and what projects are planned or ongoing in FY23?

Response: The Forest Service performed maintenance on 32,660 miles of roads in FY22, and 25,021 miles of road maintenance is recorded in our database for FY23. The Forest Service road inventory consists of 65,000 miles of passenger car accessible roads and 200,000 mile of high clearance roads. This 265,000 miles of roads are accessible to the public and used for access to support forest management treatments, fire control, recreation, and emergency response. The majority, approximately 2/3, of our maintenance activities are performed on the 65,000 miles of passenger car accessible roads.

Question 13: Chief Moore, in FY22, the Forest Service used Division D, Title VIII, Section 40804(b)(2) of the Bipartisan Infrastructure Law to fund eight Good Neighbor Agreements and two agreements under Section 2(b) of the Tribal Forest Protection Act of 2004. The funding lasts for four more years and the allocations have already been made for FY23 projects. Outside of this funding, how is the Forest Service working with states, tribes, and counties to encourage increased use of the Good Neighbor Authority?

Response: The Forest Service is working with tribes, states, and counties at the local, regional and national level to increase use of Good Neighbor Authority (GNA). National Forest and Grassland units work directly with tribes, states, and counties to identify priority projects and design and implement them in a collaborative manner using the appropriate GNA agreement. At regional levels, regional leadership and staff work with state agencies to develop new and/or add to existing GNA agreements to carry out larger-scale restoration work that supports state-level management plans and/or regional and national priorities like the Forest Service's Wildfire Crisis Strategy. At the national and regional level, the Forest Service engages with multiple tribal, state, and county organizations to improve understanding and use of the authority. Organizations include, but are not limited to, National Association of State Foresters, National Association of Counties, Western Association of Fish and Wildlife Agencies, Inter Tribal Timber Council, Council of Western State Foresters, and Association of Fish and Wildlife Agencies.

As of September 30, 2023, we have five hundred seven (507) GNA agreements, which includes 414 agreements with states, 30 agreements with Tribes, 39 agreements with counties and 24 agreements with state, Tribal or county organizations, to perform a variety of restoration services.

Questions from Senator John Hoeven

Question 1: The State of North Dakota has been working with the grazing associations, the Bureau of Land Management, and the U.S. Forest Service to convert orphaned oil wells to freshwater wells. Remediation helps address environmental hazards resulting from legacy orphaned oil wells, while utilizing existing infrastructure to provide freshwater to benefit livestock, wildlife, and fire suppression efforts.

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This effort has stalled because the Forest Service has raised concerns surrounding the responsible party for converted wells. Under state law, however, the operator or the State of North Dakota would be the responsible party for the reclamation work, and the grazing association would assume future liability for the operation of the freshwater well.

Will you commit to working with the State of North Dakota on a solution to advance the conversion of orphaned oil wells to freshwater wells?

Response: The Forest Service is committed to working with the State of North Dakota on a solution to advance the conversion of orphaned oil wells to freshwater wells.

ORGANIZATION	PAY PLAN	OCC SERIES	POSITION TITLE	DUTY CITY STATE
1-STATE AND PRIVATE FORESTRY	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
2-ROCKY MOUNTAIN REGION, REGION 2	ES	0340	REGIONAL FORESTER	LAKEWOOD, CO
3-OFFICE OF THE CHIEF	ES	0401	DEPUTY CHIEF INTERNATIONAL FORESTRY	WASHINGTON, DC
4-BUSINESS OPERATIONS	ES	0301	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
5-BUSINESS OPERATIONS	ES	0560	DIRECTOR STRATEGIC PLANNING AND BUDGET	WASHINGTON, DC
6-NORTHERN RESEARCH STATION	ES	0340	ACCOUNTABILITY	MADISON, WI
7-OFFICE OF THE CHIEF	ES	0260	RESEARCH STATION DIRECTOR	WASHINGTON, DC
8-STATION DIRECTOR-SOUTHERN RESEARCH STATION	ES	0460	DIRECTOR, CIVIL RIGHTS	WASHINGTON, DC
9-BUSINESS OPERATIONS	ES	0301	RESEARCH STATION DIRECTOR	ASHEVILLE, NC
10-EASTERN REGION, REGION 9	ES	0340	DIRECTOR, NATIONAL JOB CORPS	WASHINGTON, DC
11-CHIEF FINANCIAL OFFICER	ES	0501	REGIONAL FORESTER	MILWAUKEE, WI
12-SOUTHWESTERN REGION, REGION 3	ES	0460	DIRECTOR, BUDGET AND FINANCE	ALBUQUERQUE, NM
13-NATIONAL FOREST SYSTEM	ES	0460	REGIONAL FORESTER	ALBUQUERQUE, NM
14-OFFICE OF THE CHIEF	ES	0460	DEPUTY CHIEF	WASHINGTON, DC
15-STATE AND PRIVATE FORESTRY	ES	0301	CHIEF FORESTER	WASHINGTON, DC
16-STATE AND PRIVATE FORESTRY	ES	0460	DIRECTOR, FIRE & AVIATION MANAGEMENT	WASHINGTON, DC
17-LAW ENFORCEMENT AND INVESTIGATIONS	ES	1811	DEPUTY CHIEF	WASHINGTON, DC
18-BUSINESS OPERATIONS	ES	0341	DIRECTOR, LAW ENFORCEMENT & INVESTIGATIONS	WASHINGTON, DC
19-DEPUTY CHIEF, RESEARCH AND DEVELOPMENT	ES	0301	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
20-OFFICE OF THE CHIEF	ES	0460	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
21-DEPUTY CHIEF, RESEARCH AND DEVELOPMENT	ES	0340	ASSOCIATE CHIEF FORESTER	WASHINGTON, DC
22-STATE AND PRIVATE FORESTRY	ES	0401	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
23-NATIONAL FOREST SYSTEM	ES	0340	DIRECTOR, FOREST HEALTH PROTECTION	WASHINGTON, DC
24-NORTHERN REGION, REGION 1	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
25-BUSINESS OPERATIONS	ES	0301	REGIONAL FORESTER	MISSOULA, MT
26-OFFICE OF THE CHIEF	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
			DIRECTOR, WORK ENVIRONMENT AND PERFORMANCE	WASHINGTON, DC

27-NATIONAL FOREST SYSTEM	ES	0460	DIRECTOR, FOREST MANAGEMENT	FLAGSTAFF, AZ
28-DEPUTY CHIEF, RESEARCH AND DEVELOPMENT	ES	0401	DIRECTOR, INVENTORY, MONITORING AND ASSESSMENT	WASHINGTON, DC
29-PACIFIC NORTHWEST RESEARCH STATION	ES	0340	RESEARCH STATION DIRECTOR	PORTLAND, OR
30-DIRECTOR, PACIFIC SOUTHWEST RESEARCH STATION	ES	0340	RESEARCH STATION DIRECTOR	ALBANY, CA
31-PACIFIC SOUTHWEST REGION, REGION 5	ES	0340	REGIONAL FORESTER	VALLEJO, CA
32-STATE AND PRIVATE FORESTRY	ES	0401	DIRECTOR, COOPERATIVE FORESTRY	WASHINGTON, DC
33-NATIONAL FOREST SYSTEM	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
34-SOUTHERN REGION, REGION 8	ES	0340	REGIONAL FORESTER	ATLANTA, GA
35-OFFICE OF THE CHIEF	ES	0301	SENIOR ADVISOR	LAKEWOOD, CO
36-CHIEF FINANCIAL OFFICER	ES	0340	ASSOCIATE CHIEF FINANCIAL OFFICER	WASHINGTON, DC
37-NATIONAL FOREST SYSTEM	ES	0480	WDLIFE & FISH RESOURCES MANAGER	ARLINGTON, VA
38-CHIEF FINANCIAL OFFICER	ES	0501	CHIEF FINANCIAL OFFICER	WASHINGTON, DC
39-BUSINESS OPERATIONS	ES	0341	DEPUTY CHIEF	WASHINGTON, DC
40-BUSINESS OPERATIONS	ES	1102	DIRECTOR, PROCUREMENT AND PROPERTY SERVICES	WASHINGTON, DC
41-STATE AND PRIVATE FORESTRY	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
42-NATIONAL FOREST SYSTEM	ES	0401	DIRECTOR, RECREATION & HERITAGE RESOURCES STAFF	WASHINGTON, DC
43-NATIONAL FOREST SYSTEM	ES	0340	DIRECTOR ECOSYSTEMS MANAGEMENT	WASHINGTON, DC
44-NATIONAL FOREST SYSTEM	ES	0340	COORDINATION	WASHINGTON, DC
45-INTERMOUNTAIN REGION, REGION 4	ES	0340	ASSOCIATE DEPUTY CHIEF	OGDEN, UT
46-ALASKA REGION, REGION 10	ES	0340	REGIONAL FORESTER	JUNEAU, AK
47-OFFICE OF THE CHIEF	ES	0301	CHIEF OF STAFF	WASHINGTON, DC
48-NATIONAL FOREST SYSTEM	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
49-BUSINESS OPERATIONS	ES	2210	ASSISTANT CHIEF INFORMATION OFFICER	BOISE, ID
50-STATE AND PRIVATE FORESTRY	ES	0340	ASSOCIATE DEPUTY CHIEF	WASHINGTON, DC
51-PACIFIC NORTHWEST REGION, REGION 6	ES	0340	REGIONAL FORESTER	PORTLAND, OR
52-BUSINESS OPERATIONS	ES	0201	DIRECTOR, HUMAN RESOURCES MANAGEMENT	ALBUQUERQUE, NM OR WASHINGTON, DC

53-ROCKY MOUNTAIN RESEARCH STATION	ES	0340	RESEARCH STATION DIRECTOR	FORT COLLINS
54-NATIONAL FOREST SYSTEM	ES	0340	DIRECTOR LANDS, REALTY, AND MGM	WASHINGTON, DC
55-NATIONAL FOREST SYSTEM	ES	0340	DIRECTOR FOREST MANAGEMENT, RANGE MANAGEMENT, AND VEGETATION	WASHINGTON, DC
56-RESEARCH AND DEVELOPMENT	ES	0401	DIRECTOR, SUSTAINABLE FOREST MANAGEMENT RESEARCH	WASHINGTON, DC

SCIENTIFIC AND SENIOR LEVEL				
ORG_CODE_LEVEL_2_DESCR	PAY_PLAN	OCC_SERIES	POSITION_TITLE	DUTY_CITY_STATE
PACIFIC NORTHWEST RESEARCH STATION	ST	0486	SUPERVISORY RESEARCH WILDLIFE BIOLOGIST	LA GRANDE, OR
ROCKY MOUNTAIN RESEARCH STATION	ST	0460	SUPERVISORY RESEARCH FORESTER	MISSOULA, MT
PACIFIC NORTHWEST RESEARCH STATION	ST	1315	RESEARCH HYDROLOGIST	CORVALLIS, OR
DIRECTOR, INTERNATIONAL INSTITUTE OF TROPICAL FORESTRY	ST	1301	RESEARCH PHYSICAL SCIENTIST	LOS ANGELES, CA
NORTHERN RESEARCH STATION	ST	0414	RESEARCH ENTOMOLOGIST	MORGANTOWN, WV
PACIFIC NORTHWEST RESEARCH STATION	ST	0486	RESEARCH WILDLIFE BIOLOGIST	PORTLAND, OR
NORTHERN RESEARCH STATION	ST	0486	RESEARCH WILDLIFE BIOLOGIST	COLUMBIA, MO
DIRECTOR, FOREST PRODUCTS LABORATORY	ST	0403	RESEARCH MICROBIOLOGIST	MADISON, WI
STATION DIRECTOR-SOUTHERN RESEARCH STATION	ST	0460	RESEARCH FORESTER	RESEARCH TRIANGLE PA, NC
ROCKY MOUNTAIN RESEARCH STATION	ST	0435	RESEARCH PLANT PHYSIOLOGIST	MOSCOW, ID
ROCKY MOUNTAIN RESEARCH STATION	ST	0408	SUPERVISORY RESEARCH ECOLOGIST	MISSOULA, MT
ROCKY MOUNTAIN RESEARCH STATION	ST	0408	RESEARCH ECOLOGIST	PROVO, UT
DEPUTY CHIEF, RESEARCH AND DEVELOPMENT	SL	0460	SENIOR FORESTER	WASHINGTON, DC
NORTHERN RESEARCH STATION	ST	0408	RES ECOLOGIST	RHINELANDER, WI
STATION DIRECTOR-SOUTHERN RESEARCH STATION	ST	0408	RESEARCH ECOLOGIST	ASHEVILLE, NC
ROCKY MOUNTAIN RESEARCH STATION	ST	0470	RESEARCH SOIL SCIENTIST	MOSCOW, ID

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May 1, 2023

Senator Joe Manchin
Chair, Committee on Energy and Natural Resources
306 Hart Senate Office Building
Washington, DC 20510

Senator John Barrasso
Ranking Member, Committee on Energy and Natural Resources
307 Dirksen Senate Office Building
Washington, DC 20510

RE: April 18 Hearing to Examine the President's Budget Request for the U.S. Forest Service for Fiscal Year 2024.

Dear Chair Manchin, Ranking Member Barrasso, and members of the Committee,

On behalf of the human powered outdoor recreation community, thank you for holding April 18th's hearing on the FY2024 budget request for the USDA Forest Service (USFS).

Outdoor Alliance is a coalition of ten member-based organizations representing the human powered outdoor recreation community. The coalition includes Access Fund, American Canoe Association, American Whitewater, International Mountain Bicycling Association, Winter Wildlands Alliance, The Mountaineers, the American Alpine Club, the Mazamas, Colorado Mountain Club, and Surfrider Foundation and represents the interests of the millions of Americans who climb, paddle, mountain bike, backcountry ski and snowshoe, and enjoy coastal recreation on our nation's public lands, waters, and snowscapes.

Forest Service lands provide irreplaceable ecosystem services and economic benefits and include many of our nation's most valued outdoor recreation destinations. The USFS has been underfunded and understaffed for decades, hampering its ability to meet even the most basic aspects of its mission, much less the needs of a 21st century America. As outdoor recreation grows in popularity, investments in USFS recreation and planning staff—along with job improvements



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to support employee recruitment and retention—are greatly needed to support a thriving, sustainable recreation community and outdoor economy.

Summary of Funding Recommendations:

Item	Outdoor Alliance Recommendation
Recreation, Heritage, and Wilderness	\$94.367M
Land Mgmt. Planning, Assessment and Monitoring	\$26.429M
Capital Improvements and Maintenance, Trails	\$27.857M ¹
Capital Improvements and Maintenance, Roads	\$109.64M
Legacy Roads and Trails	\$100M
Forest and Rangeland Research	\$413.369M
<i>Note: All recommendations should be accompanied by commensurate increases in Salaries and Expenses.</i>	

Outdoor Alliance and our member organizations have a unique perspective on how Forest Service staffing and funding shortfalls have affected outdoor recreation, public access, and preservation of wild places and biodiversity. A hollowed-out career workforce has left the Forest Service hamstrung in its ability to keep up with current management demands, let alone proactively respond to climate impacts and growing outdoor recreation. Climate change, and particularly fire, have stretched the capacity of land management agencies to the point that they are unable to deliver on their other stewardship responsibilities, including providing visitor services, protecting resources, maintaining recreational and other infrastructure, and engaging in medium and long-term planning. For example, the agency estimates that more than 1,000 recreation sites were damaged by wildfire in 2020 and 2021 alone and that repairing these damages will cost more than \$126 million. These impacts—and decades of declining budgets in real-dollar terms—have stretched the agency to the breaking point, and it is essential that Congress provide the resources that will enable land managers to address climate impacts and provide the recreational resources and services that Americans expect and that provide significant return on investment, particularly for rural communities.

In recent years, the Great American Outdoors Act, the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act provided targeted investments to help

¹ This number incorporates a request for \$11.957M for National Scenic and Historic Trails.



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the USFS keep pace with increasing demands across our national forests. While greatly needed, these investments were intended to be additional to a robust baseline budget for the USFS. Increased appropriations from Congress, including investments in recreation and planning staff, are needed to help plan and facilitate projects funded through the GAOA, IJA, and IRA, including where work is being completed with support from partners.

Additionally, we see a need to address hiring and employee retention challenges at the USFS. Through our work with forest-level staff, we see multiple examples throughout the National Forest system where the agency is unable to fill open positions related to planning, recreation, and conservation. Challenges with hiring include salary levels that haven't kept pace with inflation or cost-of-living, staff housing challenges in rural areas bordering National Forests, lack of incentives for applicants to relocate to remote areas, and a need for better agency recruiting and mentorship. The IRA provided significant one-time funding to fill staffing vacancies at the National Park Service, but similar funding is also needed at the Forest Service. We encourage the Committee to explore how to best address these ongoing staffing challenges.

Our specific requests follow.

Recreation, Heritage, and Wilderness: \$94.367M. Outdoor Alliance strongly supports the agency's request for \$94.367M for Recreation, Heritage, and Wilderness—the agency's primary account for providing sustainable recreation opportunities to the American public. National Forests have seen a steady increase in recreational visits over the past decade.² However, between 2002 and 2020 the Recreation, Heritage, and Wilderness program saw a 48% decrease in staffing and a 27% decrease in appropriations adjusted for inflation according to agency budget justification data. Funding at the agency's full FY24 request of \$94.367M will help the Forest Service proactively manage recreational use and deliver the opportunities that support local economies.

Land Management Planning/Assessment/Monitoring: \$26.429M. Forest plans form the foundation for sustainable recreation opportunities and restoration activities

² See, Gwendolyn Aldrich and Evan Hjerpe, The Conservation Funding Crisis, Conservation Economics Institute (2022), at 16, *available at* https://www.conservationecon.org/_files/ugd/5fc209_964863909ec745818cdb5a8643623366.pdf.



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across our National Forests. Forest plan revisions are supposed to occur every 15 years, but currently, 99 out of 128 Forest Service land management plans are older than 15 years. The outdoor recreation community supports the Forest Service's efforts to make forest planning more efficient and responsive to stakeholder input through a new national initiative called the Planning Service Organization. An increase to Land Management Planning, Assessment, and Monitoring is needed to put this new organization into action and to initiate more than 30 plan revisions over the next four years, including seven beginning in 2024.

Capital Improvements and Maintenance, Trails: \$27.857M. The Forest Service manages more than 160,000 miles of trails, which provide access to extraordinary scenic, cultural, and ecological resources across the National Forest system. Increasing trails funding will help the agency maintain this irreplaceable trail system, expand the trail system where appropriate, and strengthen partnerships with local trails organizations.

Capital Improvements and Maintenance, Roads: \$109.64M. Forest Service roads, bridges, and parking lots are critical access points for outdoor recreationists. Significantly increased resources are needed to help the agency improve recreation access and increase the resilience of the extensive Forest Service road system to extreme weather events.

Legacy Roads and Trails: \$100M. Outdoor Alliance supports the Washington Watershed Restoration Initiative's request for \$100M for Legacy Roads and Trails. Although Congress permanently authorized this program in the 2021 Infrastructure Investment and Jobs Act (IIJA) at \$50M per year, this number does not meet the existing need for road and trail repair, road decommissioning, and other needs. The Forest Service has identified a backlog of more than \$4.4 billion in deferred maintenance for its road system. The IIJA investments should be augmented with an additional \$100M from the USFS budget to help the agency prevent adverse impacts to water quality, sensitive species, and outdoor recreation from USFS roads.

Forest and Rangeland Research: \$413.369M. Forest Service research is critical to understanding our natural world. This research is more important than ever in a changing climate and with novel pressures facing our National Forests and Grasslands. An increase in forest and rangeland research funding will bring much-



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needed capacity to address pressing ecological questions and develop new techniques for forest and rangeland management.

* * *

Thank you for considering the perspectives of the outdoor recreation community on the need for increased investment in the capacity of the USDA Forest Service to deliver on its stewardship responsibilities.

Best regards,



Louis Geltman
Policy Director
Outdoor Alliance

cc: Adam Cramer, Chief Executive Officer, Outdoor Alliance
Chris Winter, Executive Director, Access Fund
Beth Spilman, Executive Director, American Canoe Association
Clinton Begley, Executive Director, American Whitewater
Kent McNeill, CEO, International Mountain Bicycling Association
David Page, Executive Director, Winter Wildlands Alliance
Tom Vogl, Chief Executive Officer, The Mountaineers
Ben Gabriel, Executive Director, American Alpine Club
Kaleen Deatherage, Interim Executive Director, the Mazamas
Keegan Young, Executive Director, Colorado Mountain Club
Chad Nelsen, Chief Executive Officer, Surfrider Foundation

