



Response to Congressional Directive on National Forest System and Research and Development Communication and Coordination

The Senate report that accompanied the Consolidated Appropriations Act of 2024 (P.L. 118-42) included the following request:

The Committee is concerned with a lack of communication and coordination between the National Forest System and Research and Development and directs the Service to produce a plan to improve the coordination between these Deputy Areas, within 180 days of the enactment of this act.

This report is the U.S. Department of Agriculture (USDA) Forest Service response to the request. The Deputy Chiefs for the National Forest System and Research and Development would be pleased to provide a briefing on this report.

Background

Within the Forest Service, the National Forest System (NFS) and Research and Development (R&D) deputy areas have a long and productive history of effective coordination, communication, and collaboration at multiple scales, resulting in meaningful science-management integration at the agency. The Forest Service is the only land management agency with a dedicated R&D branch, which strengthens our agency's ability to make science-based decisions and provides an important platform for coordination with others, including Federal agencies, State agencies, Tribes, and partners. Many of the agency's priorities, including the Wildfire Crisis Strategy, management of the national forests and grasslands, climate change adaptation, bio-based economy, and recreation, serve as key avenues for science-management integration.

Even with successful examples of coordination, R&D researchers and NFS managers face substantial differences related to the scope and scale of questions, timelines, funding mechanisms, and career advancement. Also, the agency's established institutional processes, a continuing decline in the number of research scientists and professionals, and limited access to advanced information technologies can hinder coordination. Achieving effective, durable, and mutually beneficial coordination takes commitment and resources from both R&D and NFS. (See the appendix for relevant information about the R&D Organizational Structure.)

In addition, the Forest Service operates within an increasingly complex social and ecological landscape, where the scale and pace of natural resource related challenges continues to increase. The agency generates and has access to tremendous amounts of data and information; however, working together across deputy areas to nimbly apply this information for decision support can pose significant challenges within current organizational and technological constraints.

In this report, we highlight recent and current examples of science-management integration and propose several elements of a plan to enhance and modernize science-management integration across the agency and in our partnerships. While the report is focused on the NFS and R&D relationship, as requested by the directive, we acknowledge the important roles of many others, including the agency's State, Private, and Tribal Forestry deputy area, State partners, Tribes and tribal organizations, and universities, in science-management integration.

Highlights of Ongoing Efforts

Coordination for science-management integration between NFS and R&D takes place at numerous scales, including:

- Local coordination, typically at a national forest, district, or other localized level
- Region and station coordination, typically for issues specific to a region or to national forests in a region
- National-level coordination, typically for broader issues, priority topics, or policies with national implications, often with coordination and leadership from Washington Office

Here we highlight a few recent examples of national-level coordination between NFS and R&D (additional examples of ongoing coordination provided in appendix):

- **Mature and Old-Growth Forests** – In response to Executive Order 14072 *Strengthening the Nation's Forests, Communities, and Local Economies*, which requires developing definitions for mature and old-growth forests, conducting an inventory of those forests, completing a threat analysis, and establishing a conservation policy, NFS partnered with R&D for data from the Forest Inventory and Analysis (FIA) program and for technical expertise. R&D provided the scientific foundation for the agency's decisions on a national approach to determine the geographic extent and distribution of mature and old-growth forests on NFS and Bureau of Land Management lands. R&D further supported the analysis of threats to mature and old-growth forests using projections and models from the 2020 Resources Planning Act (RPA) assessment and is actively supporting the development of the National Old Growth Amendment. Because the R&D FIA program and RPA assessment were already collecting and analyzing data relevant to this effort, the mature and old-growth forest inventory and threat assessment were produced efficiently and credibly. Collaboration will continue as monitoring of mature and old growth, using remeasured FIA data, will inform adaptive management decisions by NFS.
- **Wildfire Crisis Strategy** – Forest Service R&D, including with long-term datasets produced by the FIA program, produced the scientific foundation of the Wildfire Crisis Strategy. Decades-long cooperation between R&D and State, Private, and Tribal Forestry Fire and Aviation Management has produced applied fire modeling, training curricula, decision support systems, and national datasets that are used across Federal and State agencies engaged in wildfire management. R&D models, tools, applications, and processes have become thoroughly embedded in the day-to-day functions of the Forest Service and are widely used by partners outside the agency. R&D is supporting NFS and the Wildfire Crisis Strategy's 21 priority landscapes in a variety of ways, including the

development of performance metrics that reflect landscape outcomes across a range of resource values and analytic support in using the performance metrics for planning, reporting accomplishments, and monitoring. The unprecedented investment and large spatial scale of fuels and forest health treatments have made this a tremendous opportunity to learn how our actions influence wildfire risk and ecological resilience, in turn enabling us to adapt our management.

- Land management plans are required to use the best available science. Researchers are frequently consulted during the plan revision process, including at the assessment and environmental impact statement phases and when developing the need for change and record of decision. Forest Service R&D, at national, regional, and local levels, is producing and translating the best available scientific information to directly inform the development of all 128 land management plans and subsequent monitoring program covering the entire National Forest Systems. The R&D-produced Resource Planning Act (RPA) assessment is referenced in the 2012 Planning Rule directives as an example of best available science.
- In response to growing needs around quantifying the climate impacts of forest management activities as well as greenhouse gas fluxes across national forests and grasslands, R&D has been actively providing extensive direct technical support to NFS. This includes R&D supporting NFS compliance with updated Council on Environmental Quality NEPA guidance; engaging in the Carbon Partnership Program; supporting the USDA Climate-Smart Executive Dashboard and an internal application that tracks greenhouse gas benefits of agency programs; and advancing the NFS Forest Vegetation Simulator software.
- R&D has provided numerous data layers for incorporation into the Forest Service Climate Risk Viewer, developed in response to the Secretary's Memorandum on Climate Resilience and Carbon Stewardship (1077-004) to support climate adaptation by resource managers. For example, several data layers from the 2020 RPA assessment, including county-scale projections of forest area, total carbon, and water demand, are incorporated in this tool.

Plan for Future Coordination

The Forest Service acknowledges that as resource conditions change, science evolves, and the demand for nimble, collaborative, co-produced efforts grows, there are opportunities to organize, strengthen, and modernize our internal coordination. The NFS and R&D welcome the interest and the support of congressional colleagues in pursuing enhanced opportunities to integrate management and science. Below are three aspects of a plan to better understand the state of agency communication, coordination, and collaboration, and to identify and address the opportunities and challenges.

1. Internal assessment of needs and usages:

- a. Conduct an internal survey, coordinated across the deputy areas, to better understand current product and tool usage and expectations for future needs. This would help us assess what science products and tools are most useful to land management planning and

how to efficiently adapt and adopt such tools across the agency, as well as anticipate necessary information technology funding levels needed to develop and maintain applications.

- b. We commit to pursue the proposal from congressional staffers to conduct an internal study, as described in the current draft of the fiscal year 2025 Senate report:
 - i. Forest Service R&D is continually developing new and innovative tools to help land managers and decision makers manage public lands and policy more efficiently and effectively, based on cutting-edge science. The Deputy Chief of Research and Development, in coordination with the Deputy Chief of the National Forest System, shall develop and administer to internal Forest Service units a survey to better understand the opportunities and challenges associated with use of recent science tools, applications, and delivery. The Forest Service will brief the Committee on the results of such a survey within 270 days of enactment of this act.
 - c. This assessment could help develop metrics to establish a baseline of the effectiveness of current coordination and quantify improvements resulting from efforts to promote more coordination.
2. Internal analysis of relevant organizations and procedures that facilitate and augment coordination and pursuing improved and more structured means to coordinate. Examples include:
- a. Using existing internal groups to focus attention on and improve awareness of roles in science-management coordination.
 - i. Provide time for all deputy groups to learn about R&D developments on priority topics, as well as time for discussion on presentation topics and opportunities to enhance integration. We have several existing leadership groups that meet regularly. For some of the groups, we have added a standing agenda topic that allows leadership dedicated time to consider and provide leadership intent on science-management integration. For example, for the National Leadership Council, for both of its meetings thus far in 2024, we have featured the topic of science-management integration.
 - ii. Commit to an annual leadership meeting focused on identifying future year data and research needs and how the agency will work together to meet these needs.
 - iii. Encourage NFS and R&D discipline and program leads to jointly facilitate cross-deputy communities of practice that meet regularly to share science and management connections.
 - b. Pursuing more formalized cross deputy groups in the agency. The following examples of science-management integration are being established in more formalized ways:
 - i. Outcome performance metrics: NFS and R&D are beginning coordination efforts across multiple program areas, disciplines, and research stations to develop and establish a set of methods and metrics for quantifying landscape conditions, wildfire

risk, and economic outputs of Wildfire Crisis Strategy investments. Analysis methods will be reproducible and consistent across landscapes, and outputs will be updated at annual time steps to track changes across resources, as appropriate for each metric. Metrics will reflect values and conditions that are informative for assessing landscape conditions and useful for evaluating the impacts of management investments.

ii. National Carbon Analysis Center: The agency is standing up a joint NFS and R&D National Carbon Analysis Center to provide timely carbon analyses . The center is responsive to urgent and immediate needs for carbon analyses to support agency work ranging from project-level NEPA to national efforts such as the National Old Growth Amendment. The primary focus of the center is on national-scale analyses, which can be downscaled in a consistent way to smaller areas, and repeated, small-scale analyses that are required nationally. It will develop workflows for granular analytical needs that can be repeated at unit or project scales using consistent methodology, regardless of region, land management intent, land cover, or land ownership.

c. Review existing R&D-focused procedures, such as strategic plan development, research station charter development, and others, to consider opportunities to institutionalize more formal requirements for science-management integration.

3. Commit to an annual science summit:

a. Given recent success with the Mature and Old Growth Science Summit in March 2024, a national-level science-focused leadership gathering, we are committed to holding at least one annual science summit. We will consider whether the summit should be focused on a specific topic or span a range of key topics for which there have been recent scientific advancements that leadership should be aware of. Future topics could include wildfire, climate and carbon, water, bio-based economy, or others.

Appendix

Research and Development (R&D) Organizational Structure

The Forest Service R&D branch employs about 1,500 of the agency's roughly 34,000 total employees. Of these 1,500 R&D employees, approximately 450 are classified as research scientists, which is about half the number of scientists when compared to prior decades.

Publishing peer-reviewed studies is a strong component of research organizations and factors in to how a research scientist's performance is evaluated; thus, a research scientist's career advancement is based in part on their peer-reviewed scientific work. Government policy, organizational culture, and the research focus of a position shape the extent to which the scientist is expected to emphasize significant consultation, dissemination, science delivery, and co-production.

Forest Service research is conducted at numerous locations and is organized around five research stations and two research laboratories. These facilities are strategically co-located with national forest facilities and university research institutions and encompass the diversity of natural resources across the country. Forest Service R&D is unique in the scope and scale at which we investigate questions facing forest and rangeland management.

Additional Examples of Ongoing Coordination

National-Level Examples

- The Forest Service Wood Innovations program supports projects that will substantially expand and accelerate wood products and wood energy markets throughout the United States. The intent is to stimulate, expand, and support U.S. wood products and wood energy markets to support long-term management of National Forest System (NFS) lands and other forest lands while enhancing the economic and environmental health of communities.
- The Office of Innovation and Organizational Learning (IOL) is based in Forest Service R&D and designed to be a boundary spanning group that focuses on creating bridges and feedback loops among different communities of practice. IOL engages in this work through two main avenues. First, IOL delves into accident reviews as a means of planting seeds for long-term organizational improvement. Second, IOL conducts an annual "year-in-review" that relies on end of year focus group sessions that give employees the opportunity to talk about challenges, barriers, and innovations in the previous year, which are summarized and presented to Forest Service leadership.
- R&D developed projections of wildfire suppression expenditures from 2020 through 2100 as part of a larger effort to assess "financial climate risk" across the Federal government. These projections were included in the President's fiscal year 2025 budget and supported the bipartisan congressional fix for how the Forest Service is funded for fighting wildfires.
- To maintain communication, coordination, and awareness of the needs of the NFS for scientific expertise and information, several R&D programs host regular listening

sessions or forums that include representatives from the NFS. For example, the Forest Inventory and Analysis (FIA) program hosts quarterly meetings that include NFS regional and national representatives, State agency partners, and other deputy areas including State, Private, and Tribal Forestry, as well as an annual user group meeting. A key part of these engagements is ongoing discussion about actions the FIA program has taken to address previous feedback.

Regional-Level Examples

- In 2023, the Pacific Southwest Research Station and Pacific Southwest Region established a co-production partnership for larger scale applied research initiatives. The first co-produced projects developed with this approach began in February 2024. Initial efforts aim to promote resilient young forests that tolerate prescribed fire, increase social acceptance of fuels treatments in the wildland urban interface, and restore traditional agroforestry systems that mitigate the impacts of climate change. All of these projects involve R&D scientists working hand-in-hand with their NFS counterparts, applying state-of-the-art science to address complex, high priority issues. The collaboration continues from research planning through execution and delivery.
- The Eastern Region, Northern Research Station, and Forest Products Laboratory initiated a Combined Eastern Leadership Team to build on grassroots efforts to work collaboratively between national forests and local research station units. This effort has adapted over the past two years to maintain cross population at leadership team meetings along with highlighting examples of working together on more projects at the local unit level.
- NFS Region 1 has relied on FIA inventory data extensively during the land management planning process. Since 2009, FIA data has been used to understand current vegetation conditions and determine desired future conditions for six national forests, while three other national forests are using FIA data during their ongoing plan revision efforts. As indicated in the 2012 Planning Rule, Region 1 has used FIA data to quantify status and monitor trends of key vegetation indicators in the most recent broad-scale monitoring reports (2020, 2025) and in all forest-level biennial monitoring reports where plan revision was completed by 2021.
- NFS Regions 1, 4, and 6 have all used FIA data during the U.S. Fish and Wildlife Service consultation process in response to the listing of whitebark pine as a threatened species. Use of FIA data allowed the development of consistent data and metrics to assess and monitor whitebark pine status and trends across all regions where it occurs. Currently, scientists at the Rocky Mountain Research Station are developing a climatic suitability model and map for whitebark pine under various future climate scenarios, using FIA data for model calibration and validation. The outcome of that modeling effort will be a map that allows managers to prioritize where to restore or plant whitebark pine based on locations where it is likely to thrive in the future.
- The Southern Research Station plays a critical role in the training and development of NFS Region 8 silviculturists. Researchers and staff from Southern Research Station, in

partnership with Region 8, lead the coordination and development of two regional short courses as part of the National Advanced Silviculture Program (NASP): the Southern Pine Module and the Mountain Module. These two-week short courses are required for all current NASP students in Region 8 (and many from Region 9) and also provide continuing education credits and training for certified silviculturists and other forestry professionals inside and outside the agency. These short courses are an extension of the national training received by NFS silviculturists and provide certification and recertification students with the best available, interdisciplinary science needed to develop and implement sound silvicultural prescriptions necessary to meet agency vegetation management goals and objectives.

Local-Level Examples

- In the Cameron Peak and East Troublesome Fire (Colorado) burned areas, Rocky Mountain Research Station scientists are co-developing watershed restoration and reforestation research with the Arapaho-Roosevelt National Forest and the Pawnee National Grasslands, Front Range municipal water utilities, and community watershed coalitions.
- The Landscape Change Monitoring System (LCMS) was developed cooperatively by R&D and the Geospatial Technology and Applications Center, using state-of-the-art Landsat time series processing. The LCMS data and tools allow forest managers to study and visualize forest disturbance history across the conterminous United States and coastal Alaska. NFS regional and forest-level staffs have helped identify many applications for LCMS data, including forest planning and plan revision, updating existing vegetation maps, assessing landscape conditions, supporting post-fire recovery, and meeting broad-scale monitoring requirements. For example, on the Bridger-Teton National Forest, LCMS maps have revolutionized landscape restoration efforts after a wildfire. The tool is also being used in the Pacific Northwest to monitor habitat of threatened and endangered species and to update forest carbon assessments across the country.