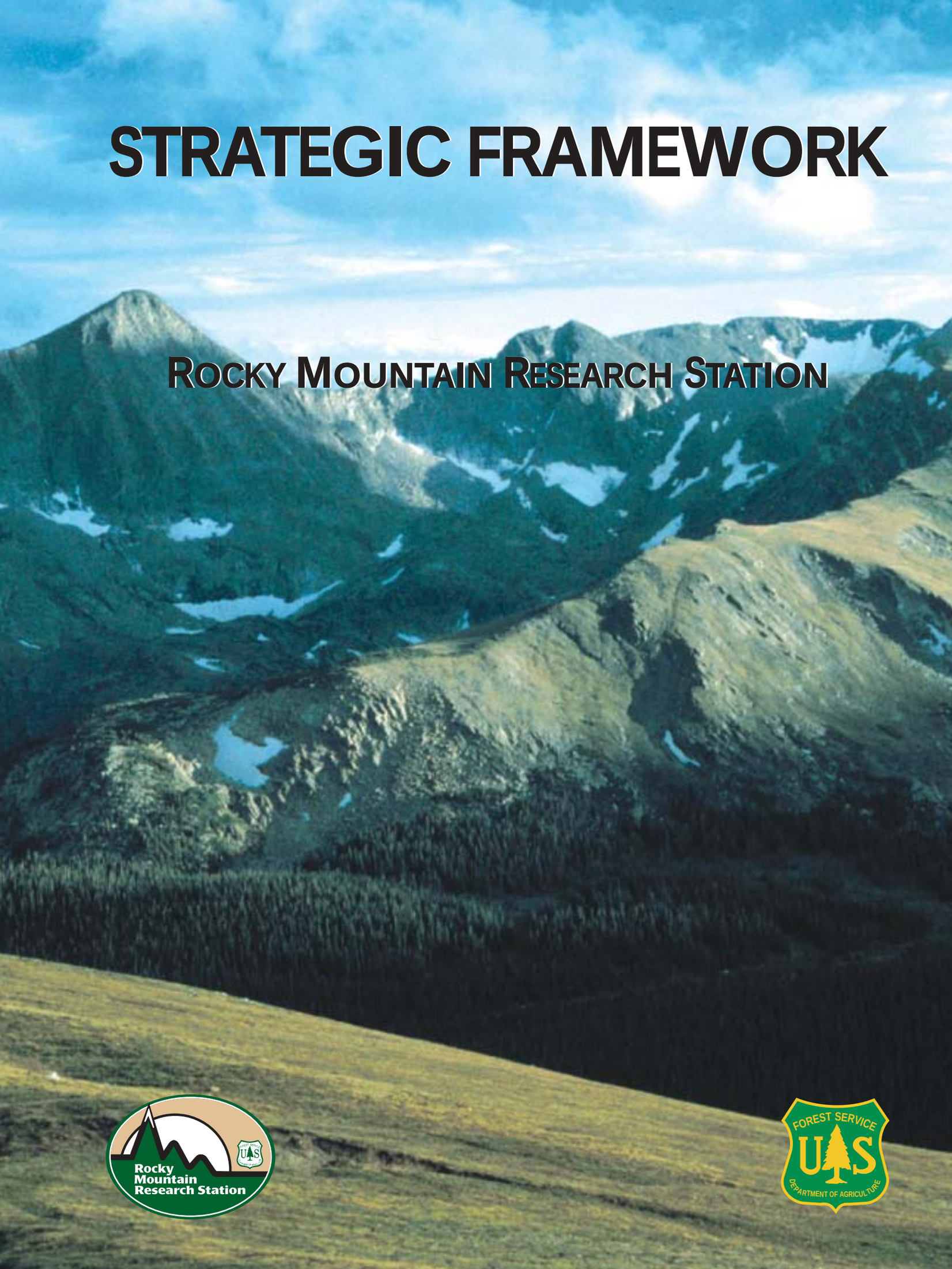
STRATEGIC FRAMEWORK

ROCKY MOUNTAIN RESEARCH STATION



Preface

A strategic plan is a tool for charting a path into the future. This Strategic Framework will help guide the USDA Forest Service Rocky Mountain Research Station over the next decade during inevitable socioeconomic and environmental change. It is the product of a dialog with our stakeholders and employees to examine the Station's capabilities, anticipate research issues, and describe our future role in providing scientific information to sustain the world's natural resources. This Strategic Framework describes how the Rocky Mountain Research Station will help accomplish the goals of the national USDA Forest Service Strategic Plan.

We have collaborated with our partners, land managers, other researchers, and employees to shape a document that will guide us through the maze of decisions we make about our programs and how we accomplish our mission. Employees assessed the Station's strengths, weaknesses, opportunities and threats. We asked our stakeholders: "What natural resource issues, problems, or opportunities are you likely to face within the next two decades that the Rocky Mountain Research Station can help resolve?" We gathered input throughout the Station's territory and Washington, D.C., through workshops, written comments, discussions, and other means.

Future implementation plans will describe the workforce, facilities, and support staff needed to successfully translate the Framework into action. We welcome your continued dialog with us during our implementation.

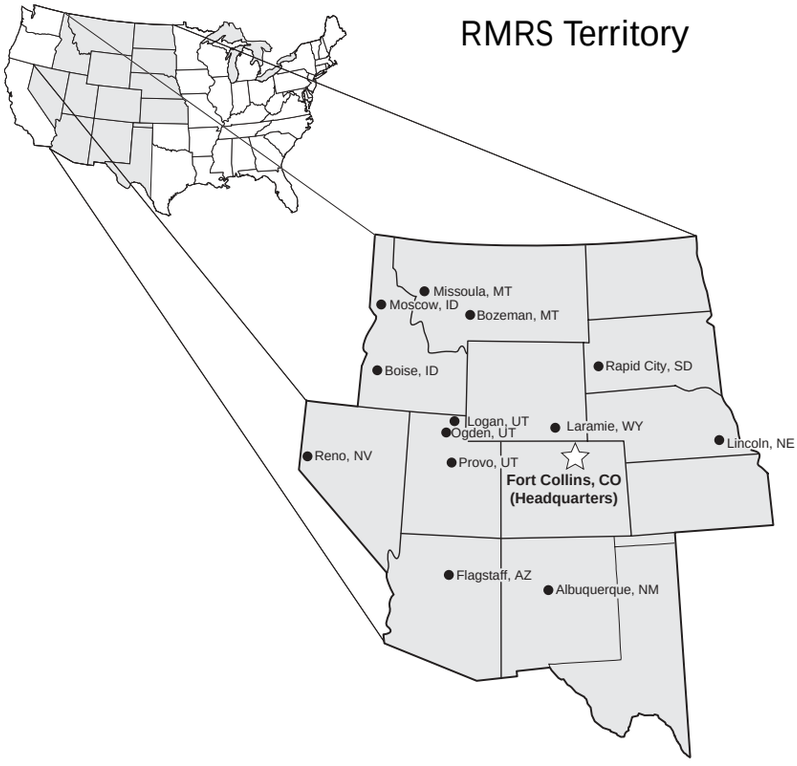
Marcia Patton-Mallory

Station Director

Contents

WHO ARE WE AND WHAT DO WE DO?

As one of seven research stations within USDA Forest Service Research and Development, the Rocky Mountain Research Station (RMRS) is responsible for a large, diverse territory that covers 13 states. Our area stretches across the Rocky Mountains, the Plains States, and the Desert Southwest. Canada borders the north and Mexico borders the south.



Scientists at our 14 field laboratories conduct research that spans an area containing 52% of the nation's National Forest System lands (54 National Forests and Grasslands). In the lower 48 states, our territory also includes 55% of the nation's BLM lands; 48% of the designated wildernesses; 37% of National Park Service lands; numerous other public and tribal lands; and 41% of the non-urban/rural private lands.

Several of our Research Work Units have responsibility for leading national missions that focus on science needs throughout the country. Our national programs are in the following areas:

- National Agroforestry Center
- Fire Sciences
- Wilderness Research Institute
- Forest Planning and Conflict Resolution Technology
- Natural Resources Inventory Techniques
- Cultural Heritage
- Human Values
- Natural Resource Assessments

Fire, water, land use, biological diversity, and other major natural resource issues reside in our territory. As recreational use of public lands steadily increases, the area has become the nation's mountain, forest, grassland, and desert playground. At the same time, the land's health and productivity must be sustained. The social and environmental pressures and the strategies needed to address them are complex. RMRS has the expertise and facilities to conduct large-scale, long-term, interdisciplinary research to help resolve issues. The Station's strong support organization includes operations, statistical, editorial, publishing, library, and administrative functions.

Our strategic framework supports the goals and objectives of the national *USDA Forest Service Strategic Plan.* The goals stated therein are as follows:

Goal 1: Ecosystem Health
Goal 2: Multiple Benefits to People
Goal 3: Scientific and Technical Assistance
Goal 4: Effective Public Service

Our niche will be guided by the behaviors prescribed in the following mission, vision, and values statements. They are the basis of our operating environment.

Mission

Our mission is to develop and deliver scientific knowledge and technology that will help people sustain our forests, rangelands, and grasslands.

Vision

Our science and technology provides society with options on the sustainable use and appreciation of forests and rangelands.

Values

- **Quality Science: objective, unbiased, credible, independent.**

Quality science is the foundation of the Rocky Mountain Research Station's credibility, integrity, and reputation. We are a productive, effective, and interdisciplinary research organization, committed to staying at the forefront of science and safeguarding its integrity and objectivity. New knowledge is provided through a balance of basic and applied research and short- and long-term studies at a variety of scales. Scientists focus on conducting relevant research. To assure public confidence, the Station utilizes statistical, technical, editorial, peer, and relevancy reviews of our programs, study plans, and publications. We are dedicated to professional integrity and ethics. Our scientists and their colleagues adhere to a Forest Research and Development Code of Scientific Ethics.

- **Quality Service: responsive, timely, relevant, customer-focused.**

We focus our research and development activities on questions and issues that are relevant and of concern to our stakeholders. We provide integrated, scientific, cost-effective, and legally defensible information for making wise decisions on sustaining ecosystems. We continually look for better ways to share state-of-the-art knowledge that stakeholders can understand and apply. We seek high levels of effectiveness and accountability and ensure that our administrative processes enable us to efficiently accomplish our mission.

- **Quality Relationships: with partners and among employees.**

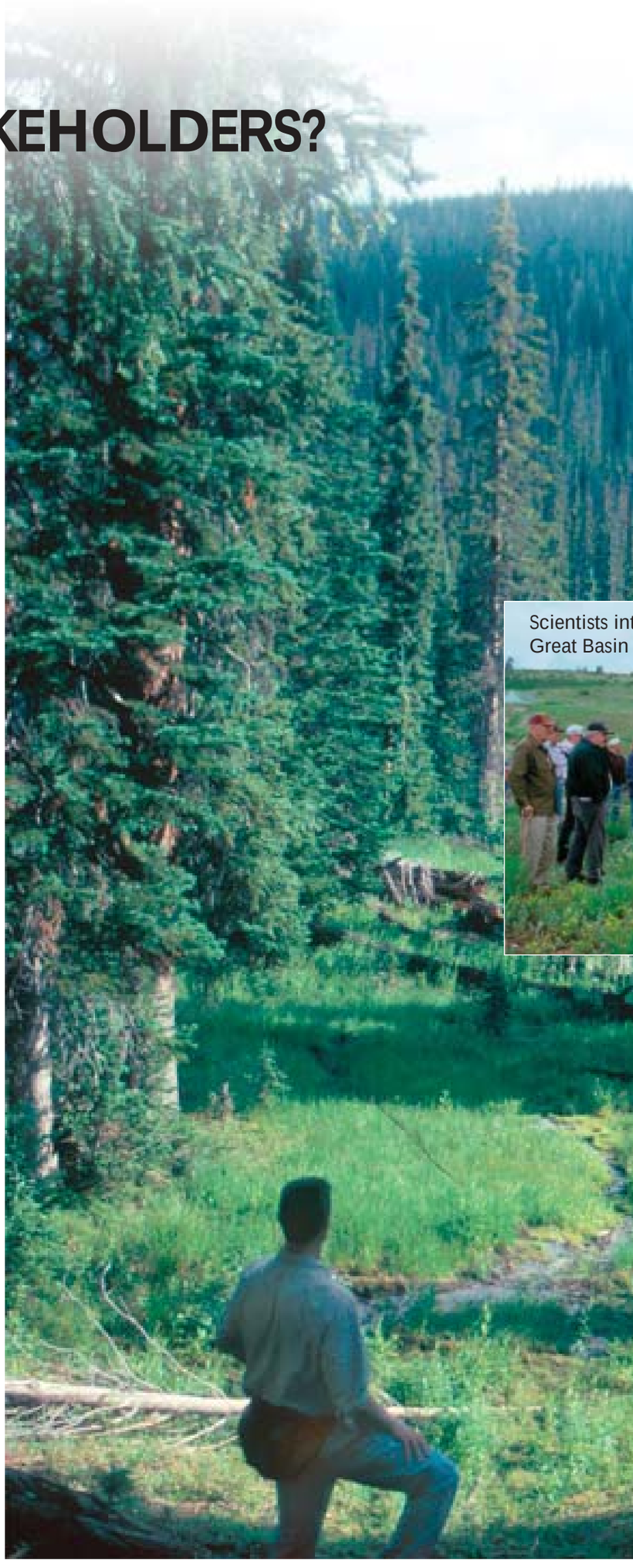
We recognize that listening to our customers produces quality relationships that help us meet the expectations of our stakeholders and the public at-large. The best way to be successful as individuals and as an organization is to build strong, trusting, collaborative relationships. We focus on providing a broad-based science and professional infra-structure through a high-quality, diverse workforce that builds strong working relationships and partnerships with people inside and outside our organization. User feedback assures that our work remains relevant and appropriately evolves for the future.

Research is helping understand how riparian and upland tree buffers can protect water quality, enhance aquatic and terrestrial environments, and sequester carbon.

WHO ARE OUR STAKEHOLDERS?

Anyone who has a role or interest in developing and/or using our research products is a stakeholder. The Station serves the following groups.

- Natural resource scientists, managers, and policymakers in:
  - National Forest System
  - State and Private Forestry
  - Bureau of Land Management
  - National Park Service
  - U.S. Fish & Wildlife Service
  - Agricultural Research Service
  - Natural Resources Conservation Service
  - NASA
  - Environmental Protection Agency
  - U.S. Geological Survey
  - Department of Energy
  - National Laboratories
  - National Oceanic & Atmospheric Administration



Scientists int
Great Basin

Assessment of forage growth under tree cover was one of the field exercises from the 1890 University Faculty Agroforestry Workshop.

teract with stakeholders at the Experimental Range.

- The national and international scientific community
- The Administration and Congress of the United States
- State, county, local, and tribal governments
- The general public
- Private landowners in forest, rangeland, agriculture, and urban settings
- Industry such as timber, mining, ranching, recreation, tourism, and farming
- Colleges and universities, community colleges, and high schools
- Environmental and commodity non-government organizations
- Professional societies
- The media

Our conservation education programs are for all people.

MOUNTING PRESSURES IN THE INTERIOR WEST

The rapid influx of people living and recreating in the Interior West challenges scientists to answer more complex questions and provide information that will help sustain healthy and productive ecosystems. Numerous pressures compel us to form strategies for our research programs.

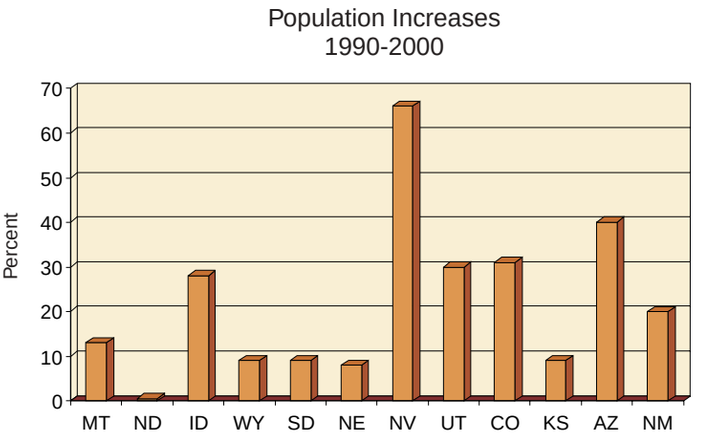
Demands of a Growing Population

People are dramatically increasing their use of western landscapes. As communities sprawl, many forests, deserts, grasslands, shrublands, and riparian areas are threatened and fragmented. Pollutants and invasive species are dispersing throughout formerly undisturbed areas. Less habitat is available for wildlife, fish, and plants. People want public lands for preserving old growth, trees, rare plants and animals, and healthy ecosystems—but they also want abundant clean air and water, heat for their homes, wood products, grazing lands, scenic vistas, recreation, and electricity. Intensified land use and climate change are threatening to push ecosystems beyond the range of sustainability.

Fraser Experimental Forest research project on watershed cutting practi

Inset: Development in Las Vegas, Nevada.

ces, Colorado.



Participation in outdoor activities such as skiing, hiking, camping, sightseeing, and off-highway vehicle use is growing exponentially on our National Forests. People value a place to retreat for solitude, reflection, and personal renewal, often on public lands. Over the next 50 years the U.S. population will shift toward being more urban, older, and more racially and ethnically diverse. Recreational demand from urban users, individuals with disabilities, and people over the age of 55 will increase.

Complex Social Interactions

Public desires are often changing and conflicting. The need to resolve gridlock among various publics and natural resource agencies is growing. As society struggles with ways to integrate ecological, social, and economic values in

managing natural resources, several forces complicate resolution of issues. These forces are:

- Shifts in demographics of society.
- Rapid growth of development in the wildland-urban interface.
- Society's changing values toward natural resources.
- Distrust of government, people of authority, and expertise.
- More public involvement in resource management decision-making.
- An increasingly complex legal environment.
- Complex, trans-boundary problems among public institutions.

Water Supply, Quality, and Demand

The rapidly advancing gap between water supply and demand creates management challenges. National Forests and Grasslands are the largest single source of clean water in the United States and provide 33% of the West's water. Water shortages and sedimentation continue to plague these watersheds. Less water above and below the ground and stresses of periodic drought are creating problems for agriculture, cities, people, riparian areas, and the environment. Water diversions and reduced water flow are fragmenting and altering important aquatic habitats.

Our territory contains the headwaters of nine of the nation's major river systems:

- Missouri, Yellowstone, Platte, and Arkansas, which flow into the Mississipppi
- Salmon, Snake, Columbia, and Colorado, which flow into the Pacific Ocean
- Rio Grande, which empties into the Gulf of Mexico.

Recent Gallup Polls found that the #1 environmental issue Americans worry about is water pollution. Clean water is paramount to sustainability. Water quality, important for drinking water and aquatic habitat, can be negatively affected by logging, mining, catastrophic fire, agriculture, grazing, accelerated erosion, and poorly maintained roads. Understanding watershed systems and the effects of use and management is fundamental to sustaining clean water.

Wildfire and Fire Suppression

Although fire is a natural process in most ecosystems, exclusion of wildfire through suppression and other activities has dramatically altered certain forest types and contributed to unusually dense forests that create a threat of catastrophic fires, especially in the wildland-urban interface. An average of 3.6 million acres of wildlands burned annually throughout the 1990s. In 2000 alone, fire burned 8.4 million acres. In 2002, three western states experienced their largest wildfire on record. Firefighting costs to the federal government soared from $523 million in 1999 to $1.3 billion in 2000 and exceeded $1.2 billion in 2002.

A national policy of promoting fire suppression has contributed to increased forest densities, insects, diseases, dead and dying trees, and high fuel loads in many forests. A smaller forest products industry infrastructure in much of the Interior West makes it difficult to cost-effectively reduce fuels through thinning. Effective ways to harvest and use small-diameter trees are needed. Invasive weeds are changing the fire regimes in rangelands for the worse. We are now faced with an extreme fire risk to natural resources and the safety of communities, especially those at the wildland-urban interface. Firefighters are at ever-increasing risk and we need more efficient and effective ways of fighting fires to protect communities.

The impacts of catastrophic wildfire on other resources such as watersheds can be devastating. Intrusions of wildland smoke on highways and into communities can cause health and safety issues. People's passion for wildlands, along with rapid development into the rural environment, limit the options available for managing forests and rangelands and for mitigating the circumstances.

Sustaining Healthy and Productive Ecosystems

The health and productivity of the land are a result of how we manage disturbance processes such as fire, resource extraction, road construction, and invasive species. Managers need sound methods for making decisions and restoring and maintaining ecosystems. Multiple uses such as recreation, forest products, mining, farming, grazing, and water consumption provide many benefits along with responsibilities for managing risk.

The extraction of forest products carries both benefits and risks.

Insects are attacking drought-stricken, fire-deprived, dense forests while threatening forest health and productivity at alarming rates. Exotic weeds such as cheatgrass are invading and choking out thousands of acres of rangelands needed by livestock and wildlife. Native and exotic forest diseases are spreading significantly across many Interior West forests. Many diseases occur or their effects are exacerbated as a result of other disturbances.

The effects of drought intensify when cities depend on reservoirs like this one for their water supply.

Cheatgrass infestations destroy grazing lands, increase fire risk, and drive out native species.

Rapidly increasing use of land for recreation is beneficial to society but it also increases the impact on the health and productivity of the land. Escalating development on private lands creates more pressure on prized public lands. Landscape fragmentation makes it more difficult to sustain healthy plant and animal communities. Changes in farm operations on the Plains produce new challenges for the sustainability of agroforestry systems.

Mountain pine beetle infestation.

Demand for Science and Technology Assistance

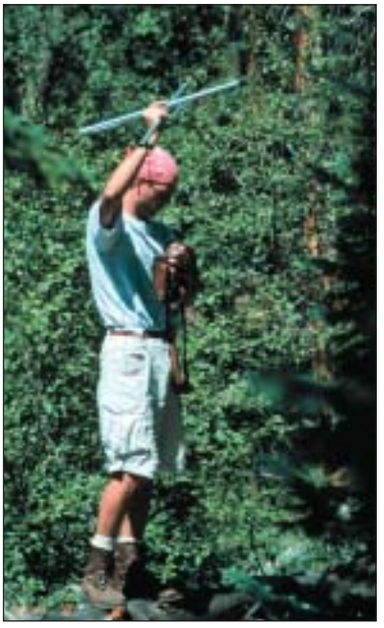
The complexity of natural resource issues in today's world requires managers to understand and have available to them credible scientific information. National Environmental Policy Act (NEPA) regulations and the Courts are demanding that managers demonstrate use of relevant scientific information in their decision-making processes. Land managers need better methods for large-scale inventory, monitoring, and assessment. Significant revisions to National Forest and Grassland Plans in the Interior West increase the demand for the best available scientific information for developing these revisions. Our scientists are effectively delivering this information to users.

Forecasting water supply through snow studies.

Researchers use electrofishing techniques to document and study rare fish species.

Much of the available scientific information is not compiled and integrated. Thus, in addition to producing new scientific information, our scientists are tasked with synthesizing current knowledge and providing state-of-knowledge reports. Scientists and support staff are faced with balancing demands between basic research and the transfer of knowledge. A larger set of customers, including under-represented groups, needs information in ways that are relevant to them. In addition, the public wants more electronic delivery of information through internet and other electronic technologies.

Scientists can reconstruct the history of fire in forests by dating patterns of fire scars in cross-sections of trees.



Specialized equipment is used to study the movements of radio-collared wildlife in the backcountry.

Land-use suitability assessment in an agroforestry system.

RESEARCH AND DEVELOPMENT FOCUS AREAS

The root of future societal and environmental pressures upon the Interior West is the need for maintaining sustainable ecosystems. Our challenge is to better understand and provide scientific information to sustain these ecosystems. Our fixed land base is continuously stretched to accommodate more demands and produce more benefits. Considering this challenge, we identified five programmatic focus areas for research and development. These areas provide guidance for setting priorities during planning and budgeting processes. While not an exclusive list, these focus areas highlight issues that we believe will be at the forefront over the next 5-10 years and where the Station plans to focus at least 70% of its resources.

Stakeholders told us that our program of research must be relevant to land management planning and contribute significantly to using and sustaining natural resources. Therefore, we have included a sixth focus area that sweeps across all R&D programs to deliver our research findings. The array of research needs is as wide as our stakeholders' backgrounds. Our focus areas are not mutually exclusive and naturally overlap as they address diverse goals. An integrated approach

among programs will ensure that our research answers questions from as many perspectives as possible.

We will focus on the following six areas to guide our future research and development programs:

1. **Changing Ecosystems:** Productivity, Risks, and Uncertainties
2. **Conflicting Values:** Effects on Natural Resource Use and Management
3. **Wildland Fire:** Responsibilities, Risks, and Benefits
4. **Healthy Environments:** Water Quantity, Water Quality, and Clean Air
5. **Wildlife and Fish Habitats:** Restoration and Maintenance
6. **Communicating With Our Stakeholders**

Scientists installed Parshall flumes and a sediment dam in New Mexico to test the effects of spring and summer prescribed burns on oak savanna ecosystems.

1. Changing Ecosystems: Productivity, Risks, and Uncertainties

Natural and human-induced disturbances are straining the health and productivity of ecosystems in the Great Plains and Interior West. Disturbances include: invasive plants, wildfire, prescribed fire, insect and disease outbreaks, water management (drought and flooding), air pollution, global change, grazing, mining, harvesting, soil erosion, recreation, and road-building and maintenance. Changes in land use such as fragmentation of large areas by ranchettes, subdivisions, and roads are further examples of human-induced disturbances. Our research will provide knowledge on the productivity, risks, and uncertainties associated with disturbances.

Counting cheatgrass seedlings on a burned plot.

Some Relevant Questions

- **How do natural and human disturbance processes and their interactions impact and shape ecosystems?**
  - How do invasive species affect the fire cycle?
  - What methods can be developed to monitor and assess noxious weed impacts?
  - How do microbial organisms affect the environment?
  - How can recreation impacts on ecosystems be quantified and predicted?
  - How do various disturbances affect the availability of various natural resources?
  - How do fire, insects, and disease affect long-term productivity and carbon dynamics of ecosystems?
- **How can we restore and maintain the health and productivity of disturbed ecosystems?**
  - What limits restoration in an ecosystem?
  - What are the economics of sustainability and restoration?
  - How are biodiversity and sustainability related?
  - What are the effects of habitat fragmentation on biodiversity?
  - How can management capitalize on natural disturbances such as fire or use of prescribed fire to restore ecosystem dynamics?
  - What is the role of vegetation management and prescribed fire in restoring ecosystems?
  - What are effective indicators of forest and rangeland sustainability?

2. Conflicting Values: Effects on Natural Resource Use and Management

Pressure from public land users, changing and conflicting values, sustaining the economy, and more social involvement in decision-making often result in a lack of consensus on public land management. The increasing number of visitors to national forests, grasslands, parks, and other public lands in the Interior West is weakening the ability to provide quality recreation experiences without degrading the land. The mix of private ownership adjacent to and among public lands in the growing wildland-urban interface creates tension where objectives differ and actions have consequences beyond ownership boundaries. The diversity of society's values, more often than not, plays out in conflicting laws and court interpretations rather than among professional and knowledgeable land managers. The resulting "process gridlock" raises administrative cost and delays management actions on the ground. Our research will assist planners and managers to better understand social values and how to manage among conflicting values.

Some Relevant Questions

- **How do people with different backgrounds, cultures, values, and lifestyles become satisfied with their place in the landscape?**
  - What are the trade-offs and/or tensions among different management practices?
  - What are the social and economic effects of reductions in traditional products in rural communities?
  - How do we know when there is an effective consensus and conflicts are addressed or managed?
  - How do social characteristics and lifestyles influence values toward natural resources and involvement in land-use issues?
  - What stimulates willingness to change lifestyle, values, and consumption in the West?
- **How can science help relieve conflict in the land management planning process?**
  - How can adaptive management improve decision-making?
  - How can we use negotiation, conflict management, and collaboration tools to improve public trust?
  - How will the increased influence of urbanization on human values affect relationships with public land resources?
  - What protocols can be developed for gathering information on values, attitudes, and beliefs?
  - What are the effects of public policy and law on forest and grassland ecosystems?
  - How can sustainable ecosystems and economic stainability be integrated to meet the needs of people?

Barrel cactus.

3. Wildland Fire: Responsibilities, Risks, and Benefits

Fire has always been a major disturbance process shaping the development of ecosystems. National organized fire suppression began following the 1910 fires in Idaho and Montana. Catastrophic fires in the Interior West have had a major impact on national policy ever since. Our Fire Sciences Laboratory is the world's largest wildland fire research facility and will remain dedicated to studying fire behavior, wildland smoke, and the effect of fires on ecosystems. Our other research programs also address many of the questions contained in the National Fire Plan. We will conduct basic and applied research in a core fire science program aimed at providing predictive models of fire behavior and effects.

Some Relevant Questions

- How do vegetation, terrain, and weather interact to affect fire behavior?
- How do forest and rangeland fuels vary in their flammability?
- How do fire behavior and weather affect the chemistry and transport of smoke?
- How can remote sensing technologies be integrated into real-time fire management?
- How can computerized decision support systems be integrated into tactical and strategic fire operations to improve safety and effectiveness?
- How do we determine which ecosystems require postfire rehabilitation and restoration efforts?
- What level of fuels treatment is necessary to provide defensible space for firefighters and structures?
- What are the effects of harvesting and grazing on the frequency and intensity of fires in various forests and rangelands?
- How do insects and pathogens affect fuel dynamics and flammability?
- What is the impact of fuels management on fish and wildlife habitat?
- How can communities better protect their infrastructure from fire in the wildland-urban interface?
- What monitoring protocols will improve organizational effectiveness?

Fire as a natural process has been excluded from much of the landscape. We need to develop understanding and tools to safely restore fire in ecosystems.

4. Healthy Environments: Water Quantity, Water Quality, and Clean Air

Environmental legislation, such as the Clean Water and Clean Air Acts, provides strong and explicit provisions. Although regulations often focus on stable or "threshold" conditions, natural systems are dynamic. The dynamic nature of healthy environments means that variations in water quantity, temperature, sediment, fire, smoke, and other characteristics should all be expected. Human disruption and development have significantly altered these processes. All of these forces combine to challenge the predictability of water availability, water quality, and air quality. The growing human needs in urban, suburban, and rural settings drive the increasing need for clean and plentiful water and for clean air. Our research will focus on meeting these needs.

Using rainfall simulation equipment, scientists compare post-fire emergency rehabilitation treatments on the Bitterroot National Forest in Montana.

Some Relevant Questions

- **What roles do different management approaches have in achieving and maintaining healthy environments?**
  - What management options would maintain healthy environments under extreme events such as drought and flooding?
  - How can agroforestry technologies be used for treating non-point source pollution from agriculture and communities while providing amenities to the landowner?
  - How does increasing urbanization of forested areas affect air and water quality?
  - How does recreational use of watersheds and adjacent lands influence water quality?
- **What role do forests and rangelands have in maintaining clean air and clean water?**
  - What are the limits of acceptable change in air and water quality?
  - How can managers provide for livestock grazing while maintaining water quality and habitat for threatened and endangered species?
  - How is air quality changing in remote environments?
  - How can the effects of climate change be quantified?
  - How are terrestrial functions and processes linked to riparian ecosystems?
- **What options exist to simultaneously manage for clean water, clean air, and forest health?**
  - How does air quality affect water quality?
  - How does climate change influence water quality, water quantity, and air quality?
  - How can managers maintain air and water quality in the presence of fire and fuel treatments?
  - Can we predict the water demand and supply for human uses and ecological functions?
  - How much and when can water be removed before adversely affecting stream channels and aquatic and riparian life?
  - What smoke guidelines and prescriptions should be used for prescribed burns?
  - How do snow-pack and runoff affect water quality and quantity?

5. Wildlife and Fish Habitats: Restoration and Maintenance

The conflict is high as managers struggle to simultaneously conserve unique habitats for threatened, endangered, and sensitive species and handle recreation, timber management, fire, insect and disease outbreaks, expansion of noxious weeds, and other resource issues. Environmental legislation—such as the National Environmental Policy Act, the National Forest Management Act, and the Endangered Species Act—provides for the conservation of wildlife and fish habitats. Concerns over wildlife and fish conservation have hastened major policy shifts in forest and rangeland management over the past 25 years. Most appeals and litigation over management practices on public land in the Interior West involve wildlife and fish issues. We will provide land managers and policymakers with scientific information to incorporate into their decisions.

Some Relevant Questions

- How do natural disturbance processes such as fire affect habitats on different time scales and at different spatial scales?
- How do large-scale disturbances such as fires influence population resilience and persistence?
- What are the effects of ecological restoration and post-fire treatments on habitats?
- How can managers prioritize where and when management actions will be most effective at reducing risks to important habitats and species?
- How do human activities, exotic species, and ecological restoration efforts influence fish and wildlife habitats and populations?
- How do exotic species invasions affect community structure, trophic interactions, and disease dynamics?
- What factors contribute to the biological diversity and viability of fish and wildlife populations in forest landscapes?
- Can landscapes be managed to maintain a diverse mosaic of habitats and species diversity in fire-prone ecosystems?
- Can we develop a conceptual framework for more effectively addressing issues of population viability and persistence?
- What better tools and methods can we develop to inventory and monitor fish and wildlife populations?
- How can we provide a reliable knowledge base for the conservation of threatened, endangered, and sensitive species?

This migratory bull trout is equipped with an archival temperature tag. These tags provide high-resolution information on thermal habitat use by individual fish.

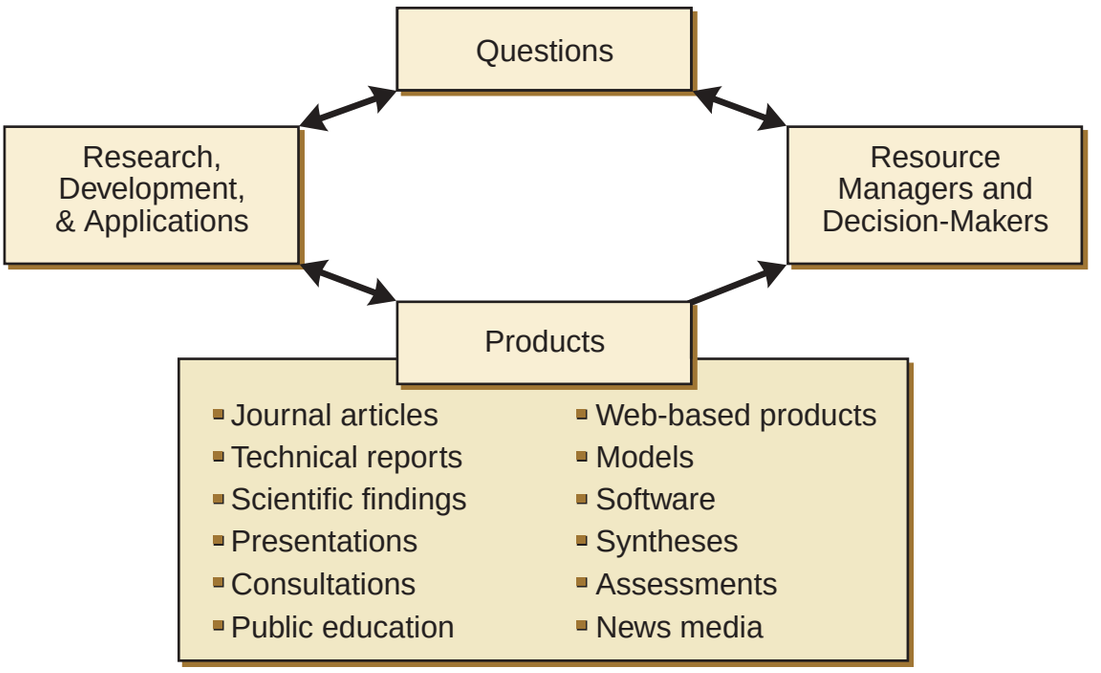
Black-tailed prairie dogs.

6. Communicating With Our Stakeholders

Credible, useable, and effective scientific information is our product. We recognize that the scientific information we produce must be packaged, promoted, and delivered so that our stakeholders can understand it and use it effectively. As we disseminate information, we will solicit feedback as to its relevance and usefulness. We will monitor the success of our focused communication efforts and adapt strategies as needed.

Our communication strategy will be to:

- Assure public confidence in the quality of our products through statistical, technical, editorial, and peer reviews of our study plans and manuscripts.
- Proactively disseminate our products by making them easy to find and readily obtainable by all stakeholders and, in particular, our Forest Service manager counterparts.
- Produce more ecosystem-based state-of-knowledge summaries and syntheses of research findings to help integrate science into natural resource management and policy.
- Build linkages between Research and land managers to ensure the implementation of science findings.
- Maintain the independence and credibility of each scientist as a neutral and objective source of scientific information providing facts, options, and consequences rather than advocating positions or recommending specific management actions.

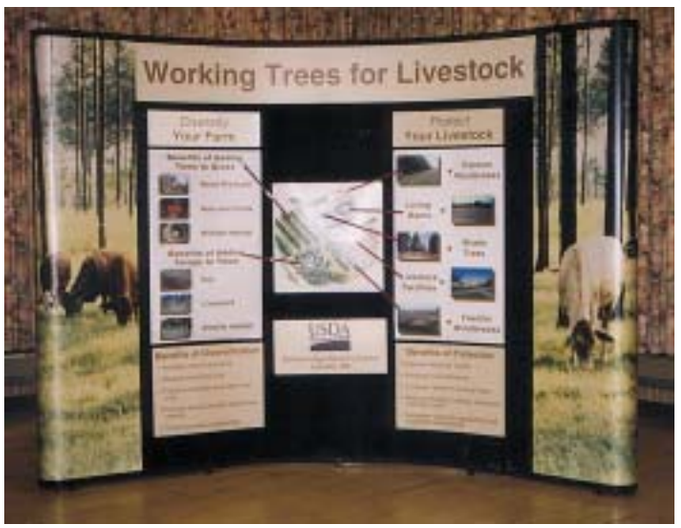


We will use a variety of media to communicate our research findings in the adaptive management process.

In developing and delivering scientific information, we will:

- Build on our existing strengths and collaborate with managers to explore new ways for transferring our science and technology.
- Educate those who use our information.
- Expand and improve our capability to electronically disseminate information to the public.
- Continue to build relationships with other Federal and State agencies, colleges, and universities to promote collaboration and capacity building in research and education.
- Strengthen our relationships with congressional staffs through regular two-way communication.
- Identify underserved communities and effectively reach out to them.
- Seek a balance among resources spent on products for managers, products for the public, and refereed journal publications for scientists.
- Make effective use of a full range of media to build a positive image locally and nationally.
- Assess the effects and outcomes of our transfer of knowledge and adjust accordingly.

Scientists use various media such as Station serial publications, journals, videos, and CDs to communicate with stakeholders.



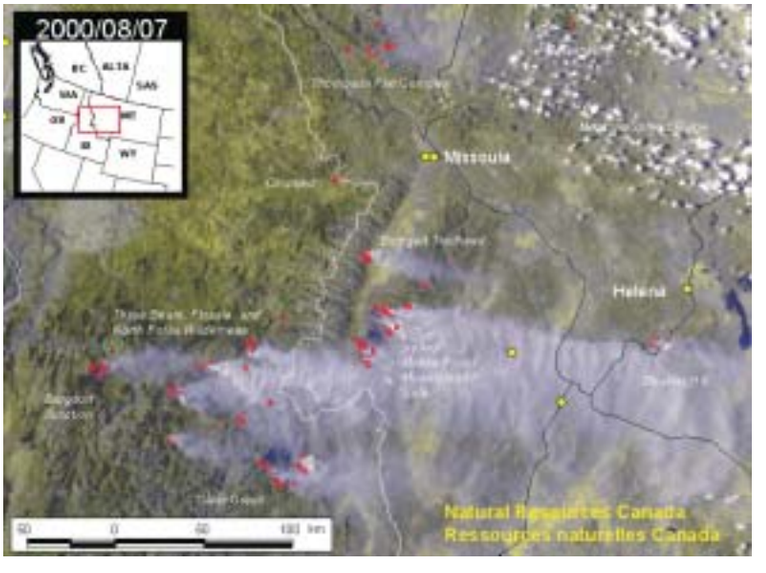
Display from the National Agroforestry Center.

Practical Applications. Natural resource managers and private landowners need a scientific foundation for making decisions. RMRS will make significant contributions by developing, testing, and providing:

- techniques for adaptive management, resource inventory, and analysis;
- criteria and indicators of sustainability;
- techniques for forest and rangeland health monitoring;
- assessments for national strategic planning;
- integrated assessments at the watershed and landscape level;
- the benefits and/or impacts of management practices;
- models predicting outcomes of disturbances such as fire, insects, and disease outbreaks;
- methods to improve the National Forest and Rangeland planning process;
- risk and trade-off analyses;
- refined communication and technology transfer tools; and
- syntheses of scientific findings.

Studies of the northern goshawk continue in Arizona.

Soil samples are collected from a wetland below a mining waste dump.



The Station's Remote Sensing Lab uses satellite infrared images to track fire and smoke.

STRATEGIC GUIDELINES

Through many group discussions at various locations, Station employees and stakeholders provided input for accomplishing our research. By emphasizing these approaches, we believe we will be more successful in achieving our goals and in appraising new opportunities.

Integrated Research

The Station will employ an integrated research approach when the scope of a problem requires interdisciplinary collaboration of scientists. Integrated research can begin with a unified, coordinated approach, or it can focus, synthesize, and/or combine disciplinary studies to achieve or reveal synergisms in complex problem solving. Experience suggests that a unified approach is often best done in the project-planning phase. Interdisciplinary research will be supported by funding coordinated and collaborative projects, reducing institutional barriers, and demonstrating the strategic agility to adapt to the needs of complex research problems.

Long-Term Research at Various Spatial Scales

Long-term studies are often the key to addressing natural resource issues. They are a unique strength within the Station. We will strengthen our commitment to specific long-term research by using and maintaining selected experimental forests, ranges, watersheds, sites, research natural areas, and data sets collected from them. We will build and maintain the necessary infrastructure and data management systems for relevant long-term studies on National Forests and Grasslands. Scientists will be recognized in panel evaluations for long-term research and awarded credit for their contributions.

The scale of a research effort depends on the organism or process being studied. Large scale, long-term studies may require a significant and/or long-term investment and collaboration. As such, the Station will maintain flexibility to conduct research at appropriate spatial scales.

The Rocky Mountain Research Station's territory covers a mosaic of biogeographic regions, from the arid desert country bordering Mexico to the boreal forests bordering Canada. An integrated research program is needed to address the diversity of issues in each region.

Balancing Outside Funding and Appropriated Base Funding

In recent years, a significant portion of the Station's funding has come from outside sources (i.e., other than Forest Service Research and Development appropriations). Scientists and administrators spend a significant amount of time developing and responding to proposals for outside funding. Most of this outside funding is for short-term, applied research and development. The challenge is to balance base funding with annually fluctuating outside funding in order to maintain the full spectrum of basic research to applied research and development. Generally, we use base funding to address research programs and problems, and outside funding to provide requested specific products. Both funding sources must support the unit's mission; however, short-term research projects and funds often will be used to leverage and complement long-term projects when it is consistent with law and policy.

Outside funding can direct scientists' energies toward inventory, monitoring, and assessments and away from research that develops the necessary protocols to implement these actions. Concurrently, outside funding helps us fill critical information gaps for natural resource managers. Untapped opportunities exist to form mutually beneficial partnerships with other research organizations. We will pursue these relationships through networking, communication of our capabilities, and strategic partnerships. The need for this type of work is so great that we must always carefully consider the balance so that planning and assessments do not dilute our primary base funded efforts. Our major focus remains on work planned through Research Work Unit Descriptions.

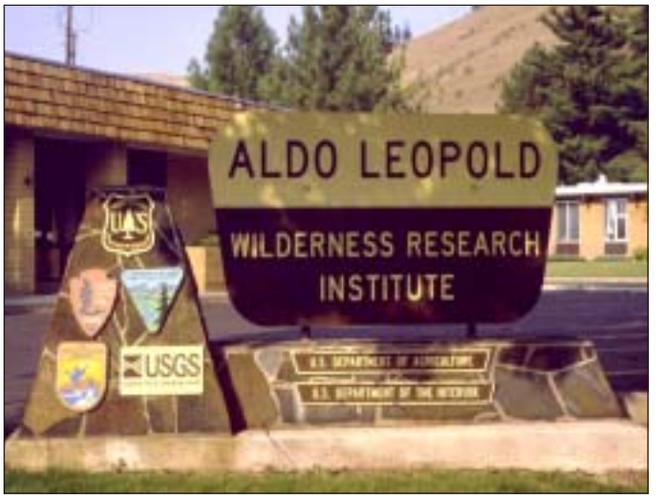
Collaboration

Collaboration across Research Work Units and with universities, other research stations, National Forest Systems Regions, and non-traditional clients

was the area of opportunity cited most frequently by Station employees. Collaboration is a mutually beneficial and well-defined relationship entered into by two or more organizations or individuals to achieve common goals. Major large-scale research projects cannot be accomplished in isolation. Funding from several sources is often required to accomplish common goals.

Through collaboration, the following opportunities will contribute to the Station's success:

- Access to expertise, equipment, and land.
- Integrated approaches to research problems with other Research Work Units and scientists at Universities and other institutions.
- Sharing of Experimental Forests, Ranges, Research Natural Areas, and other sites with other researchers.
- Engaging in research and administrative studies with our National Forest System counterparts.
- Engaging in research activities with tribal land managers.
- Further collaboration with the support units within the Forest Service, such as the Inventory & Monitoring Institute and the Forest Health Technology Enterprise Team.
- Interagency leadership from the Aldo Leopold Wilderness Research Institute in Missoula, MT, and the National Agroforestry Center in Lincoln, NE.
- Engaging in research with state organizations and other federal agencies such as BLM, NPS, USGS, and USFWS.
- Strategic alliances with organizations that have skills needed to address our mission. Examples include, but are not limited to: Sandia National Lab, NM; Los Alamos National Lab, NM; Idaho National Engineering Lab, ID; Lawrence Livermore National Lab, CA; Earth Resources Observation System Data Center, SD; National



Located on the University of Montana campus, the Aldo Leopold Wilderness Research Institute is the only federal research group dedicated to addressing wilderness research needs.

Aeronautics & Space Administration, MD; and National Oceanic & Atmospheric Administration, CO.

- Cooperative Ecosystem Study Units (CESUs). This network of inter-university and inter-agency cooperative units provides collaborative opportunities that no unit alone can address. Universities provide space, administrative support, and access to faculty, staff, graduate students, and resources. Federal agencies contribute scientists and/or other professionals located and working at CESUs under formal agreements. CESU partners share several science-based goals in the 21st century: high-quality science, usable knowledge for resource managers, responsive technical assistance, continuing education, and cost-effective research programs. A network of Cooperative Ecosystem Studies Units has been established to achieve these goals. RMRS is a member in five CESUs:
  - Rocky Mountain (hosted by University of Montana, Missoula)
  - Great Plains (hosted by University of Nebraska - Lincoln)
  - Desert Southwest (hosted by University of Arizona, Tucson)
  - Colorado Plateau (hosted by Northern Arizona University, Flagstaff)
  - Great Basin (hosted by University of Nevada - Reno)
- RMRS also supports inter-agency cooperative efforts on:
  - Fire Sciences (Joint Fire Science Plan and National Fire Plan)
  - Forest Inventory and Analysis, and Forest Health Monitoring
  - Global Climate Change

Researchers monitor weeds after a fire.

Gathering blister rust samples in Yellowstone National Park.

Our Workforce

The success of our research programs depends on the creativity and productivity of our people. The Station employs about 700 people, of which about 500 are in permanent positions. The Station will recognize and reward high-quality work and provide professional development and growth opportunities for all employees. Our employees are dedicated to providing efficient and effective research and administrative processes. We are committed to the following operating guidelines:

Topping a Douglas-fir tree at approximately 50 feet off the ground as part of the canopy fuels in conifer forests study at the Missoula laboratory.

- Maintain a dedicated workforce of scientists, research support, operations, leadership, and administration.
- Give employees ample opportunity to participate in continuing education and other training to sharpen their skills and expose them to new ideas.
- Provide opportunities for new talent and entry-level positions with career paths that result in retention of qualified scientists and support.
- Seek opportunities to improve administrative processes, remove inefficient administrative work processes, and shift such responsibilities from scientists when possible.
- Assure that our scientists receive appropriate recognition in panel evaluations for technology transfer activities.
- Reflect the diversity of disciplines needed in our workforce for interdisciplinary research and for communicating with various clients.
- Reflect the larger national workforce as much as possible, in gender, ethnic background, and physical abilities.
- Maintain our commitment to Hispanic and American Indian youth camps and 1890 Black Colleges.
- Treat each other with dignity and respect, valuing each other's perspectives and values.

Research Infrastructure and Operations

Accomplishing our research mission depends on effective and efficient infrastructure and operations. We have laboratories, experimental forests and ranges, and technical and administrative support structures that enable our scientists to conduct leading edge research and development.

We are committed to the following guidelines for infrastructure and operations:

- Make efficient use of our infrastructure by maintaining and co-locating labs with universities to create win-win situations for communication, support, and collaboration.
- Take advantage of opportunities to share facilities with the National Forest System and other federal agencies.
- Maintain and improve our physical facilities to accommodate the technology of the future.
- Acquire the most up-to-date technology and scientific equipment to support our science efforts.
- Share our library resources with other stations and agencies.
- Automate operational tasks strategically as appropriate.
- Work toward an efficient and accountable centralized accounting system.
- Provide Station-wide infrastructure to support web-based applications.
- Pursue the safest possible working environment and emphasize safety among our employees.
- Develop strong working relationships between scientists and operations/support staff through communication such as field visits with scientists and office demonstrations with operations staff.

The nation's first Forest Service research station: Fort Valley Experimental Forest, established in 1908 near Flagstaff, Arizona Territory. 1915 photo.

The Next Step

Having outlined our goals and philosophical strategy in this Framework, our next step will be to shape a plan to achieve these goals. Implementation will involve assessing and refocusing our workforce capability and capacity, the physical infrastructure to support it, and the budget to accomplish our mission.

Acknowledgments

During our strategic planning process, we occasionally referred to the strategic plans of the Pacific Northwest, North Central, Southern, and Northeast Research Stations; Atlas of the New West; *and the national* Forest Service Strategic Plan. *We adapted their wording when it articulated the same ideas we wished to express.*

We thank Lane Eskew for his significant contribution in writing and editing this document. Connie Lemos (Visual Information Specialist) created the layout and coordinated printing.

Many thanks go to the photographers for their beautiful work in this publication.

A Brief History of the Rocky Mountain Research Station

The territory of the Rocky Mountain Research Station is home to some of our nation's earliest natural resources research, dating back to 1903 when the Santa Rita Experimental Range was established by the Bureau of Plant Industry near Tucson, Arizona.

But to understand the rich history of Forest Service research in the West, we must go back to 1891 when the Forest Reserves (precursors to the National Forests) were created. At that time, little information or knowledge existed about the lands or the nature, value, or use of natural resources.

In 1908, the Forest Reserves were reorganized into National Forests and, soon, the Office of Grazing Studies was founded in Washington, D.C. From there, a series of field stations and laboratories were set up nationwide to study timber, grazing, and watershed management. These included the Fremont Experiment Station and Wagon Wheel Gap Experimental Watersheds in central Colorado, the Priest River Experimental Forest in Idaho, and the Jornada Experimental Range in southern New Mexico. These and other sites were placed under the Forest Service's Branch of Research in 1915.

As the importance and use of forest and rangeland resources increased, the Forest Service recommended the creation of a nationwide forestry research program consisting of a network of regional experiment stations. So, under the McSweeney-McNary Act of 1928, 12 stations were established. The Southwestern, Northern Rocky Mountain, Intermountain, and Rocky Mountain Forest and Range Experiment Stations oversaw Forest Service research throughout the Southwest, Great Basin, Rocky Mountains, and parts of the Great Plains. Through a series of mergers, the latest being that of the Intermountain and Rocky Mountain Stations in 1997, the four stations are now combined into the Rocky Mountain Research Station, headquartered in Fort Collins, Colorado.

– Rick Fletcher

UNITED STATES DEPARTMENT OF AGRICULTURE

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February 2003

Cover: Rocky Mountain National Park.