

USER NEEDS SUMMARY REPORT

October 7, 2003

**National Commission on Science for Sustainable Forestry (NCSSF) &
The National Forest Foundation (NFF)**

TABLE OF CONTENTS

I. User Needs Workshops Summary - “Linking Science to Practice”

- Introduction
- Findings
- Top Needs
- Major Barriers
- Other Barriers/Opportunities to improve management for biodiversity and sustainability
- User suggestions for tools and information to serve their needs
- Current and available tools and information used by decision makers
- Additional tools and information needed
- Breakout groups

II. User Needs 2003 Survey - “Biodiversity Information and Tools”

- Introduction
- Interviewees' Composite Profile
- Summary & Results
- List of Interviewees
- Survey Questionnaire

I. NCSSF-NFF User Needs Workshops Summary:

“Linking Science to Practice”

**April 22-23, 2003 – Alexandria, Virginia
September 10-11, 2003 – Missoula, Montana**

INTRODUCTION

On April 22-23, NCSE's National Commission on Science for Sustainable Forestry (NCSSF) and the National Forest Foundation (NFF) convened a workshop for 20 participants, mainly from the Eastern region, designed to improve communication and understanding between the users and producers of scientific tools and information related to sustainable forestry. A second workshop was held in Missoula, Montana on September 10-11, which brought together an additional 14 professionals in forestry-related fields, mainly from the Western region for a similar purpose. Both workshops brought forestry practitioners, managers, and policymakers together with research scientists to establish a dialogue to improve biodiversity and sustainable forestry practices, and increase the utility of scientific tools on-the-ground.

Prior to both workshops, NCSSF and NFF conducted surveys of forestry professionals in order to begin identifying their priority information needs related to biodiversity and sustainable forestry practices (see “Survey Methodology” in II. User Needs 2003 Survey”).

During the first day of the workshop, researchers from eight projects presented their preliminary results and answered questions about their work. The researchers then asked the workshop participants to respond to questions about how to make the project findings most relevant to their management, policy and practical knowledge needs. The questions for participants included what information and tools they use in making decisions and how they use that information, as well as specifics about applications and currently utilized information resources. Input was also given about how to more effectively communicate the results to communities and people working on the ground. The NCSSF projects presented for users' feedback were:

1. Define Core Biodiversity Indicators for Sustainable Forestry (John Hagan - Manomet Center)
2. Identify Biodiversity Research Needs on Forest Fragmentation (John Kupfer - U. of Arizona)
3. Synthesize the Existing Information on Biodiversity and Water (Michael Huston - ISESI)
4. Evaluate the Role of Ecosystem Restoration in Biodiversity (Robert Mitchell - Jones Center)
5. Evaluate the Needs and Requirements for Decision Support Systems (Norm Johnson - OSU)
6. Survey Lessons Learned about Managing Forests for Biodiversity and Sustainability Based on Practical Experiences (Steven Radosevich – OSU)
7. Assess the Scientific Basis for Standards/Practices at the Stand, Management Unit and Landscape Levels in the Eastern United States (T. Bently Wigley – NCASI)
8. Assess the Scientific Basis for Standards/Practices at the Stand, Management Unit and Landscape Levels in the Western United States (Tom Spies – USDA Forest Service)

The second day of workshop involved facilitated sessions where participants articulated their applications and needs for biodiversity and sustainable forestry information. There were also discussions of how to effectively communicate and transfer research results and related information to decision makers. The results of a survey (participants were among the interviewees), was discussed and elaborated upon to refine our understanding of their information requirements. In addition, NCSSF sought user input on other science-based information needs they would like the program to address.

FINDINGS

Forestry professionals at the workshops expressed a number of pressing information needs (see list of “Top Needs” below). The participants stressed the need to involve multiple stakeholders in monitoring and evaluation from the beginning. Doing so educates those community stakeholders about the research and allows them to experience hands-on application of the tool or information; researchers in turn gain vital community buy-in and participation. Better communication and coordination of research efforts and resources both within the field and in the dissemination of information was a central part of the user needs discussions. They also emphasized the importance of accessible, relevant and shared data, as well as the need for a clear working definition of biodiversity. The idea of translators or interpreters, who would be involved in the scientific process, was repeatedly suggested, but this person would be able to effectively communicate the research results into useable and understandable tools and information.

The summary of findings is listed below and reflects the users’ (workshop participants’) comments and views. Unlike the individual phone surveys conducted, the workshop provided an interactive forum for input and facilitated a dialogue between participants. Redundancies found between the User Needs Survey Report and this User Needs Workshop Summary exist because of the overlap between survey interviewees and workshop participants. Overlaps between findings in the Workshop Report categories are also prevalent because of the nature of the information needs and barriers.

I. TOP NEEDS (most frequently cited by users)

- A synthesis of biodiversity and sustainability indicators that take into consideration the dynamic nature of forest stands and resources.
- An evaluation of best management practices and their effectiveness in real world situations.
- A comprehensive inventory of the data and tools available to forestry professionals.
- Enhancing communication between producers and users of knowledge (purpose of workshop)
- Improving information, analysis and synthesis; “explain what we already know and significance.”
- Providing clear, consensual, and positive definitions of sustainability and biodiversity.
- Developing measures of success – What is conservation success? How do we know that we are achieving sustainability?
- Engaging multiple parties, local communities, non-industrial private land owners, etc.
- Keeping the message simple, synthesize information and translate into meaningful results.

II. MAJOR BARRIERS

- Polarization within society of values/perception of biodiversity (goal versus barrier).
- Lack of adequate funding for monitoring, management, training and research.
- Ineffective “marketing” of research (before and after projects). Defining who will use the research? What are the specific information needs of users?
- Need a better understanding of public perceptions and values related to biodiversity and the basis for them.

III. Other Barriers/Opportunities to improve management for biodiversity and sustainability:

- Research results should be transformed into relevant, accessible, usable information
- Need more site specific information
- Make it easier to find the “right” information and make it easier to find out what is known
- Lack of people and resources to address biodiversity and sustainability mandates
- Gauging management/conservation success (will we know it when we see it?)
- Multiple use management efforts (trying to do too much on a given piece of land)
- Perception of biodiversity as the enemy – protection of biodiversity seen as a threat to some
- Need to make biodiversity economically viable/appealing to owners and managers
- Non-industrial, private landowners lack resources and knowledge to carry out biodiversity
- Need to cater to diverse groups of users
- Involve local communities, youth, and media in data collection and information dissemination
- Bring disparate data together into meaningful reservoir – need a comprehensive database
- Comprehensiveness working against us (biodiversity is everything, how do we manage that?)
- Dueling scientists – How do non-specialists know who is right? Which theory is correct? Ongoing issue that can undermine credibility of science.

IV. User suggestions for tools and information to serve their needs

- Distill scientific knowledge into something the general public can understand
- Examples of best management practices (BMPs) working on the ground
- Define biodiversity in a way everyone can use
- Need a “Jacques Cousteau” of forestry, i.e. someone to speak to the public
- Market research – find out what is wanted first and produce only what there’s a market for
- Engage the people – anecdotal stories sell
- Need to bring issues to congressional circles
- Make biodiversity appeal to interests of non-industrial, private landowners
- Create partnerships to deliver material and information to public

V. Current and available tools and information used by decision makers

- Information on species status and trends
- Existing publications, models, technical notes
- Workshops, technical sessions
- Cost/Benefit analysis
- Surveys
- Maps/GIS
- Technical and applications publications
- Inventory data and synthesis

V. Additional tools and information needed

- Inventory system - “one-stop-shopping” for users
 - Coordinated analysis
 - Who’s doing what?
 - Synthesized data into meaningful information for users
 - Regular monitoring
 - Landscape level information
 - Fill the information gaps in space, time and forest types
- Map social & economic patterns over biodiversity & sustainability patterns (overlay)
- User friendly data and tools
- Virtual reality forests to explore and visualize consequences of management options
- Qualitative analysis of best management practices (BMPs)

VI. Breakout groups – Recommendations for future NCSSF projects & how to encourage better communication between users and producers

- Need translators/interpreters to most effectively communicate research results from researchers/producers to users/practitioners
- Need to fill incentive gaps – educate and encourage people of biodiversity considerations
- NCSSF projects can improve scientific basis for sustainable forestry, but need to communicate and implement to users - should be an integral part of funded projects
- Follow-on projects/continuation of previously funded projects should be about communicating the research results into useable tools and information
- Fund follow up projects that looks at the results of previous NCSSF projects – for example, coordinate site-specific pilot projects in various regions and determine how results can be best implemented
- Research topics must be relevant and should involve the community and various audiences at the beginning stages; encourage partnerships and multiple stakeholder involvement in the process
- Commission in unique position (cross-section of interests) to legitimize information gathered and should use that position to convene, gather and disseminate information. The Commission can play major role in depolarizing the issues

- Fund projects based on who the key constituents are, what they need and determine how to communicate information to them
- Determine where the social and economic opportunities are for forest communities in managing sustainability for biodiversity
- Fund projects that involve synthesis of monitoring methodologies and protocols
- Provide incentive on both ends (users and producers) to produce better information
- Implementation needs to have equal footing with development
- Must determine the audience, who uses or needs this information (forest managers, practitioners, public land managers), the channel (actively updated website, abstracts), and the message (applicable tools)
- Combination of a workshop and demonstrations on-the-ground is highly effective in first educating the users about the information and then showing them how the tool actually works in the field – leave information with the users/community participants from the demonstration after workshop is completed
- Publication of synthesized research in e-newsletters or paper newsletters that provides a snapshot version of the research (with links to where more detailed information can be found)
- Regional annual meetings focused on the “State of Knowledge/Science” with sessions on findings and demonstrations in the field

LIST OF WORKSHOP PARTICIPANTS

Greg Aplet*	The Wilderness Society
Mary Lee Bailey*	Ravalli County
Meadow Barr	Shasta Energy Group
Pete Barrell*	Siuslaw Watershed Council
Perry Brown*	University of Montana
Paul Carlson	Land Trust for the Little Tennessee
Nils Christoffersen*	Wallowa Resources
Anne Dahl*	Swan Ecosystem Center
Carol Daly*	Flathead Economic Policy Center
Carol Ekarius	Coalition for the Upper South Platte
Martin Goebel	Sustainable Northwest
Mark Henry*	General Dynamics Decision Systems
Ryan Houston*	Upper Deschutes Watershed Council
Eric Johnston*	USFS, Northern Region
Rebecca Lloyd*	Nez Perce Tribe Watershed, Fisheries Department
Kenny McDaniel*	Bureau of Land Management
Stan Nicholson*	Seeley Lake Forest Council
Melanie Parker*	Northwest Connections
Robb Turner	Southern Appalachian Man and the Biosphere (SAMAB) Foundation
Gary Schneider	Partners of the Cherokee National Forest
Lloyd Irland	The Irland Group
Kenny Fergusson	Huber Resources Corp.
Harry Hafer	Cradle of Forestry Interpretive Association
Peter Bates	Western Carolina University
Ajit Krishnaswamy	National Network of Forest Practitioners
James Grace	Pennsylvania Bureau of Forestry
Scott Wallenger	Mead Westvaco
Bob Simpson	American Tree Farm System
Nick Brown	NatureServe
Andrea Bedell Loucks	Pinchot Institute
Michael Goergen	Society of American Foresters
Mikki Sager	The Conservation Fund
Mike Washburn	FSC
Marc Bosch	USDA Forest Service
David Pritchard	National Hardwood Lumber Association
John McNulty	Seven Islands Land Company

NCSSF - NFF ATTENDEES

Chris Bernabo, NCSSF	Jennifer Karanian, NCSSF
Joyce Berry, Colorado State University	Alexandra Kenny, NFF
Bruce Cabarle, World Wildlife Federation	Mary Mitsos, NFF
Norm Christensen, Duke University	Dave Perry, Oregon State University
Therese Cluck, NCSSF	Bill Possiel, NFF
Doug Crandall, NFF	Hal Salwasser, Oregon State University
John Gordon, Yale University	Peter Saundry, NCSE
Sharon Haines, International Paper	Mark Schaefer, Nature Serve
Eric Holst, Doris Duke Charitable Foundation	Mark Shaffer, Defenders of Wildlife

*Missoula workshop attendee

II. USER NEEDS 2003 SURVEY: “BIODIVERSITY INFORMATION & TOOLS”

Conducted and Summarized by:

Therese Cluck – NCSSF

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TABLE OF CONTENTS

Introduction

Interviewees' Composite Profile

Summary & Results

1. Do you **consider biodiversity** in the work that you do now? If yes, how?
2. What is the **value to you** of biodiversity considerations in performing your job?
3. What laws, regulations, rules and/or management policies **do you respond to** that include consideration of biodiversity on forestlands?
4. What types of **data, indicators, approaches and tools** do you now use in addressing biodiversity and sustainable forestry?
5. What **additional** types of data, information, approaches and tools would most help you in addressing biodiversity and sustainability issues?
6. What are the **biggest obstacles** for you in addressing biodiversity and sustainable forestry challenges?
7. In your opinion, the **most important 3 things** needed to improve the scientific and technical basis for evaluating, monitoring, managing and enhancing biodiversity and sustainability are the following:
8. How are new information and tools best **communicated and transferred** to you for improved applications in your work?

Appendices

Appendix A: List of Interviewees

Appendix B: Survey Questionnaire

INTRODUCTION

Overview & Purpose: The National Commission on Science for Sustainable Forestry (NCSSF) and the National Forest Foundation (NFF) conducted a survey of forestry professionals in order to identify their priority information needs related to biodiversity and sustainable forestry practices. The survey results were used in two workshops designed to enhance the linkages between researchers and forestry practitioners, managers and policymakers. The goal was to conduct a learning dialog between those “users” that apply scientific information and tools in making decisions and the researchers that “produce” that information. The result will be improved communications, understanding and linkages between the producers and users of sustainable forestry information.

Background: NCSSF’s mission is to improve the scientific basis for sustainable forestry in the U.S. To accomplish this goal, NCSSF identifies and sponsors research, tool development, surveys and outreach activities involving leading researchers and practitioners nationwide. A major challenge is ensuring that the research is relevant to the needs of those who will use the results in designing, conducting and evaluating sustainable forestry practices. The NFF is working with NCSSF in bridging the gaps between information users and information producers by acting as a networking organization, increasing communication and outreach on every level, and the utility of scientific tools on-the-ground.

NCSSF will use the results of the survey and workshops to enhance the communication of ongoing research to practitioners at the field, management and policy levels. In addition, NCSSF is seeking users’ input on what other science-based information needs they have that the program could address in 2004 and beyond.

Survey Methodology: The interviewee selection process began with a nationwide set of over 60 leading forestry professionals roughly divided between field, management and policy level practitioners. The users interviewed included key NFF cooperators in different regions of the U.S. as well as other representatives of government, NGOs and industry. A total of 35 Eastern region people were interviewed by telephone in February, March and April 2003. The second round of interviews was done in July and August to prepare for the September workshop. The 24 interviewees included mostly Western region users. All interviews were conducted using a standardized survey instrument provided to the subjects in advance to allow them to anticipate and effectively respond to the questions (see “II. User Needs 2003 Survey”). After the first round of interviews, the survey questions were slightly modified to reduce redundancies found, which improved the efficiency of the interview. Because the survey size was relatively small, the results presented here are a qualitative summary and assessment of users’ needs, rather than a statistically representative quantitative sampling.

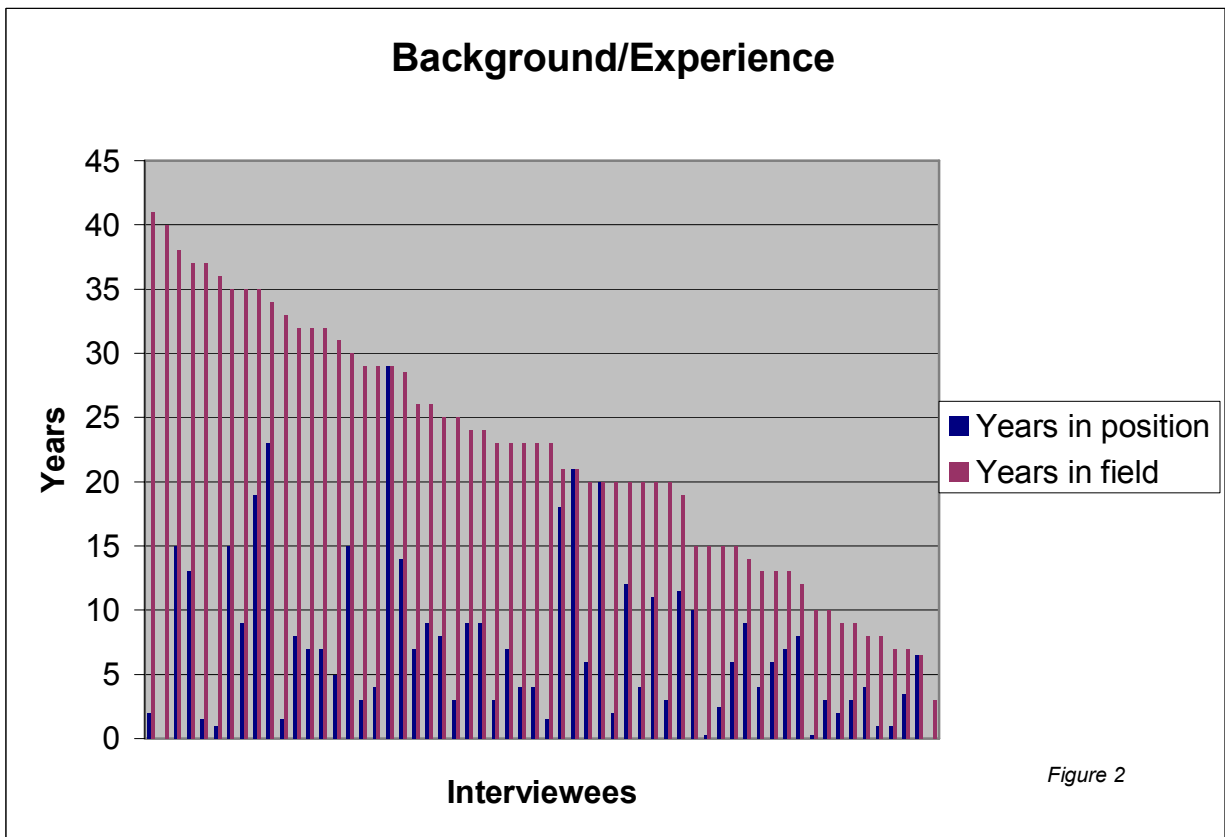
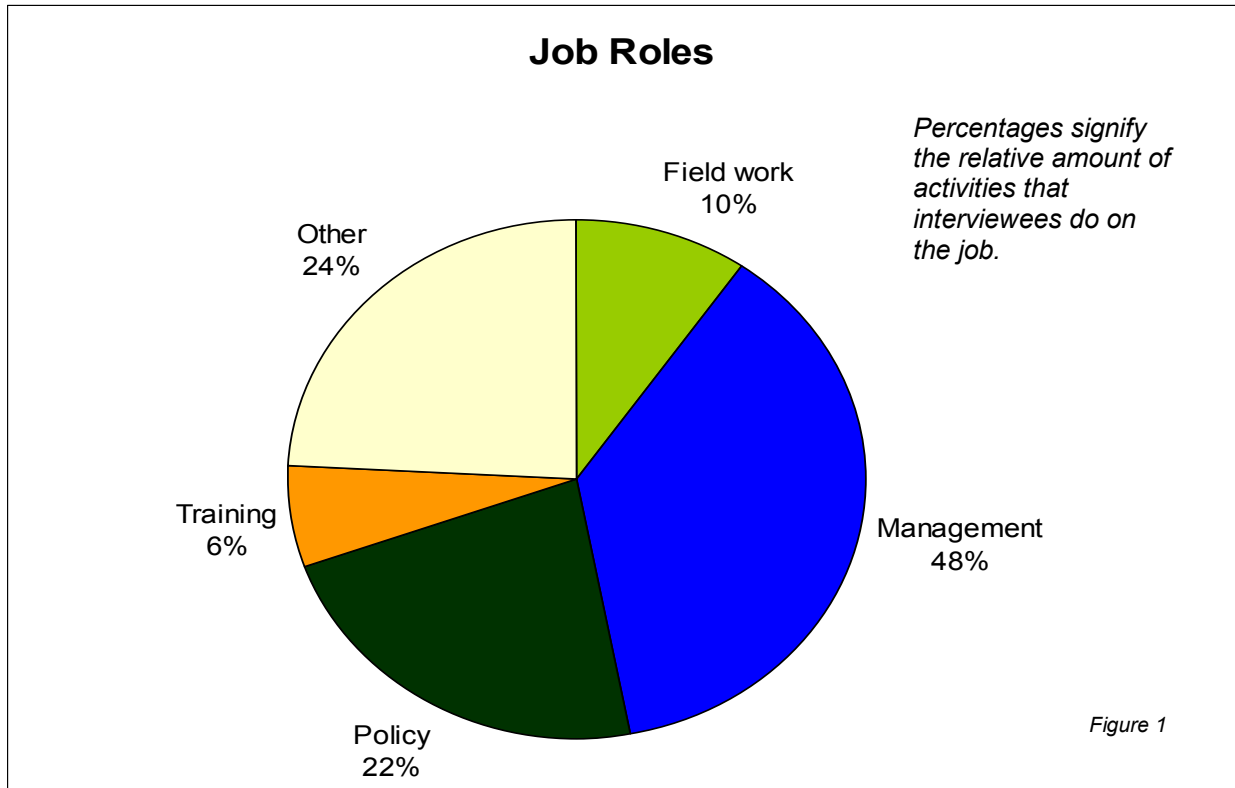
To gain a profile of the interviewees’ backgrounds, they were asked to give the relative portion of their jobs they spend in different activities, such as field work, management, and training. The surveyed individuals’ composite roles and years of experience are summarized in figures 1 and 2.

SUMMARY & RESULTS

The responses to each interview question were organized by three broad interviewee types - forest practitioner, forest manager, or forest policymaker. Answers were then sorted within each participant type into broad categories for type of response. Top responses to each question among the three user groups were compared and analyzed for commonalities and differences, where they existed.

While preferences varied by participant group, no major differences were found in the types of information, tools, data, and obstacles each identified. The importance of accessible, relevant, and shared data was emphasized by all three participant types, as was the need for more specificity in defining biodiversity. The dynamic nature of forest stands and resources, and the need to involve multiple parties in monitoring and evaluation was also identified. A concern that was brought up again and again was to need to communicate and coordinate better; both within the field, and by better educating the public about what biodiversity and sustainable forestry actually mean.

INTERVIEWEES' COMPOSITE PROFILE (Figures 1 & 2)



1. Do you consider biodiversity in the work that you do now? If yes, how?

When asked if they considered biodiversity in their work, all interviewees responded positively. Most people viewed biodiversity as a “key part” or “core principle” of their organization’s focus and mission. Biodiversity is a central component around which many based their work. A strong view mentioned was that biodiversity is a piece of the larger whole and a landscape-level approach is often taken. An example given to encourage a holistic approach was the effort to monitor changes in biodiversity and then to distribute the information to public land agencies. As a criterion of the sustainability of the area, biodiversity was cited as a true indicator of the health and integrity of the forests. However, biodiversity was pointed out as a necessary element but not the entire picture of ecosystem sustainability.

2. What is the value to you of biodiversity considerations in performing your job?*

Overall, the value of biodiversity considerations in performing their jobs was extremely important to all users interviewed. Most responded with a personal interest in biodiversity, as well as identifying biodiversity considerations as a priority to their organization / company. Many saw biodiversity as a critical piece of ecological well-being and must be integrated with social, economic, and community concerns. Legal requirements and organizational missions were also cited as a reason for the high value of biodiversity. One person responded that biodiversity was of very little value.

3. What laws, regulations, rules and/or management policies do you respond to that include consideration of biodiversity on forestlands?

- Interviewees overwhelmingly listed the Endangered Species Act and the Clean Water Act in reply to this question. Because response to these Acts is mandated through legislation, and because of their applicability to hundreds of species and waterways throughout the U.S., each participant acknowledged their influence, some directly, and others peripherally, in affecting their work.
 - The Endangered Species Act currently lists 632 endangered species (326 are plants), and 190 threatened species (78 are plants) nationwide.
 - A challenge that was identified frequently in the survey was the need to weigh the protection of a single endangered or threatened species, versus multiple other species depending on the same ecosystem.
 - Since the passage of the Clean Water Act in 1972, program focus has shifted somewhat from a program-by-program, pollutant-by-pollutant approach to a more holistic, watershed-wide approach.
- Best Management Practices – particularly at the regional, state and local levels – were mentioned by a significant number of interviewees. Unlike the ESA, Clean Water Act, National Forest Management Act, and National Environmental Policy Act, BMP’s are voluntary and can be applied in a local, small-scale context.
- Several of the unlisted laws, regulations, rules and/or management policies that interviewees mentioned, dealt with public lands (FLPMA, FS and BLM regulations) or aquatic health (Wild and Scenic Rivers Act, streamside zoning laws, and wetland-focused regulations).

- Field practitioners and forest policymakers responded overwhelmingly more to federal laws and regulations, while forest managers responded more to state laws and regulations.
- **Other laws, regulations, rules and/or management policies mentioned by users:**

Federal:

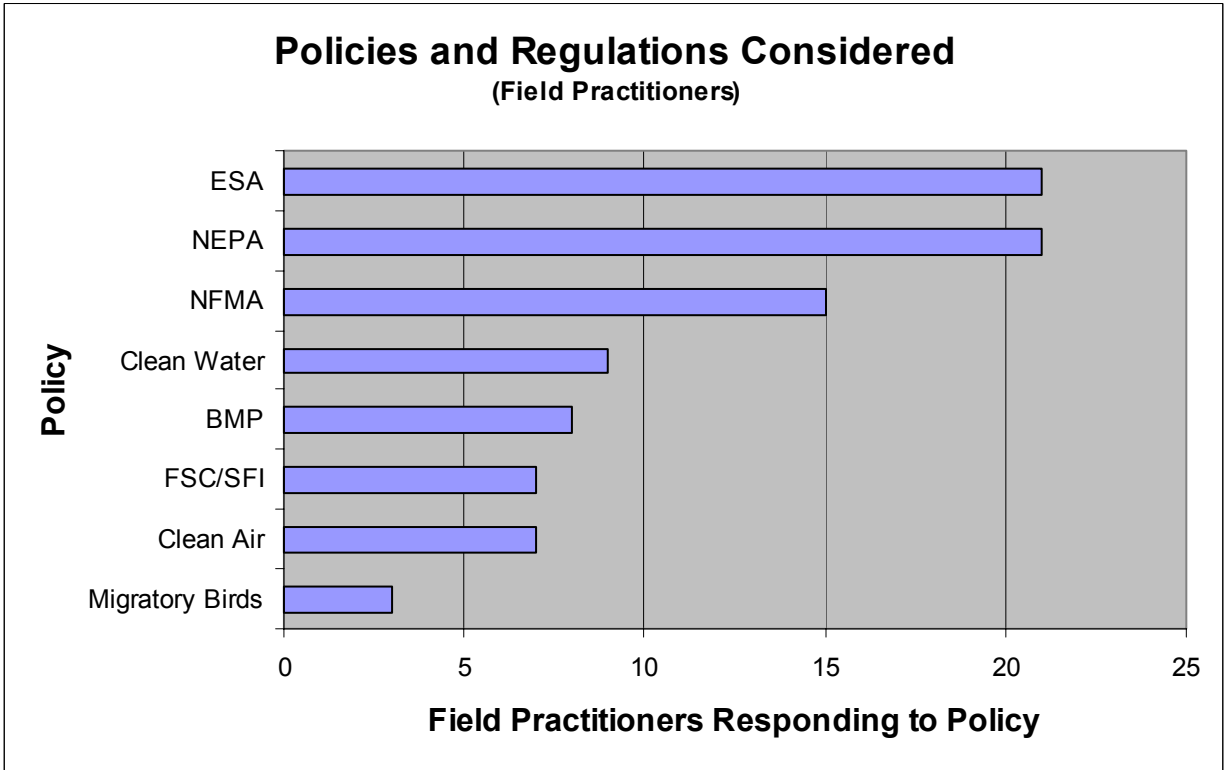
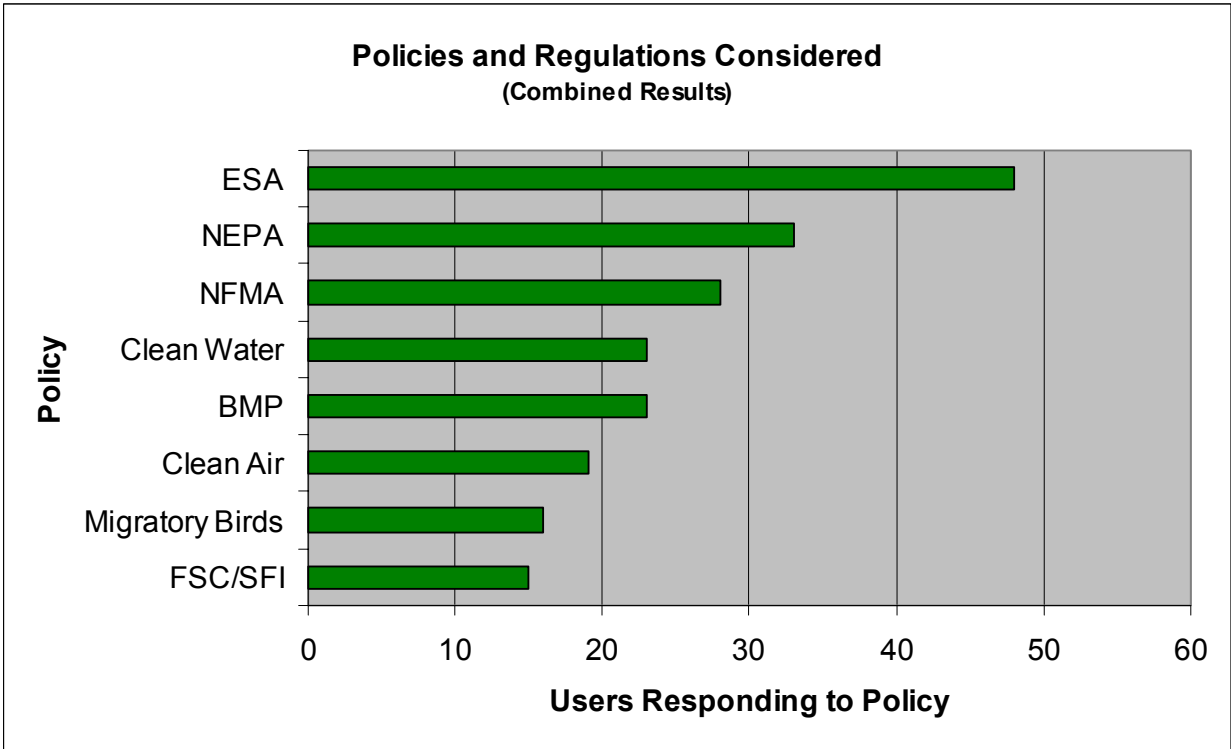
- FLPMA
- Wild and Scenic Rivers Act
- Principles/Laws of National Forest Management
- Wetland-focused regulations and management policies
- Mining Act
- Sustained yield laws
- National Historic Preservation Act
- Wilderness Act
- Antiquities Act
- Forest Service and Bureau of Land Management Regulations (categorical exclusions to NEPA, '92 appeals reform act changes)
- Implementation regulations
- Stewardship contracting authority (Forest Service & BLM)

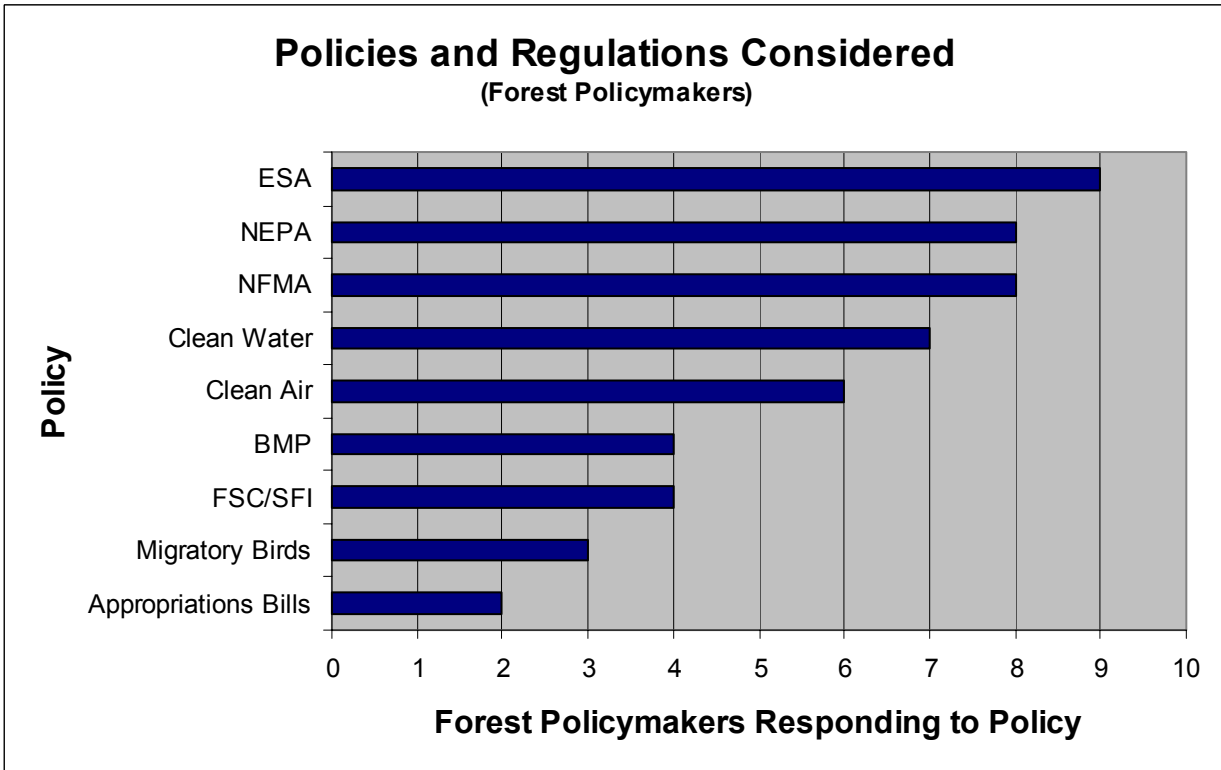
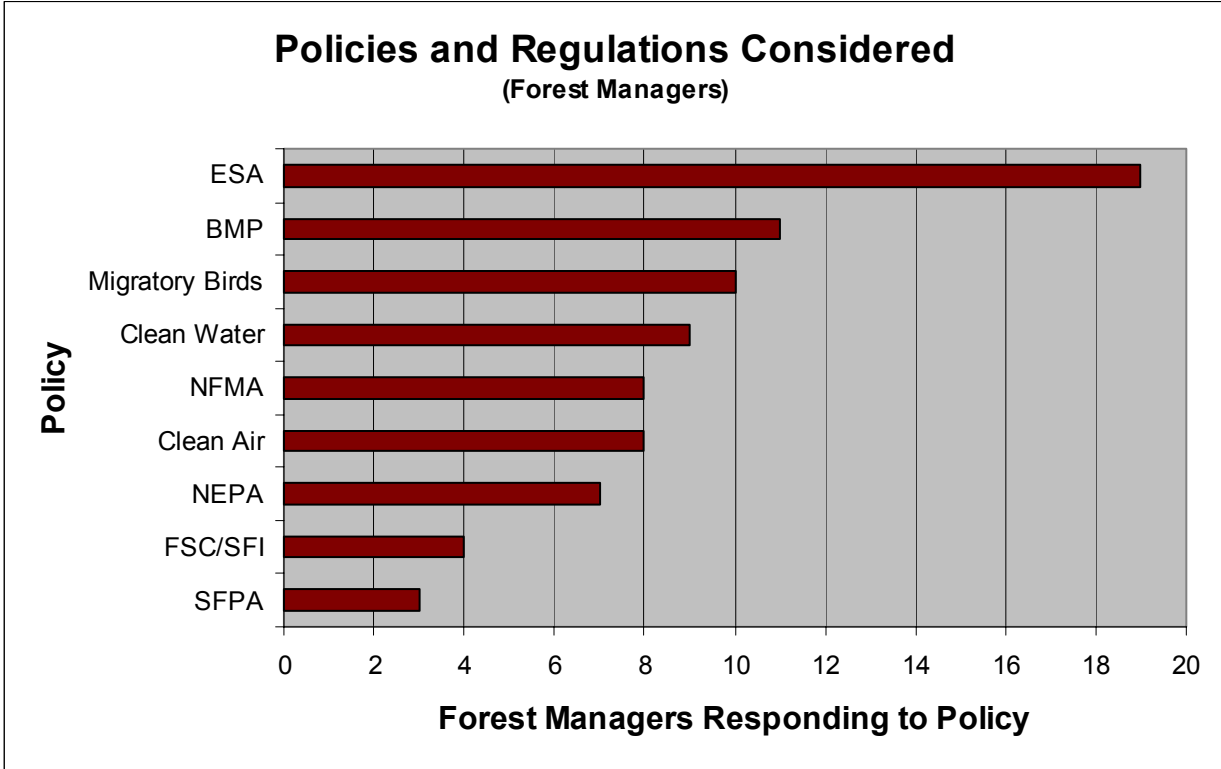
Regional:

- Northwest Forest Management Plan

State:

- Montana Environmental Policy Act
- Montana Streamside Zoning Laws
- Idaho Forest Practices Act
- Sensitive Species Act
- Montana Constitution
- Best Management Practices (at the state level)
- State Forest Practices Act





4. What types of data, indicators, approaches, and tools do you now use in addressing biodiversity and sustainable forestry?

- All three user groups' responses are interrelated, particularly because much of the data that is most heavily relied upon habitat fragmentation, or the overarching Montreal Process Criteria and Indicators, for example, use both catalogued research and on-the-ground observation (combined measures).
- All three participant types responded that habitat fragmentation was a key indicator of biodiversity and sustainability. Presence or absence of key indicator species, (most commonly referred to by forest policymakers), as well as their association with one another, is implicit to the study of how different types of habitat are changing or diminishing over time.
- Forest policymakers overwhelmingly responded that they look to the Forest Stewardship Council and Sustainable Forestry Initiative for guidance as to how to measure biodiversity and sustainability. In general, more managers and policymakers mentioned FSC and SCI guidelines more frequently than did practitioners.
- As a group, field practitioners looked at monitoring and fuels reduction and treatment more closely than the other participants, while more of the forest managers looked to State Heritage Program databases to augment their work. This suggests a differential in the type of data looked at - on-the-ground observation and follow-up versus a combined catalogue of previously collected information.
- Regardless of whether participants were field practitioners, forest managers, or policymakers, however, four broad types of current information were identified as of being of highest use:
 - **Synthesized and Highly Accessible Data**
 - **Dynamic Approaches and Predictive Tools**
 - **Small-scale and site specific information**
 - **Collaborative Assessments**

The types of data, indicators, approaches, and tools used by the interviewees covered a broad spectrum. Many of these types of information are meant to overlap in order to form a more comprehensive overall picture. Responses are broken down into the four categories and the most common examples are given for each.

- **DATA**

- Gathered information: species habitat, population trends, ages of trees, forest inventories (vegetative cover, habitat types), industrial timber data (timber health, status, age class)
- GIS and field data
- Government sources: Forest Service data, Montana Fish & Wildlife Service data, State Natural Heritage Program databases
- Local anecdotal knowledge and qualitative data

- **INDICATORS**

- Sustainability indicators
- Habitat suitable for wildlife, wildlife presence
- Species distribution, composition, number, and association
- Fuel levels as potential hazards as maintenance of biodiversity
- Presence/absence of threatened and endangered species
- Insect and disease conditions and infestations

- Forest, water, air, wildlife health
 - Conditions on the ground
 - Keystone species – look at health of those populations and indicators
 - Habitat fragmentation
- **APPROACHES**
 - Communication, collaboration, and partnerships between diverse stakeholders; community outreach and education
 - Using local knowledge, oral histories, and personal observations and experiences
 - “Big picture” assessments prior to the planning process
 - Forest Stewardship training programs
 - Extensive monitoring programs
 - Predictive models (related to fire and water quality)
 - Written policy to promote wildlife habitat diversity, etc.
 - Preserving land that has scenic value
 - FSC/SFI principles and criteria
- **TOOLS**
 - Remote sensing
 - NFMA viability assessments
 - GIS
 - Landscape-level and forest level analysis, mapping, and ratios
 - Long-term watershed monitoring for indicator species
 - Stream surveys
 - Surveys of wildlife populations, water quality, and species composition across various strata
 - Hazardous fuels reduction and treatments, scoping and assessing documents, and post-fire adaptation in multiple species

5. What additional types of data, information, approaches and tools would most help you in addressing biodiversity and sustainability issues?*

- A diverse array of additional types of data, information, approaches and tools were identified by participants from each group; many of these types of information are meant to overlap in order to form a more comprehensive overall picture. Regardless of whether participants were field practitioners, forest managers, or policymakers, however, three broad types of additional information were identified as of being of highest potential use:
 - **Synthesized and highly accessible data**
 - The need to correlate different types of data in an accessible way, for a “one-stop shop” type of database, was the top concern for a majority of survey respondents overall
 - Both forest managers and forest policymakers more commonly mentioned this need than did field practitioners
 - “More common ecological classification systems to improve comparability and understanding (to avoid duplication of efforts)”
 - “Consistent multi-agency interrelated and highly accessible databases.”

- **Collaborative assessments**
 - The need to involve all parties in monitoring and assessments was a major concern for most respondents, however, it was far more frequently mentioned by field practitioners than other types of participants
 - “Include indigenous knowledge and recognize its worth”
 - “More collaborative approach to make long-term predictions using all the information we have and less time on legislative process”

 - **Small-scale and site-specific information**
 - More specific data and information on particular sites, especially those of significant value, was identified by a majority of all survey respondents
 - The mention of case studies, more precise site information, and micro-level analysis was most often mentioned in conjunction with the need for larger-scale analysis or collaborative work, making it important in the context of other broader types of data, information, tools and approaches
 - “Better small-scale research on distribution of species and mixed-habitat ranges”
 - “Analysis at the micro-level: what impact does one step have on the forest floor?”

 - **Dynamic approaches and predictive tools**
 - Several participants identified the need to look at how forests are changing, and what impact various forest management alternatives (including no-action) would have on such a dynamic system
 - In general, both field practitioners and forest managers mentioned the need for predictive models and flexible approaches, while forest policymakers tended to mention improved scientific tools instead
 - “Virtual forest models that could simulate different management alternatives over time”
 - “Models of relationships or responses of species to forest management.”
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6. What are the biggest obstacles for you in addressing biodiversity and sustainable forestry challenges?

- **Lack of Data and Information**
 - The need for up-to-date, accessible, and consistent biodiversity and sustainability information was the #1 response overall, with the vast majority of interviewees identifying it as a primary barrier
 - Many of those interviewed specifically mentioned the need for a consistent, commonly agreed-upon definition for both biodiversity and sustainability. Dependent on point of view, these terms can contain multiple meanings and encompass considerable variability in terms of scope
 - The challenge of integrating data and information from small-scale sites, with broader landscape-level analysis was commonly mentioned as well. Even if good data is available from site to site, it is difficult to see the “bigger picture” unless they can be interrelated on a larger scale
 - Many interviewees said that some of their biggest obstacles were temporal in nature – i.e., the need for more extensive long-term monitoring

- “Fostering of biodiversity does not happen overnight and requires long-term commitment”
 - “Time – it’s hard to make extrapolations from a short period of time because you don’t know the real impact”
 - The top concern for the majority of respondents overall (particularly forest managers and field practitioners)
 - Relevant, up-to-date, and landscape-level biodiversity data are lacking
 - No acceptable measure or agreed-upon definition of biodiversity
 - Little data on the combined threats to biodiversity and sustainable forestry, and how these threats interrelate
 - “There are as many interpretations of the data as there are scientists”
- **Lack of Organizational Capacity**
 - The call for greater organizational and financial capability within the field was the second most common type of response overall
 - Some interviewees mentioned the length and complexity of the planning process –
 - “Planning is analysis paralysis”
 - “Agencies do all their plans/documents to ‘bulletproof’ themselves, which is costly and forestalls problems in an inefficient way”
 - Another commonly mentioned issue was a broader institutional resistance to change
 - The lack of financial resources and staff within the field was mentioned by a significant number of interviewees. Many of these incorporated the need to direct more funding to long-term monitoring, research, and questions. Finding funding for short-term implementation of projects was mentioned as much easier.
- **Social and Political Issues**
 - The majority of interviewees identified social and political aspects of addressing biodiversity and sustainability challenges, and it was the #3 concern overall
 - Politically, socially and culturally, difficulties may arise from divergent sets of values in terms of favorable environmental outcomes
 - The social tendency has been to go to “extremes” and use emotion rather than scientific knowledge when making management decisions
 - Many interviewees specifically mentioned overuse and abuse of litigation as a major obstruction to implementation of programs, policy, and projects on the ground
 - Most commonly identified by field practitioners as a top concern
 - General lack of public understanding and education regarding appropriate forest management – old growth, role of natural disturbance, what sustainability actually means, etc.
 - “Public awareness problem: biodiversity is expert-driven and should be more people-oriented”
 - Overlaps with concerns about the lack of data and information

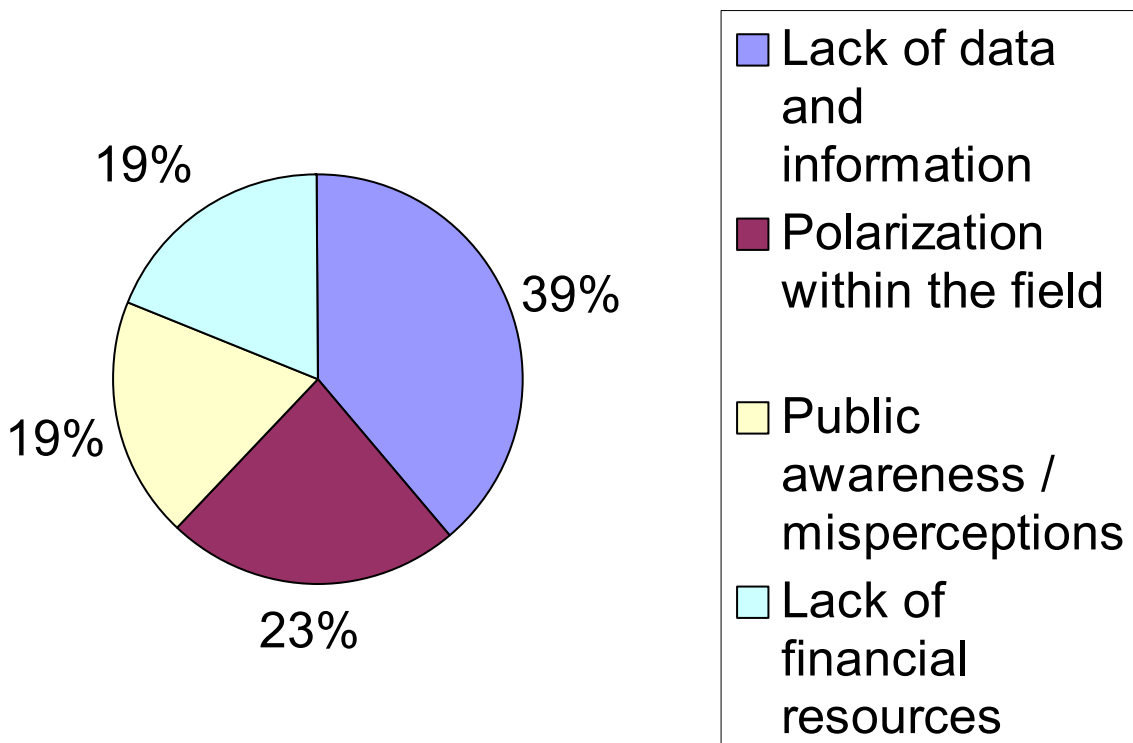
- **Lack of Communication within the Field**

- Difficulties in communicating and collaborating within the field was the fourth most commonly mentioned type of concern overall
- Several interviewees from different perspectives – practitioners, managers, policymakers, and agency personnel- identified differing objectives and paradigms as a major obstacle, leading to diverse objectives and anticipated outcomes as well
- Little cross-communication between agencies, NGO's and scientists was also seen as a major obstacle – one hand not knowing what the other is doing
- “Multiple ownerships across the landscape”
- “Dueling scientists – whose science is the ‘right’ science?”
- A top concern for forest policymakers, and the second most commonly identified obstacle overall
- “Coordination between agencies, nonprofits, industry, scientists, etc. is very limited”
- Social and economic considerations, and how they factor into concerns about sustainable forestry and biodiversity challenges, are too often overlooked
- “4.4 billion landowners have 4.4 billion different perspectives”
- Lack of consensus between agencies, nonprofits, landowners, etc. on what constitutes biodiversity and what takes precedence for protection

- **Lack of financial resources**

- Most commonly identified by forest policymakers and forest managers as a top concern
- Field practitioners did not identify the lack of funds as a major obstacle as often as the other two types of participants
- Lack of economic opportunities for forest products, particularly harvested small-diameter wood
- Few opportunities available for rural communities with high natural resource value but limited economic prospects
- “Diminished markets for products (competition with other countries, consolidation of states)”
- “Lack of resources, e.g. funds, people, time.”

Biggest Obstacles



7. In your opinion, the 3 most important things needed to improve the scientific and technical basis for evaluating, monitoring, managing and enhancing biodiversity and sustainability are the following:

- All three participant groups referred to the importance of accessible, relevant and shared data, and it was the #1 type of response overall. Forest managers mentioned the need for data and information far more frequently than practitioners and policymakers.
- **Definitions & Understanding**
 - Lack of generally accepted definition of biodiversity and sustainable forestry
 - Need a consensus on standard definitions and terms, objectives and goals
 - Clear articulation of what IS to be sustained
 - Need a good definition of what we really need
 - Better education throughout the field to determine what our true objectives should be
 - Data sharing, dissemination and synthesis

- **Communication & Collaboration**
 - More collaboration among groups
 - Multi-party participation and monitoring; involve diverse participants in monitoring and evaluation of key sites
 - Collaborative cost-benefit analysis
 - Better coordinated research programs between public and private groups
 - More use of indigenous & local knowledge – give this kind of knowledge more status
 - Translate science into something meaningful on-the-ground by making it more user-friendly and increasing sharing of data
 - Bring diverse stakeholders together for meaningful, community-wide, landscape-wide change
 - Researchers must ask what communities actually need and want
 - Enhanced public communications
 - Develop a synthesis and communication of knowledge to promote common understanding across various sectors of society

 - **Data & Information**
 - Up-to-date monitoring data and tools; current data
 - Baseline data (when we are trying to do restoration, what are we trying to restore to?)
 - Consistent and continuing monitoring
 - Site-specific tools & information
 - Need more readily-accessible information – communities must be able to access scientific data
 - Accurate data on land condition and forest structure
 - Comprehensive, consistent, and conferrable data

 - **Models, Methodologies, & Management Plans**
 - institutionalizing an adaptive management system where real data is collected to find cause and effect
 - Well-designed and implemented management plans
 - Establish long-term monitoring protocols
 - Spatially explicit models of population viability
 - Methodologies for linking research with on-the-ground planning and activities
 - Adaptive management plans

 - **Funding**
 - Increased funding, especially for long-term monitoring and evaluation in addition to project implementation
 - Funding for public research
 - Budget for long-term monitoring
 - Focus on cost-effectiveness of programs and projects
-

8. How are new information and tools best communicated and transferred to you for improved applications in your work?

- The major ways in which interviewees felt that new tools and information were best communicated to them, in order to improve applicability in their work were:
 - **Scientific journals, publications & “paper” newsletters**
 - **Workshops / seminars / conferences / symposia**
 - **Hands-on application and field study**
 - **E-mail / E-newsletters**
 - **Websites / Internet / web-based data pools**
- Scientific publications, white papers, and fact sheets that presented summaries and/or abstracts of their most relevant findings, were identified by a majority of interviewees as most useful
- “Face-time” – at workshops, trainings, and in field demonstrations – was also seen as especially useful:
 - “Direct interaction with scientists on-the-ground is invaluable – you must have this, otherwise information is lost in the translation”
- Web-based data pools and clearinghouse information; coordination between multiple organizations and agencies; conferences and symposia, and e-newsletters were also frequently mentioned
- Several survey participants also mentioned that use of a combination of different methods – for example, written format to get initial attention, followed up by a formal presentation

APPENDIX A

LIST OF INTERVIEWEES

FIELD PRACTITIONERS

Meadow Barr	Shasta Energy Group
Pete Barrell*	Siuslaw Watershed Council
Peter Bates	Western Carolina University
Paul Carlson	Land Trust for Little Tennessee
Mary Chapman*	Forest Stewards Guild
Nils Christoffersen	Wallowa Resources
Anne Dahl*	Swan Ecosystem Center
Dan Dessecker	Ruffed Grouse Society
Carol Ekarius	Coalition for the Upper South Platte
Kenny Fergusson	Huber Resources Corp.
Martin Goebel	Sustainable Northwest
Harry Hafer	Cradle of Forestry Interpretive Association
Ryan Houston*	Upper Deschutes Watershed Council
Lloyd Irland	The Irland Group
Lynn Jungwirth*	Watershed Research and Training Center
Ajit Krishnaswamy	National Network of Forest Practitioners
Rebecca Lloyd*	Nez Perce Tribe Watershed / Fisheries Dept.
Mark Lorenzo	National Wildlife Federation- Vermont office
Laura McCarthy	The Forest Trust
Stan Nicholson*	Seeley Lake Forest Council
Melanie Parker*	Northwest Connections
Craig Savage*	Priest River Group
Gary Schneider	Partners of the Cherokee National Forest
Jack Shipley*	Applegate Partnership
Tom Toman*	Rocky Mountain Elk Foundation
Robb Turner	Southern Appalachian Man and the Biosphere (SAMAB)

FOREST MANAGEMENT

J. Fred Allen (GA)	Georgia Forestry Commission
Mary Lee Bailey*	Ravalli County
Nick Brown	NatureServe
Perry Brown*	University of Montana
Chip Collins	Forestlands Group
Pete Farnum	Weyerhaeuser
Paul D. Frey (LA)	LA Office of Forestry
James Grace (PA)	Pennsylvania Bureau of Forestry
Patrick Heffernan*	Liz Claiborne & Art Ottenberg Foundation
Liz Higgins*	USFS District Ranger Stevensville, Bitterroot National Forest
James Hubbard*	Colorado State Forest Service
Eric Johnston*	USFS Northern Region Ecosystem Assessment
Dave Leatherman	Colorado State Forest Service
Keith Olson*	Montana Logging Association
David Pritchard	National Hardware Lumber Association
Gerry Rose (MI)	National Association of State Foresters
Keith Ross	New England Forestry Foundation
Gordy Sanders*	Pyramid Mountain Lumber Company
Ed Shepard	Bureau of Land Management
Bob Simpson	American Tree Farm System
Peter Van Sickle*	Montana DNRC
Scott Wallenger	Mead West Vaco

**Denotes second-round interviewee*

FOREST POLICY

Greg Aplet*
Bill Banzhaf*
Carol Daly*
Tom France*
Michael Goergen
Chet Joy
Andrea Bedell Loucks
Kenny McDaniel*
Charles Niebling
Tom Partin*
Mikki Sager
Tom Thompson
Mike Washburn

The Wilderness Society
Sustainable Forestry Board
Flathead Economic Policy Center
National Wildlife Federation, Northern Rockies
Society of American Foresters
GAO
Pinchot Institute
Bureau of Land Management
Society for the Protection of New Hampshire's Forests
American Forest Resource Council
The Conservation Fund
USDA Forest Service
Forest Stewardship Council

**Denotes second-round interviewee*

APPENDIX B

SURVEY QUESTIONNAIRE

National Commission on Science for Sustainable Forestry User Needs Survey: Biodiversity Information and Tools

BACKGROUND

Years in current position _____ Years working in this field _____
Job Roles: Field Work ___% Management ___% Policy ___% Training ___%
Other (specify) _____ %

Educational Background: (forester, economist, etc.)

1. Do you **consider biodiversity** in the work that you do now? If yes, how?*

1. What laws, regulations, rules and/or management policies **do you respond to** that include consideration of biodiversity on forestlands?

___ Endangered Species Act ___ Clean Water Act
___ National Environmental Policy Act ___ FSC/SFI Principles & Guidelines
___ National Forest Management Act ___ Best Management Practices
___ Clean Air Act ___ Migratory Birds Act
___ Others (specify) _____

2. What **measures and indicators** of biodiversity would or do you use? **

3. What is the **value to you** of biodiversity considerations in performing your job? ***

4. What are the **biggest obstacles** for you in addressing biodiversity and sustainable forestry challenges?

5. What **current** types of data, information, approaches and tools do you now use in addressing biodiversity and sustainable forestry? **

6. What **additional** types of data, information, approaches and tools would most help you in addressing biodiversity and sustainability issues? ***

7. How are new information and tools best **communicated and transferred** to you for improved applications in your work?

8. In your opinion, the **3 most important 3 things** needed to improve the scientific and technical basis for evaluating, monitoring, managing and enhancing biodiversity and sustainability are the following:

What else would you like to share with us about how to improve the scientific and technical basis for biodiversity and sustainable forestry?

*Used in second round of survey

** Questions combined in second round of survey

*** Used only in first round of survey