Sustainable Forest Management For the Western States

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Skagit County, Washington

Photo by Jenny Hinderman

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Executive Summary

A healthy forest can provide resources in the form of merchantable timber, jobs, clean air and water, wildlife, spiritual renewal, recreational opportunities, and biomass, which benefit people. The importance of sustainability is to create a balance between using natural resources for the benefit of human communities today, and ensuring for their use and enjoyment in the future.

In the WGA Assessment and Management of Western Forests - Policy Resolution 10-8, the Western Governors expressed concern over the sustainability of Western forests and called for recommendations for a common set of indicators of environmentally, economically and socially sustainable forest management. Under a contract with the WGA, Renner Associates and Washburn Consultants assessed sustainability studies and criteria and indicator frameworks (C&I) currently used in the United States, and are presenting initial recommendations for developing a Western model framework.

The field of forest sustainability studies has developed over the past 15 years. Sustainability studies assess current forest health and productivity with an eye to ensuring future forest health and productivity. The Montreal Process Criteria and Indicators (MPCI) is the internationally accepted format for a sustainability assessment, consisting of seven criteria and 67 indicators. This framework is recommended for use at the national level in countries with temperate and boreal forests. The United States is a participant in the Montreal Process and through the State Department and USDA Forest Service has been a champion for the MPCI framework in international forums.

There have been several attempts to employ the complete MPCI framework at the state and regional level. Recently, frameworks have been developed that successfully cover all seven criteria using only 18 or 19 of the original 67 indicators. The USDA Forest Service, Northeastern Area and Oregon Board of Forestry both developed smaller frameworks, which are useful tools for assessing sustainability. These two frameworks share many commonalities including: a balanced look at environmental, social and economic attributes, carefully selected indicators and metrics for each criterion, a reporting interval of five years, and grounding in the international protocol.

This report provides background and resources for the Western Governors to consider the MPCI and related studies when:

- Developing a collaborative process for determining recommendations for a common set of indicators of environmentally, economically and socially sustainable forest management for the Western States;

- Examining existing model frameworks for the assessment of forest sustainability that have been developed by groups with several years of experience, and tested by statewide or large regional studies.

The C&I format was used by many states to prepare their 2010 State Forest Assessments. They found that using the C&I framework forms an excellent pool of information to be included in state forest assessments, as required by the Food, Conservation and Energy Act of 2008 (2008 Farm Bill). When an entire region uses a common C&I framework to conduct the forest resource assessments at the state level, it improves the ability to view trends across state lines and to create strategies at the regional level. The anticipated five-year cycle of state forest resource assessments is also compatible with the time frame recommended for reviewing C&I assessments.

Sustainability studies are useful tools because they take a holistic, systems approach to looking at the health of forests. They do not look at ecological forest health in isolation, but consider it in terms of the economic and social health of the local communities, and of the state as a whole.

In C&I studies, the criteria are goal statements and the indicators measure proximity to those goals. A good indicator shows a trend, whether a good trend or a bad trend, related to sustainability. Metrics are specific measurements or data sources, which give reliable information relative to the indicators.

This document provides a starting point for developing a Western model for C&I, but it does not go so far as to recommend the specific indicators to be included in the framework.

Recommendations

1. *It is recommended that a collaborative process be developed involving stakeholders at the state and regional level for selecting the criteria and indicators. A representative group of stakeholders will include public and private forest landowners, state and federal forestry and wildlife agencies, environmental groups, sportsmen's groups, tribes and cultural heritage organizations, and other interested parties. This regional group would identify recommended indicators and metrics to support the indicators, using common data sets, state processes and state data.*

2. *It is recommended that the Western Region support inventory, monitoring and assessment programs and request assistance from the Departments of Agriculture and Interior for high level, regional coordination and data management. This will include compiling and assessing information on C&I from within all branches of the U.S. Forest Service and other agencies for periodic, area-wide reports on forest health and sustainability.*

3. *It is recommended that the Northeastern Area's framework (18) and the Oregon (19) framework be considered for their applicability to a Western model for C&I because of their success in use at both the state and regional levels.*

4. *It is recommended that the states incorporate stakeholder discussions focusing on available metrics as a key element of the sustainability study.*

Introduction

We value our forests as a natural resource, which can provide goods, employment, recreation, and a spiritual resource for people now, and for generations into the future. But we need to think about the sustainability of our forests resources today, to be sure that they will be healthy and vital for a long time to come. That is the purpose of sustainability assessments and the Montreal Process Criteria and Indicators (MPCI), an internationally accepted framework for assessing forest health and sustainability, which integrates environmental, economic and social attributes of forests in relation to human communities. The Montreal Process was developed after the 1992 Earth Summit in Brazil. (Appendix B shows the history of the development of the MPCI, adoption by the US Government, and the national Roundtable on Sustainable Forests' timeline. Appendix C contains the full MPCI framework).

In the past eight years there has been a lot of work done to scale-down the original MPCI to a smaller framework that is applicable at the state and regional levels. By employing a reduced set of indicators of forest environmental, economic and social health, many states have found that they can point to trends for sustainability or unsustainability in the relationship of their forests to people. Ideally, this will give them the opportunity to make decisions regarding forest management that will improve the health and sustainability of the forests.

Western Governors' Directive

The Western Governors recognize the interdependence of human communities and our forests, ecologically, economically and socially. In recent years, forests are increasingly threatened by invasive species, insects and diseases, fragmentation, development and wildfire. The economies of nearby local communities have been adversely affected by these threats. The impacts to our forests and forest communities have led some people to ask if our forests are sustainable. In the WGA Policy Resolution 10-8 *Assessment and Management of Western Forests*, the Governors strongly believe that forests enrich communities and individuals by providing services such as clean and abundant water, clean air, wood, fiber, wildlife habitat, access to recreation and spiritual renewal, employment and energy self-sufficiency through biomass utilization. Forest health depends on the dynamic diversity of plants and animals, including humans, to perpetually maintain resilience. Sustainable forest health is a collaborative interdependent effort between our ecosystems and society. (Appendix A shows the full text of Policy Resolution 10-8).

In the Policy Resolution the Governors direct:

- The WGA Forest Health Advisory Committee will propose recommendations for a common set of indicators of environmentally, economically and socially sustainable forest management for the Western States. This set of indicators will draw upon the globally endorsed Montreal Process Criteria and Indicators and subsequent national reports that define criteria and indicators for sustainable forest management.

- WGA will serve as a catalyst and leader to ensure that a national forest policy review and discussion results in tangible improvements to the nation's forest resource, which includes adaptive management practices.

- WGA will promote the management and monitoring of forest stands and landscapes that ensures diversity and resilience.

The Sustainable Forest Management Study

The study was undertaken in two parts. First, there was the literature search of national, regional, state and local level sustainability studies seeking model C&I formats. Then, there was a key informant interview process with people principally involved in the development of sustainability studies, to get their insights into selected aspects of these studies. One of the goals of the study was to determine which indicators are the most useful, relevant and cost-effective. Another goal was to determine if the studies are deemed valuable, complete, and applicable to the regions that have done them.

Existing Studies Reviewed

The following studies were reviewed for criteria and indicators:

- 2003 National Report on Sustainable Forests
- 2010 Draft National Report on Sustainable Forests
- 2007 Forest Sustainability Assessment for the Northern United States
- The Changing California: Forest and Range 2003 Assessment
- 2003 Forestry Program for Oregon and 2007-2009 Oregon Forests Report
- New Hampshire Forest Resources Plan Revision Assessment 2006
- Several State Forest Assessments using the Northeastern Area Base Indicators (18)
- Local Unit Criteria and Indicator Development Test (LUCID) 2002

The first two national studies (2003 & 2010) reflect all 67 indicators. The 2007 Northern Assessment and the Changing California studies also used all 67 indicators. The Oregon, New Hampshire, and state forest assessments used a self-

selected list of indicators. The LUCID test was at the national forest level, and each forest developed its own indicators, though it was found that there were 58 commonly used indicators. This particular experimental study was isolated, and the 58 indicators were not used after the study.

Key Informant Interviews

To focus on which indicators are the most useful, relevant and cost-effective, the consultants conducted telephone interviews with 13 state, local, and federal program administrators to elicit their level of satisfaction with the results of the studies and their recommendations for changes for conducting more detailed assessments. The interviewees are:

- Janet McLennan, former Natural Resources advisor to the Governor of Oregon
- Dean Cromwell, Cal Fire
- David Morman, Oregon Department of Forestry (retired)
- Jack Perdue, Maryland Department of Natural Resource
- Susan Francher, New Hampshire Division of Forests and Lands
- Rebecca Gass, Wisconsin Department of Natural Resources
- Jim Grace, Pennsylvania Department of Conservation and Natural Resources
- Don Outen, Baltimore County Department of Environmental Protection and Sustainability
- Rich Guldin, USDA Forest Service
- Joel Holtrop, USDA Forest Service
- Gary Larsen, Mt. Hood National Forest
- Guy Robertson, USDA Forest Service
- Sherri Wormstead, USDA Forest Service, Northeastern Area

There was a unanimous opinion that sustainability studies are of significant value for forest management, but that doing all 67 indicators recommended in the Montreal Process is too burdensome, impractical and costly. The representative of the Northeastern region told us that although their 2007 assessment is based on all 67 of the MPCI, future assessments will be limited to 18 selected indicators.

Respondents recommended selecting a limited number of indicators, not to exceed 20 indicators. As one respondent said, "In general, fewer indicators, well developed and that have commonly understood meaning, is better than a larger number that are less well developed or understood."

The number of indicators does not limit the quality or quantity of data to be collected, as there can be multiple metrics for a single indicator. Indicators are only as good as the metrics, which support them. Thus we must consider not just the criteria and indicators, but also the value and availability of the metrics. The interviewees all emphasized that both the C&I development process and the State

Forest Resource Assessment process require collaborative public input. The levels to which the example studies employed collaboration varied, but all used collaboration to some extent. Oregon developed its selected C&I from public meetings. The Northeastern Area used a group of state foresters and forest planners to derive their framework of C&I, and then each state used a public input process, usually employing listening sessions around the state and meetings of stakeholders to review the work as it was produced.

Advantages of Using a C&I Framework

A uniform framework for evaluating forest health and use of forest resources would be advantageous to the West by facilitating the identification of forest trends across state boundaries. The framework would result in cost savings for regional analyses, an improved adaptive management approach, and it would allow for the sharing of values among stakeholders including federal, state, tribal, local government and private landowners.

Using a consistent framework over time to evaluate forest sustainability will assist in adaptive management of forests. When decision-makers can see how management techniques affect trends for sustainability, they will be better equipped to recommend strategies for mitigating threats and improving forest health. The holistic framework of ecological, economic and social values allows decision-makers to check outcomes against expectations. The C&I provide a shared set of measures and objectives for forest management that reflects the values of the stakeholders. Different stakeholders bring different values to the table, and the balanced approach of the C&I allows the framework to be inclusive of these values. When people know that their values are included in the decision-making process, they are more accepting of collaborative decisions.

Regional Coordination and State Forest Assessments

Each state was required under the Cooperative Forestry Assistance Act, enacted under the 2008 Farm Bill, to submit a State Forest Resource Assessment and Strategy in June 2010, with updates every five years. These reports look at forest conditions, trends, and threats today and into the future, across all ownerships. The states identified priority areas within each state focusing on three goals: conserving working forest landscapes, protecting forests from threats, and enhancing public benefits from trees and forests. The companion State Forest Resource Strategies identified areas of high priority, in need of public and private investment in forest management. States did these studies autonomously, using formats developed by each state. While this recognizes the uniqueness of each state, it makes it difficult to identify trends occurring at a regional level, and to identify areas of high priority across state lines.

The Farm Bill calls for both state level analysis and interstate analysis. Using a common C&I framework would simplify and improve efficiencies in bringing together the regional picture. There is considerable overlap between the Farm Bill requirements for identifying conditions, trends and threats and the C&I criteria. If the Western states embark on sustainability studies using a common framework that employs C&I, those studies would provide much of the information required in the State Forest Assessments and Strategies. (Appendix D contains applicable language from Title VIII of the 2008 Farm Bill. Appendix E contains a "crosswalk" showing the requirements of the Farm Bill juxtaposed with the criteria from the MPCI).

An additional benefit is improved coordination of regional forest analysis and decision-making across international borders. Both Canada and Mexico are working on forest C&I studies using the internationally agreed upon MPCI framework.

Model Sustainability Frameworks

Based on the results of the Sustainable Forest Management Study, it is recommended that the Northeastern Area's 18 indicator framework and the 19 Oregon indicators be considered in-depth for their applicability to a Western model for C&I.

The Northeastern Area C&I Framework

The USDA Forest Service, Northeastern Area (NA) and the Northeastern Area Association of State Foresters (NAASF) went through a collaborative process to choose a minimum number of indicators that would reveal environmental, economic and social health related to sustainable forestry. They call the 18 indicators, selected from the MPCI, "the base indicators of forest sustainability". These indicators were chosen to provide a common framework for data collection across states, which can save time and expense in revealing cumulative effects and trends in forest resources. (Appendix F shows the NA/NAASF Base Indicators and a list of the 20 states in the Northeastern region).

The NA and NAASF committed to staffing and long-term coordination of a forest sustainability information clearinghouse in cooperation with the 20 state forestry agencies represented in the NAASF. The NAASF recommended that the base indicators be used to develop an NA-wide forest sustainability C&I assessment report not less than every 5 years. The NA/NAASF will review their criteria, indicators and metrics every five years to determine if they are fulfilling the intended purpose. The NA area had hoped to set a benchmark or measurable goal for each indicator, but that has not been possible yet. From their experience, they recommend that benchmarks be set at the state or local level and then be considered for the region.

In the Northeastern area, the U.S. Forest Service, State and Private Forestry has taken the lead role in implementing the C&I framework. U.S. Forest Service collects the information from 31 different data sources, including: FIA data, Census Bureau, USDA Forest Service, state foresters, Natureserve and other data sources, and provides it to states. They upload the data into an online information system, from which the states can access the information.

Respondents engaged in the Northeastern data collection system believe that the system could be easily expanded to report data nationally. The indicator and metrics information website will be available sometime in 2011. For more information on the Northeastern Area data resources, see http://www.na.fs.fed.us/sustainability/.

Oregon C&I Framework

Oregon began its process by developing a set of statewide strategic forest policies organized around seven goal statements. Each of the goal statements corresponds to one of the seven criteria of the MPCI. However, in response to public input, the goal wording is different and the order of the criteria was adjusted to make the statements relevant to and "owned" by Oregonians. Then an ad hoc advisory committee to the Oregon Board of Forestry was asked, "What would you need to know, to determine if the Oregon forests are being managed sustainably?" Working with technical experts, the advisory committee recommended 19 Oregon Indicators of Sustainable Management to measure progress towards the seven goals. The indicators were later endorsed by the Board of Forestry.

Ideally, Oregon's indicators should be:

- relevant
- understandable
- measurable consistently over time
- pass a common-sense test with the public
- repeatable
- feasible
- practical
- technically available
- sufficient to the purpose
- sensitive to change
- scale appropriate
- scientifically meritorious
- scalable to other discussions at other scales
- Economically feasible to maintain.

Oregon developed the 2003 Forestry Program for Oregon (FPFO) report and subsequent Oregon Indicators of Sustainable Forest Management reports using the Goals and Indicators as a framework for the discussion and measurement of the sustainable use of the state's public and private forests. Earlier FPFO documents referred to the goals as "strategies", changing the name in 2011. The Board of Forestry is in the process of updating its program, which may result in minor wording changes within the Goals and Indicators.

In addition to the public involvement process, which helped to develop the FPFO and Oregon's indicators, Oregon has convened a Roundtable on Sustainable Forests. This freeform Roundtable is patterned after the national Roundtable. It does not have set membership; instead, it invites the public to meetings to discuss any aspect of sustainable forest management, using the FPFO and the Oregon indicators and the framework for the discussion. Short-term Roundtable work has focused on citizen evaluations of the indicator reports produced to date. The Roundtable works as a sounding board, while offering public information and involvement.

On the ODF website, they provide indicator reports, Roundtable evaluations and background information for each indicator http://www.oregon.gov/ODF/indicators/index.shtml. (Appendix G shows the Oregon Goals and Indicators).

Comparison of Northeastern and Oregon C&I

The Oregon goals and the Northeastern criteria are essentially the same with small differences. Oregon uses the word goals instead of the word criteria, but each criterion is also a goal statement. The Northeastern Area uses the accepted wording of the MPCI for each criterion, whereas Oregon adapted the wording of the goals for state-level use. And, Oregon changed the order of the seven criteria.

Differences between the two frameworks are more apparent in the indicators than in the criteria, but they still have a remarkable amount of similarity and overlap. There are only a few indicators in each framework that differ significantly from the other framework. Oregon added one indicator, which NA does not have. This is their first indicator – Ability to measure and report on all other Oregon sustainable management indicators. This indicator calls for the evaluation of all the other indicators. It asks if current information is available on the other indicators and the quality of the data. Other areas of divergence are in the water and soil quality data within the environmental indicators, and in the financial measurements within the social indicators.

For ease of comparison, we will arrange the criteria and goals in the MPCI order. Northeastern criteria and indicators are shown in block print; Oregon goals are shown in italics. The criteria and goals are written out fully; the indicators are not specifically listed, but are compared in the paragraph below each criterion.

Criterion 1. Conservation of Biological Diversity
Goal E: *Contribute to the conservation of diverse native plant and animal populations and their habitats in Oregon's forests.*

Comparison: Indicators for both frameworks request descriptive information on the forest, such as composition, diversity, area, size class and age class, and percentage of protected forest lands. NA asks for degree of land conversion, fragmentation and parcelization; Oregon requests that same information under Goal

C (criterion 2). Both frameworks request information on species of concern or species at risk.

Criterion 2. Maintenance of Productive Capacity of Forest Ecosystems
Goal C: *Protect, maintain, and enhance the productive capacity of Oregon's forests to improve the economic well-being of Oregon's communities.*

Comparison: Oregon looks at development trend data here, rather than in Criterion 1. Both frameworks look at the volume of merchantable timber harvested; NA compares it to net growth, and Oregon compares it to both potential to grow wood and planned/projected harvest levels. NA requests the area of timberland.

Criterion 3: Maintenance of Forest Ecosystem Health and Vitality
Goal F: *Protect, maintain, and enhance the health and resiliency of Oregon's dynamic forest ecosystems, watersheds, and airsheds.*

Comparison: The NA criterion uses undefined concepts "ecosystem health" and "vitality" which may be interpreted differently by different people or groups. The NA indicator requests information on "damaging agents", while the Oregon indicators lists the threats: insects, disease and other damaging agents, invasive species, forest fuels and wildfire risks.

Criterion 4: Conservation and Maintenance of Soil and Water Resources
Goal D: *Protect, maintain, and enhance the physical and biological quality of the soil and water resources of Oregon's forests.*

Comparison: The sources of data for both the soil and water quality information are different. For soils, NA asks for land with diminished soil quality (which may be difficult to define and some respondents told us that the data is lacking here). Oregon instead looks at road risks to soil and water resources. For water quality, Oregon looks at specific measures of water quality by both biotic (macroinvertibrates) and abiotic (dissolved oxygen, nutrients, turbidity, temperature, etc) indicators. Oregon asks for two different scientific measures of water quality. NA looks at stream miles with impaired water quality as one of its metrics.

Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles
Goal G: *Enhance carbon storage and reduce carbon emissions in Oregon's forests and forest products.*

Comparison: The indicators are comparable.

Criterion 6: Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits to Meet the Needs of Societies

Goal B: *Ensure that Oregon's forests make a significant contribution towards meeting the nation's wood product needs and provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, efficient, and sustainable manner.*

Comparison: NA looks at the value and volume of wood/wood products and Oregon looks at forest products sector vitality. NA looks at outdoor recreational facilities and activities, and Oregon also looks at recreational use, but calls it "forest ecosystem services and contributions to society". NA asks for forest ownership and land use here, and Oregon included that in Indicator 2. Both frameworks ask for employment and wages. Where they differ: NA asks for public and private investments in forests, which Oregon does not request. And Oregon asks for forest revenues supporting state and local government services, which NA does not look at.

Criterion 7: Legal, Institutional, and Economic Framework for Forest Conservation and Sustainable Management
Goal A: *Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound environmental, economic, and social policies.*

Comparison: NA calls for monitoring of management standards and guidelines, which is similar to Oregon's indicator - compliance with forestry regulations. NA's indicator looking at forest-related planning, assessment and policy review relates to Oregon's indicator - development and maintenance of forest management knowledge.

Learning from Experience

We asked the interviewees to tell us which indicators were the most and the least valuable, practical, or useful in their assessments of forest sustainability, and if they felt that any indicators were missing from the C&I analysis.

Most respondents felt that all of the indicators were important. They said that they would not describe any indicators as being most important, that it is important to have the complete picture. However, the respondents did mention a few indicators for which information either was lacking or was difficult to respond to. And there were a few issues that were cited as potentially needing their own indicators. Noted lessons learned were:

- Degree of forestland conversion – Several respondents said they struggled to find a good metric for parcelization.

- Invasive species – In some states this information was easily available, in others it was lacking.

- Soil and water resources – Several states did not have good soil data.

- Air quality – There was concern over a good metric for air quality. One respondent suggested using the presence of lichens.

- Carbon storage – Several respondents pointed out that the scientific community is still arguing about both the importance of this indicator and how to measure it.

- Recreation/ecosystem services – Data was difficult to find because, even though we can count the facilities, we can't count the amount of participation in forest recreational activities.

- Compliance with regulations – Federal, private, and state regulations and guidelines may vary. It's difficult to find common metrics for compliance across ownerships. It was suggested that a policy discussion is needed among stakeholders to determine the desired range.

- Wildfire effects on social and economic well-being. Wildfire is considered a damaging agent to forests, under the NA Criterion 3, but there is no indicator for wildfire's potential threat to communities, or how using prescribed fire can mitigate the threat. Oregon has a separate indicator for wildfire in Goal F "Forest fuel conditions and trends related to wildfire risks", but this does not specify the threat to communities.

- Converting forests for gas/energy development. One state's forests are facing fragmentation from gas well and wind turbine development, access roads, and gas and electric transmission lines. The issue comes up in the fragmentation and parcelization indicator, plus the invasive species and soil and water quality indicators. This state felt it needed to add a separate indicator for its purposes.

- Urban forestry was not specifically addressed by an indicator in the NA framework, and several states felt there might be a need to create an indicator for it.

In 2010 the majority of Northeastern states used the C&I framework as a basis for their State Forest Assessments. The regional forest administrator told us, "It made it easy to find something if you were going from document to document because the structure was similar. We can pull together elements from states to the regional level." Several states reported that they believed their Assessments contained more scientific information and provided a useful tool for talking to the public and stakeholders due to the C&I format. State representatives said that using the C&I framework resulted in comprehensive assessments, which included more scientific information, and provided a useful tool for communicating with partners and the public.

Both the Northeastern Area and Oregon Board of Forestry will continue to review their indicators and associated metrics, looking for ways to improve them for the purposes of being able to identify trends, which may threaten forests, and to educate the public about forest health. Both groups expressed an interest in coordinating with the Western region to develop criteria, indicators and metrics, which could be applied regionally or nationally, to discern trends in forest related environmental, economic and social health across ownership types and state boundaries.

Use of Graphics in Assessments

There were some innovative ways that graphics were used to make the information in State Forest Assessments and C&I studies more accessible to residents and stakeholders. Easy to read graphic illustrations showing sustainable or unsustainable indicators, and how indicators are trending, were effective in starting conversations and interesting the public. (Appendix H shows graphic schemes used in the Pennsylvania and Oregon).

Conclusion

Western forests are facing pressures from fragmentation, invasive species, insects and diseases, and wildfire. Ecological decline of the forests and the resources derived from those forests will have an economic and social impact on the surrounding communities. It is the responsibility of the states and the leaders of forest policy to provide the guidance for long-term sustainability and productivity. To do that, we need to take a regional view of forest health and sustainability. The C&I framework is the best available tool for discerning cumulative trends across large landscapes.

Given the significant investment elsewhere in the country in sustainability studies and development of C&I frameworks, developing a Western model will be much more efficient if it is built on the existing frameworks. The Western states can benefit from the work on sustainability studies done in the Northeast and in Oregon. The Northeast and the State of Oregon look forward to coordinating with the West to create a model that might be applicable to all areas of the United States. State and regional sustainability studies will have an all lands approach that includes all ownerships to see positive or negative trends affecting forests.

The C&I framework for assessing sustainability fits well with the requirements of State Forest Assessments and with its anticipated study interval of five years. Common data sets can be utilized and data can be compiled in a central online database for use by each state. State processes and state data shall be used in the assessments. By employing a uniform framework for updates to State Forest

Assessments, trends in forest health can be seen across the West and appropriate management strategies can be formulated and actions taken to foster healthier forests, now and in the future.

Recommendations

1. *It is recommended that a collaborative process be developed involving stakeholders at the state and regional level for selecting the criteria and indicators. A representative group of stakeholders will include public and private forest landowners, state and federal forestry and wildlife agencies, environmental groups, sportsmen's groups, tribes and cultural heritage organizations, and other interested parties. This regional group would identify recommended indicators and metrics to support the indicators, using common data sets, state processes and state data.*

2. *It is recommended that the Western Region support inventory, monitoring and assessment programs and request assistance from the Departments of Agriculture and Interior for high level, regional coordination and data management. This will include compiling and assessing information on C&I from within all branches of the U.S. Forest Service and other agencies for periodic, area-wide reports on forest health and sustainability.*

3. *It is recommended that the Northeastern Area's framework (18) and the Oregon (19) framework be considered for their applicability to a Western model for C&I because of their success in use at both the state and regional levels.*

4. *It is recommended that the states incorporate stakeholder discussions focusing on available metrics as a key element of the sustainability study.*

Appendix A. WGA Policy Resolution 10-8

WESTERN GOVERNORS' ASSOCIATION

Western Governors' Association
Policy Resolution 10-8

Assessment & Management of Western Forests

A. BACKGROUND

1. American forests directly and positively influence the social, economic and ecological conditions of the country. They sustain and enrich the well-being of individuals and communities. And in the West, they are a huge part of the identity of its citizens and communities. The threats our forests face and the inadequacy of our current response to these threats have caused concern as to whether the nation's forests are, in fact, sustainable.

2. The United States has the fourth largest forest estate of any nation, with eight percent of the world's forests, exceeded only by the Russian Federation, Brazil and Canada. The amount and distribution of forest resources differs across the West. Total forested area per state ranges from 1.7 million acres in Hawaii to over 125 million acres in Alaska. Approximately 59 percent of all western forests are managed by the federal government, primarily the USDA Forest Service. These forests and woodlands vary from sparse scrub woodlands of the arid, interior West to the highly productive forests of the Pacific Coast and the South, and range from pure coniferous forests to multi-species mixtures, including extensive and diverse deciduous forests. In the West, these include magnificent forests of redwood, giant sequoia, Douglas-fir, ponderosa pine, Sitka spruce, lodgepole pine, noble fir and many other species.

3. Healthy forests enrich individuals and communities by providing services such as clean and abundant water, clean air, wood, wildlife habitat, access to recreation and spiritual renewal, employment and energy self-sufficiency. Forest health depends on the dynamic diversity of plants and animals, including humans, to perpetually maintain resilience. Sustainable forest health is a collaborative interdependent effort between our ecosystems and society.

4. There are increasing threats to these forest values. They include:
   - rapid loss to development - less green space and open space for recreation, wildlife, clean air and clean water;
   - the sale of industrial forest lands to real estate interests – forest land is being chopped up and sold;

- increasing insect and disease outbreaks and large-scale wildfires – loss of life, property and natural resources, enormous firefighting costs, threats to our water supply;
- loss of forest industry – increasing unemployment, damage to the social fabric of forest dependent rural communities, loss of tax dollars for schools, roads and other services;
- ineffective tax policies and assistance programs - families find it increasingly costly and difficult to keep forestland, and to pass it down to their children.
- a failure of U.S. international policy to ensure that all wood and wood products imported into the United States meet the same high environmental and social standards as wood produced within our own borders.

5. Federal forest land management and regulatory agencies are dominant forces driving outcomes in the forests of the Western United States, but these agencies have not always been full partners with state governments in developing a common landscape-scale vision for the sustainable management of forests.

6. Considering the above, we have come to a number of conclusions.
   - Our nation lacks a clear vision and policies that promote the sustainable management of the nation's public and private forests as an integrated and high priority.
   - Many of the problems faced by our forests derive from other much larger social and economic forces.
   - Engagement and collaboration with other partners outside of the traditional forestry community is needed.
   - Efforts to address these concerns across all regions of the country are needed.

7. Sustainable forest management (SFM) is an internationally accepted and applied concept that balances the environmental, social and economic values and services that forests provide. In 1987 the Bruntland Report, more formally known as *Our Common Future*, published by the UN World Commission on Environment and Development, broadly advanced the notion that sustainable development must meet the needs of the present generation without compromising those of future generations. Using that work, a set of *Forest Principles* was adopted by consensus on the part of nearly 180 countries in attendance at the1992 Rio Earth Summit. And since that time, numerous international forest policy dialogues have built on these *Principles* to develop and refine the criteria and indicators (C&I) which serve to define forests as sustainable. The United States has been a leader in these dialogues since inception, and from this nearly twenty years of work has matured a concept of sustainable forest resources that is globally endorsed and that represents a solid foundation for the development of a domestic national policy.

8. In 1998, the National Association of State Foresters and the USDA Forest Service jointly decided upon the (C&I) to define and implement SFM. They agreed the C&I could provide a clearer vision for the management of the nation's public and private forest lands and could articulate a policy of SFM to guide the stewardship of all the nation's forests. NASF endorsed the criteria as a framework for integrating and measuring sustainable forest management. Strong USFS and academic leadership, combined with continuing interest in SFM, both domestically and internationally, has resulted in the creation of a multi-stakeholder Roundtable on Sustainable Forests and the development of a 2003 and 2010 US National Report on Sustainable Forests. Planned future actions of the Roundtable are to release final national reports (12 nations) utilizing the C&I, involvement in the 2011 International Year of the Forest and the 8th US Forest Congress.

9. The Roundtable on Sustainable Forests is an open and inclusive process committed to the goal of SFM on public and private lands in the United States. Roundtable participants include public and private organizations and individuals committed to better decision-making through shared learning and increased understanding. Current co-chair positions are held by the USFS and the Sustainable Forests Partnership (Oregon State University, Penn State University, and Auburn University). Roundtable efforts have stimulated a national discussion of sustainable forest management, served as the catalyst for more collaborative data management and evaluation, and increased coordination of state assessments of the nation's forests. Member states, such as California, Hawaii, Washington, and Oregon have used the C&I to establish policies and a clearer vision for sustainable forest management.

10. Key to this vision of sustainability is that forests across large areas must be able to deliver a full and integrated set of economic, environmental and social values. Forests that generate economic value provide the means to fund environmental and social benefits. This is true on both public and private ownerships. At the same time, by protecting a forest's environmental values, sustainable forestry maintains the basic soil, water and biological elements that underpin economic value. Equally important, is the need for forests to deliver a robust set of social values so that citizens ultimately have the emotional commitment to keep and nourish forests appropriately for all benefits.

B. GOVERNORS' POLICY STATEMENT

1. Western Governors believe the country needs to look at new, more effective models for government and societal involvement aimed at sustaining America's forests for future generations. To this end, the Governors recommend pursuit of an all-lands approach to protecting and maintaining America's forests and a national policy on sustainable forests. Existing criteria

and indicators for the conservation and sustainable management of the nation's forests provide an in-place framework to inform our work towards these goals.

2. Western Governors are committed to clarifying and enhancing the roles of federal, state and local governments in relation to defining and measuring sustainable forest management, promoting regional collaboration, joint planning and coordinated action.

3. The Western Governors hold that:
   - The management and conservation of forest resources in the United States should be guided by a mandate to meet the forest-related needs of the present generation without compromising the ability of future generations to meet their needs.
   - Doing so requires that economic, social and environmental values from forests be provided within a framework where these values are mutually supportive.
   - Laws and programs should support sustainable forest management and recognize the inter-connectedness of environmental, social and economic values.

4. Western Governors believe that pursuit of policies true to the concept of sustainable forests would result in:
   - improved consistency and delivery of forest goods and services,
   - regional landscape level approaches to forest management that assure core areas for economic/community sustainability and biodiversity,
   - revision of relevant forest and tax legislation,
   - interagency cooperation and better efficiencies for forest management and related data gathering and reporting, and
   - a framework and policy context to U.S. engagement in international forest policy.

C. GOVERNORS' MANAGEMENT DIRECTIVE

1. The WGA Forest Health Advisory Committee will propose recommendations for a common set of indicators of environmentally, economically, and socially sustainable forest management for the Western States. This set of indicators will draw upon the globally endorsed C&I and subsequent national reports that define criteria and indicators for sustainable forest management.

2. WGA will serve as a catalyst and leader to ensure that a national forest policy review and discussion results in tangible improvements to the nation's forest resource, which includes adaptive management practices.

3. WGA will promote the management and monitoring of forest stands and landscapes that ensures diversity and resilience.

4. WGA will actively participate in the Roundtable on Sustainable Forests.

5. WGA will seek funding to assist in the implementation of this resolution. Further, WGA will post this resolution to its Web site to be used and referred to as necessary.

Appendix B. History of the MPCI

History of Dialogue Related to U.S. Government Commitment to Sustainable Forest / Resource Management

(Updated October 2002 by Ruth McWilliams of the USDA-Forest Service)
Source: http://www.sustainableforests.net/docs/2010/2-History_US_Dialogue_updated_101002.pdf

1968 International Conference for Rational Use and Conservation of the Biosphere (Paris, France): United Nations Educational, Scientific, and Cultural Organization (UNESCO) held pioneering event for discussing ecologically sustainable development.

1972 United Nations Conference on the Human Environment (Stockholm, Sweden; known as Stockholm Conference): Addressed economic and environmental issues and led to United Nations Environment Program (UNEP)—mission is "to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations."

1983 World Commission on Environment and Development (known as Brundtland Commission): Prime Minister of Norway (Gro Harlem Brundtland) asked by Secretary General of United Nations to lead a special commission.
Addressed how the world community could:

- Develop a long-term environmental strategy for achieving sustainable development by the year 2000 and beyond.
- Define a shared perception of long-term environmental issues and appropriate efforts to deal with them effectively.

1984 International Conference on Environment and Economics (OECD): Concluded that environment and economics should be mutually reinforcing. Helped shape *Our Common Future* (see below).

1987 *Our Common Future* (also known as Brundtland Report): Published report of the World Commission on Environment and Development popularized term 'sustainable development.'

Defined 'sustainable development' as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

1992 United Nations Conference on Environment and Development (Rio de Janeiro, Brazil; known as Earth Summit): Established 'sustainable development' as a common goal of human development for the 160 or so countries that attended the meeting. Recognized sustainable management of forests as key component to sustainable development.
Set out Agenda 21 as a blueprint for action in the 21st century; includes non-binding Statement of Forest Principles that provides guidelines for sustainable forest management.

1993 United Nations Commission on Sustainable Development (CSD): CSD established to help countries implement Agenda 21 in follow-up to Earth Summit. International Seminar of Experts on Sustainable Development of Boreal and Temperate Forests (Montreal, Quebec, Canada): Resulted in initiative to develop and implement internationally agreed criteria and indicators for the conservation and sustainable management of temperate and boreal forests.

Second Ministerial Conference on the Protection of Forests in Europe (Helsinki, Finland): USDA-Forest Service, representing U.S. as observer country, stated belief that all countries, not just members of the International Tropical Timber Organization, should adopt the goal of sustainable forest management by the year 2000.

Presidential Decision Directive / NSC-16 (United States): Stated that United States committed "...to a national goal of achieving sustainable management of U.S. forests by the year 2000."

Interagency Ecosystem Management Task Force (United States): Established in August 1993 to further President's National Performance Review calling for agencies of the federal government to adopt "a proactive approach to ensuring a sustainable economy and a sustainable environment through ecosystem management."
Released report in June 1995 titled *The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies* that presented findings and recommendations.

1994 United States GAO Report on Ecosystem Management (United States): United States General Accounting Office (GAO) examined Administration's federal management and natural resources framework for Congressional requestors, resulting in report dated April 29, 1994, titled *Ecosystem Management: Additional Actions Needed to Adequately Test a Promising Approach.*

Barriers identified as: (1) problems with data, (2) problems with interagency coordination, and (3) insufficient collaboration with non-federal parties.

Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (Geneva, Switzerland): Ten countries

establish "Montreal Process" and hold first meeting in September 1994: Australia, Canada, Chile, China, Japan, Mexico, New Zealand, Republic of Korea, Russian Federation, and United States.

International Conference on Population and Development (Cairo, Egypt): Conference gave high profile to view that extreme poverty and a short of essential environmental resources can exacerbate ethnic and political divisions.

1994 Santiago Declaration (Santiago, Chile): Original ten Montreal Process countries (listed above) endorsed on February 3, 1995, a statement of political commitment together with a comprehensive set of seven criteria and sixty-seven indicators for the conservation and sustainable management of temperate and boreal forests.
Now includes twelve countries on five continents comprising 60 percent of the world's forests, 90 percent of the world's temperate and boreal forests, and 35 percent of the world's population: original ten (listed above) plus Argentina and Uruguay.

Intergovernmental Panel on Forests (IPF): United Nations Commission on Sustainable Development established IPF to continue forest policy dialogue following Earth Summit for two years, with first IPF meeting held on September 11-15, 1995, in New York City.

1996 Montreal Process Technical Advisory Committee (TAC): TAC established to support Montreal Process.
Working Group agrees that all participating countries will prepare First Approximation Reports.

President's Council on Sustainable Development (United States): Released report, *Sustainable America—A New Consensus*, that:

- Outlined goals for "economic prosperity, environmental protection, and social equity together" (known as the 3 e's)
- Included policy recommendation on sustainable forest management: "Establish a structured process involving a representative group of stakeholders to facilitate public and private efforts to define and achieve the national goal of sustainable management of forests by the year 2000."

Seventh American Forest Congress (United States): More than 1500 citizens gathered in Washington, DC to discuss "what common ground do we have with regard to America's forests?" and developed vision elements and set of principles, many of which include 'sustainability.'

United States Department of Agriculture Policy (USDA) (United States): Secretary established Department-wide policy on Sustainable Development (Secretary's Memorandum 9500-6) focusing on sustainable agriculture, sustainable forestry, and sustainable rural community development.

1997 Intergovernmental Panel on Forests Proposals for Action: IPF Proposals for Action were presented to the United Nations and endorsed by the Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21 (UNGASS).

Intergovernmental Forum on Forests (IFF): IFF established in July 1997 by the United Nations Economic and Social Council (ECOSOC) under the Commission on Sustainable Development as successor to IPF to continue policy dialogue on forests, with program of work including IPF's Proposals for Action.

Montreal Process First Approximation Report: Participating countries developed individual country reports for Montreal Process to "share lessons learned." The countries then prepared a consolidated report, published and presented along with reports by other regional initiatives at Eleventh World Forestry Congress (Antalya, Turkey).

National Association of State Foresters' Resolution on Criteria and Indicators for Sustainable Forest Management (United States): National Association of State Foresters (NASF) approved Resolution Number 1997-6 on September 18, 1997.

National Association of State Foresters and USDA-Forest Service (United States): NASF and USDA-Forest Service (FS) exchanged letters leading to further commitment by FS to sustainable forest management.

1998 Private Sector Support (United States): Six private sector organizations wrote Office of Management and Budget (OMB) and Council on Environmental Quality (CEQ) within Federal government to urge cooperation among Federal agencies in data collection: NASF, Global Forest Policy Project, American Forest & Paper Association, National Audubon Society, Society of American Foresters, and World Wildlife Fund.

G-8 Foreign Ministers: Ministers fully endorsed the 1997 outcomes of the UNGASS meeting on sustainable forest management. Published, and committed member countries to implement, the Action Program on Forests.

Set out specific measures to promote sustainable forest management which featured implementation of national criteria and indicators.

Multi-Stakeholder Meeting on Sustainable Resource Management (United States): In response to a private sector letter to the Office of Management and Budget (OMB) and the Council on Environmental Quality (CEQ), the FS convened public meeting for public and private sector representatives to share perspectives about Montreal Process and discuss opportunities to foster sustainable forest and resource management in the United States.

Oregon's First Approximation Report (FAR) (United States): FAR is the State of Oregon's Report on the Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests developed through the Montreal Process. Oregon, the first state in the nation to apply the national criteria to its forests, did so under the guidance of its Board of Forestry and Department of Forestry.

Great Lakes Sustainable Forest Management Report (United States and Canada): Report for the Great Lakes Forest Alliance involving Michigan, Minnesota, Ontario, and Wisconsin, dated June 4, 1998, on *Assessing Program in Sustainable Forest Management: Proposed Criteria and Indicators for the Upper Great Lakes Region* reflects public input forums and advice of a technical assistance group.

1999 Roundtable on Sustainable Forests (United States): Self-chartered with federal and non-federal co-chairs, and facilitated by Meridian Institute "...to serve as a forum to share information and perspectives that will enable better decision making in the U.S. regarding sustainable forests."

Initial focus "is to implement and promote utilization of the Criteria and Indicators (C&I) contained in the Santiago Declaration of the Montreal Process as a means of measuring national progress towards achievement of this goal."

Sustainable Rangelands Roundtable (United States): Organized as a companion process to the Roundtable on Sustainable Forests and facilitated by Colorado State University with federal and non-federal involvement to "identify indicators of sustainability based on social, economic, and ecological factors, to provide a framework for national assessments of rangelands and rangeland use."

Sustainable Minerals Roundtable (United States): Includes federal agencies and non-federal organizations, convened by the University of Nevada-Reno, "to support the nation's commitment to sustainable development" and to "develop indicators of sustainability, based on social, economic, and environmental factors, to provide a means for assessing the status and trends of minerals/materials and energy systems."

Our Common Journey (United States): Report of four-year study conducted by the National Research Council within the National Academy of Sciences published in response to request from major benefactor, George P. Mitchell, to address the research needs for the global commons of atmosphere, land, and water as well as to respond to the Academies' desire to reinvigorate the role of science and development in sustainable development and to contribute to the meeting of 80 international academies in 2000 on the topic of a transition toward sustainability.

2000 United Nations Forum on Forests (UNFF): Established in February 2000 as a non-legally binding permanent intergovernmental body to "promote the management,

conservation and sustainable development of all types of forests..." and to facilitate and promote the implementation of proposals for action emanating from the Intergovernmental Panel on Forests and its successor, the Intergovernmental Forum on Forests, over a five year period.

Federal Memorandum of Understanding on Sustainable Forest Management Data (United States): Memorandum of Understanding (MOU) initially signed October 16, 2000, by nine Federal agencies in U.S; included twelve agencies as of September 2001 provides:

- A common interagency forum for Federal coordination to resolve issues integral to collecting, monitoring, analyzing, reporting, and making data available on an ongoing basis related to the Montreal Process Criteria and Indicators.
- A process for helping the Federal agencies develop a national report by 2003 for policy makers and the public in the United States and for the Montreal Process on the state of the Nation's forests and progress towards sustainable forest management in the United States.

2000 Sustainable Forest Data Working Group of Federal Geographic Data Committee (FGDC) (United States): FGDC Working Group chartered in February 2001 to further the goal of sustainable forest resources by fostering the standardization and implementation of criteria and indicators of sustainability; and responsible for developing annual work plans to implement the Federal MOU on Sustainable Forest Management Data.

UNFF—Organizational Meeting and First Session: Organizational Meeting of UNFF held, which led to First Session where a Multi-Year Program of Work (MYPOW) was adopted to focus work of future UNFF sessions on specific issues and at which the work of the Collaborative Partnership on Forests was initiated.

United Nations Millennium Declaration: General Assembly Resolution 55/2—United Nations Millennium Declaration—was adopted by countries of the United Nations during the Millennium Summit to reaffirm their commitment to "a more peaceful, prosperous and just world."

Declaration identifies eliminating poverty as highest priority; and includes related Millennium Development Goals.

Section on 'Protecting our common environment' emphasizes need to adopt a new ethic of conservation and stewardship, with steps including "to intensify our collective efforts for the management, conservation and sustainable development of all types of forests."

United Nations Economic Commission for Europe (ECE): Countries in Europe and North America, participating in the ECE Regional Ministerial Meeting for the World Summit on Sustainable Development held in Geneva, Switzerland, adopted a Ministerial Statement that focuses on two overarching objectives: Poverty eradication, and

Sustainable production and consumption patterns. Related priorities include: Sustainable management and conservation of natural resources, Environment and health, Making globalization work for sustainable development, Improving governance and democratic processes at all levels, Education, Science and technology, and Financing for sustainable development as a crucial cross-cutting issue.

NASF Sustainable Forestry Implementation Committee (SFIC) (United States): NASF, at its 79th Annual Meeting, reaffirmed its "strong commitment to leadership and involvement in sustainable forestry in the United States" in Resolution Number 2001-1 that changed the status of its ad hoc SFIC to a standing committee.

Society of American Foresters' Sustainability and Forest Certification Working Group (United States): New working group created to focus on cross-cutting aspect of sustainable forestry and forest certification systems as well as to help support activities of other Society working groups and committees with related interests.

First Approximation Report for States of the Northeast and Midwest (United States): Result of two-year assessment published by the USDA-Forest Service in cooperation with State Foresters and State Forest Resource Planners within 20-state region includes a *Sourcebook on Criteria and Indicators of Forest Sustainability in the Northeastern Area* dated May 2002.

UNFF—Second Session (UNFF2): UNFF2 addressed progress related to environmental aspects of the conservation and sustainable management of forests (e.g., deforestation and forest degradation) as well as concepts, terminology, and definitions. Included Ministerial segment during which a "Ministerial Statement and Message to the World Summit on Sustainable Development" was adopted.

World Summit on Sustainable Development (Johannesburg, South Africa): Summit resulted in two negotiated documents: *Johannesburg Declaration on Sustainable Development* and *Johannesburg Plan of Implementation.*

Also focused implementation of Agenda 21 set out at the 1992 Earth Summit on more integrated and cross-sectoral solutions through voluntary public/private partnerships for sustainable development.

Appendix C. Montreal Process Criteria and Indicators

Source: http://www.rinya.maff.go.jp/mpci/meetings/an-6.pdf

THE MONTRÉAL PROCESS CRITERIA AND INDICATORS (2007)

The current set of Montréal Process criteria and indicators continues is based on contemporary scientific understanding of temperate and boreal forest ecosystems and the values society attaches to forests. Criteria 1-6 and associated indicators relate specifically to forest conditions or functions, and to the values or benefits associated with forest goods and services. Criterion 7 and its indicators (which are now under review) relate to the overall policy framework needed to facilitate and support forest conservation and sustainable management. This policy framework includes aspects often external to the forest itself but which affect efforts to conserve, maintain or enhance one or more of the conditions, functions, values or benefits captured in Criteria 1-6.

Criterion 1 Conservation of biological diversity

1.1.a ***Ecosystem diversity*** **1.1.a** Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure
1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage
1.1.c Fragmentation of forests

1.2 ***Species diversity***
1.2.a Number of native forest associated species
1.2.b Number and status of native forest associated species at risk, as determined by legislation or scientific assessment
1.2.c Status of on site and off site efforts focused on conservation of species diversity

1.3 ***Genetic diversity***
1.3.a Number and geographic distribution of forest associated species at risk of losing genetic variation and locally adapted genotypes
1.3.b Population levels of selected representative forest associated species to describe genetic diversity
1.3.c Status of on site and off site efforts focused on conservation of genetic diversity

Criterion 2 Maintenance of productive capacity of forest ecosystems

2.a Area and percent of forest land and net area of forest land available for wood production
2.b Total growing stock and annual increment of both merchantable and non-merchantable tree species in forests available for wood production
2.c Area, percent, and growing stock of plantations of native and exotic species

2.d Annual harvest of wood products by volume and as a percentage of net growth or sustained yield
2.e Annual harvest of non-wood forest products

Criterion 3 Maintenance of forest ecosystem health and vitality

3.a Area and percent of forest affected by biotic processes and agents (e.g. disease, insects, invasive species) beyond reference conditions
3.b Area and percent of forest affected by abiotic agents (e.g. fire, storm, land clearance) beyond reference conditions

Criterion 4 Conservation and maintenance of soil and water resources

4.1 ***Protective function***
4.1.a Area and percent of forest whose designation or land management focus is the protection of soil or water resources

4.2 ***Soil***
4.2.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources
4.2.b Area and percent of forest land with significant soil degradation

4.3 ***Water***
4.3.a Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources.
4.3.b Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions

Criterion 5 Maintenance of forest contribution to global carbon cycles

5.a Total forest ecosystem carbon pools and fluxes
5.b Total forest product carbon pools and fluxes
5.c Avoided fossil fuel carbon emissions by using forest biomass for energy

Criterion 6 Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

6.1 ***Production and consumption***
6.1.a Value and volume of wood and wood products production, including primary and secondary processing
6.1.b Value of non-wood forest products produced or collected
6.1.c Revenue from forest based environmental services
6.1.d Total and per capita consumption of wood and wood products in round wood equivalents
6.1.e Total and per capita consumption of non-wood products
6.1.f Value and volume in round wood equivalents of exports and imports of wood products

6.1.g Value of exports and imports of non-wood products
6.1.h Exports as a share of wood and wood products production and imports as a share of wood and wood products consumption
6.1.i Recovery or recycling of forest products as a percent of total forest products consumption

6.2 ***Investment in the forest sector***
6.2.a Value of capital investment and annual expenditure in forest management, wood and non-wood product industries, forest-based environmental services, recreation and tourism
6.2.b Annual investment and expenditure in forest-related research, extension and development, and education

6.3 ***Employment and community needs***
6.3.a Employment in the forest sector
6.3.b Average wage rates, annual average income and annual injury rates in major forest employment categories
6.3.c Resilience of forest-dependent communities
6.3.d Area and percent of forests used for subsistence purposes
6.3.e Distribution of revenues derived from forest management

6.4 Recreation and tourism
6.4.a Area and percent of forests available and/or managed for public recreation and tourism
6.4.b Number, type, and geographic distribution of visits attributed to recreation and tourism and related to facilities available

6.5 Cultural, social and spiritual needs and values
6.5.a Area and percent of forests managed primarily to protect the range of cultural, social and spiritual needs and values
6.5.b The importance of forests to people

Criterion 7 Legal, institutional and policy framework for forest conservation and sustainable management*

7.1 Extent to which the legal framework (laws, regulations, guidelines) supports the conservation and sustainable management of forests, including the extent to which it:
7.1.a Clarifies property rights, provides for appropriate land tenure arrangements, recognizes customary and traditional rights of indigenous people, and provides means of resolving property disputes by due process;
7.1.b Provides for periodic forest-related planning, assessment, and policy review that recognizes the range of forest values, including coordination with relevant sectors;
7.1.c Provides opportunities for public participation in public policy and decision-making related to forests and public access to information;
7.1.d Encourages best practice codes for forest management;

7.1.e Provides for the management of forests to conserve special environmental, cultural, social and/or scientific values.

7.2 Extent to which the institutional framework supports the conservation and sustainable management of forests, including the capacity to:
7.2.a Provide for public involvement activities and public education, awareness and extension programs, and make available forest-related information;
7.2.b Undertake and implement periodic forest-related planning, assessment, and policy review including cross-sectoral planning and coordination;
7.2.c Develop and maintain human resource skills across relevant disciplines;
7.2.d Develop and maintain efficient physical infrastructure to facilitate the supply of forest products and services and support forest management;
7.2.e Enforce laws, regulations and guidelines.

7.3 Extent to which the economic framework (economic policies and measures) supports the conservation and sustainable management of forests through:
7.3.a Investment and taxation policies and a regulatory environment which recognize the long-term nature of investments and permit the flow of capital in and out of the forest sector in response to market signals, non-market economic valuations, and public policy decisions in order to meet long-term demands for forest products and services;
7.3.b Non-discriminatory trade policies for forest products.

7.4 Capacity to measure and monitor changes in the conservation and sustainable management of forests, including:
7.4.a Availability and extent of up-to-date data, statistics and other information important to measuring or describing indicators associated with criteria 1-7;
7.4.b Scope, frequency and statistical reliability of forest inventories, assessments, monitoring and other relevant information;
7.4.c Compatibility with other countries in measuring, monitoring and reporting on indicators.

7.5 Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services, including:
7.5.a Development of scientific understanding of forest ecosystem characteristics and functions;
7.5.b Development of methodologies to measure and integrate environmental and social costs and benefits into markets and public policies, and to reflect forest-related resource depletion or replenishment in national accounting systems;
7.5.c New technologies and the capacity to assess the socio- economic consequences associated with the introduction of new technologies;
7.5.d Enhancement of ability to predict impacts of human intervention on forests;
7.5.e Ability to predict impacts on forests of possible climate change.

Appendix D. Farm Bill, Title VIII, Section 8001

Source: http://www.fsa.usda.gov/Internet/FSA_File/title8forestry_fb08.pdf

Farm Bill, Title VIII, Section 8001.

H. R. 6124—391

TITLE VIII—FORESTRY

Subtitle A—Amendments to Cooperative Forestry Assistance Act of 1978

SEC. 8001. NATIONAL PRIORITIES FOR PRIVATE FOREST CONSERVATION.

Section 2 of the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2101) is amended—

(1) by redesignating subsections (c) and (d) as subsections (e) and (f), respectively; and

(2) by inserting after subsection (b) the following new sub- sections:

''(c) PRIORITIES.—In allocating funds appropriated or otherwise made available under this Act, the Secretary shall focus on the following national private forest conservation priorities, not with- standing other priorities specified elsewhere in this Act:

''(1) Conserving and managing working forest landscapes for multiple values and uses.

''(2) Protecting forests from threats, including catastrophic wildfires, hurricanes, tornados, windstorms, snow or ice storms, flooding, drought, invasive species, insect or disease outbreak, or development, and restoring appropriate forest types in response to such threats.

''(3) Enhancing public benefits from private forests, including air and water quality, soil conservation, biological diversity, carbon storage, forest products, forestry-related jobs, production of renewable energy, wildlife, wildlife corridors and wildlife habitat, and recreation.

''(d) REPORTING REQUIREMENT.—Not later than September 30, 2011, the Secretary shall submit to Congress a report describing how funds were used under this Act, and through other programs administered by the Secretary, to address the national priorities specified in subsection (c) and the outcomes achieved in meeting the national priorities.''.

SEC. 8002. LONG-TERM STATE-WIDE ASSESSMENTS AND STRATEGIES FOR FOREST RESOURCES.

The Cooperative Forestry Assistance Act of 1978 is amended by inserting after section 2 (16 U.S.C. 2101) the following new section:

''SEC. 2A. STATE-WIDE ASSESSMENT AND STRATEGIES FOR FOREST RESOURCES.

''(a) ASSESSMENT AND STRATEGIES FOR FOREST RESOURCES.— For a State to be eligible to receive funds under the authorities of this Act, the State forester of that State or equivalent State official shall develop and submit to the Secretary, not later than two years after the date of enactment of the Food, Conservation, and Energy Act of 2008, the following:

''(1) A State-wide assessment of forest resource conditions, including—

''(A) the conditions and trends of forest resources in that State; H. R. 6124—392

''(B) the threats to forest lands and resources in that State consistent with the national priorities specified in section 2(c);

''(C) any areas or regions of that State that are a priority; and

''(D) any multi-State areas that are a regional priority. ''(2) A long-term State-wide forest resource strategy,

including— ''(A) strategies for addressing threats to forest

resources in the State outlined in the assessment required by paragraph (1); and

''(B) a description of the resources necessary for the State forester or equivalent State official from all sources to address the State-wide strategy.

''(b) UPDATING.—At such times as the Secretary determines to be necessary, the State forester or equivalent State official shall update and resubmit to the Secretary the State-wide assessment and State-wide strategy required by subsection (a).

''(c) COORDINATION.—In developing or updating the State-wide assessment and State-wide strategy required by subsection (a), the State Forester or equivalent State official shall coordinate with—

''(1) the State Forest Stewardship Coordinating Committee established for the State under section 19(b);

''(2) the State wildlife agency, with respect to strategies contained in the State wildlife action plans;

''(3) the State Technical Committee; ''(4) applicable Federal land management agencies; and ''(5) for purposes of the Forest Legacy Program under section 7, the State lead agency designated by the Governor.
''(d) INCORPORATION OF OTHER PLANS.—In developing or updating the State-wide assessment and State-wide strategy required by subsection (a), the State forester or equivalent State official shall incorporate any forest management plan of the State, including community wildfire protection plans and State wildlife action plans.
''(e) SUFFICIENCY.—Once approved by the Secretary, a State- wide assessment and State-wide strategy developed under sub- section (a) shall be deemed to be sufficient to satisfy all relevant State planning and assessment requirements under this Act.
''(f) FUNDING.— ''(1) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section up to $10,000,000 for each of fiscal years 2008 through 2012. ''(2) ADDITIONAL FUNDING SOURCES.—In addition to the funds appropriated for a fiscal year pursuant to the authorization of appropriations in paragraph (1) to carry out this section, the Secretary may use any other funds made available for planning under this Act to carry out this section, except that the total amount of combined funding used to carry out this
section may not exceed $10,000,000 in any fiscal year.
''(g) ANNUAL REPORT ON USE OF FUNDS.—The State forester or equivalent State official shall submit to the Secretary an annual report detailing how funds made available to the State under this Act are being used.''.
H. R. 6124—393

Appendix E. Crosswalk of State Forest Assessment Requirements and the MPCI Criteria

Note: Requirements of the Farm Bill are shown in block print and applicable Criteria from the MPCI are shown in italics.

- Identify and provide an analysis of present and future forest conditions, trends, and threats on all ownerships.

Criteria 1: Conservation of biological diversity;
Criteria 2: Maintenance of productive capacity of forest ecosystems;
Criteria 3: Maintenance of forest ecosystem health and vitality;
Criteria 4: Conservation of soil and water resources.

- Identify any areas or regions of that state that are a priority.

Analysis of criteria 1,2,3,4 at the state level

- Identify any multi-state areas that are a regional priority.

Analysis of criteria 1,2,3,4 at the regional level

- Incorporate existing forest management including state wildfire action plans and community wildfire protection plans.

Criteria 7: Legal, institutional and economic framework for forest conservation and sustainable management.

- Conserve working forest landscapes.

Analysis from Criteria 1,2,3,4

- Protect forests from threats

Analysis from Criteria 3 and 4

- Enhance public benefits from trees and forests

Criteria 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies.

Appendix F. NA/NAASF Base Indicators of Forest Sustainability

Source: http://www.na.fs.fed.us/sustainability/base/base.shtm

*Note: No priority or order is implied in the numeric listing of the criteria and indicators.

Criterion 1: Conservation of Biological Diversity

1. Area of forest land relative to total land and area of reserved forest land
2. Extent of area by forest type and by size class, age class, and successional stage
3. Degree of forest land conversion, fragmentation, and parcelization
4. Status of forest/woodland communities and species of concern (with focus on forest- associated species)

Criterion 2: Maintenance of Productive Capacity of Forest Ecosystems

5. Area of timberland
6. Annual removal of merchantable wood volume compared to net growth

Criterion 3: Maintenance of Forest Ecosystem Health and Vitality

7. Area and percent of forest land affected by potentially damaging agents

Criterion 4: Conservation and Maintenance of Soil and Water Resources

8. Area and percent of forest land with diminished soil quality
9. Area and percent of forest land adjacent to surface water and area of forested land by watershed
10. Water quality in forested areas

Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles

11. Forest ecosystem biomass and forest ecosystem and forest products carbon pools

Criterion 6: Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits to Meet the Needs of Societies

12. Value and volume of wood and wood products production, consumption, and trade
13. Outdoor recreational facilities and activities
14. Public and private investments in forest health, management, research, and wood processing
15. Forest ownership and land use (including acres of specially designated land)
16. Employment and wages in forest-related sectors

Criterion 7: Legal, Institutional, and Economic Framework for Forest Conservation and Sustainable Management

17. Existence, type, and monitoring of forest management standards/guidelines
18. Existence, type, and frequency of forest-related planning, assessment, and policy review

Northeastern Area States

Maine
New Hampshire
Vermont
Massachusetts
Rhode Island
Connecticut
New York
New Jersey
Pennsylvania
Delaware
Maryland
West Virginia
Ohio
Michigan
Illinois
Minnesota
Wisconsin
Iowa
Missouri
Indiana

Appendix G. Oregon Strategies and Indicators

Source: http://www.oregon.gov/ODF/indicators/list.shtml

Goal A: Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound environmental, economic, and social policies.

Indicators:
- A.a. Ability to measure and report on all other Oregon sustainable forest management indicators.
- A.b. Development and maintenance of sustainable forest management knowledge
- A.c. Compliance with forestry regulations

Goal B: Ensure that Oregon's forests make a significant contribution towards meeting the nation's wood product needs and provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, efficient, and sustainable manner.

Indicators:
- B.a. Forest revenues supporting and local government public services
- B.b. Forest-related employment and wages
- B.c. Forest ecosystem services contributions to society
- B.d. Forest products sector vitality

Goal C: Protect, maintain, and enhance the productive capacity of Oregon's forests to improve the economic well-being of Oregon's communities.

Indicators:
- C.a. Area of non-federal forestland and development trends
- C.b. Timber harvest trends compared to planned and projected harvest levels, and the potential to grow wood

Goal D: Protect, maintain, and enhance the physical and biological quality of the soil and water resources of Oregon's forests.

Indicators:
- D.a. Water quality of forest streams
- D.b. Biological integrity of forest streams
- D.c. Forest road risks to soil and water resources

Goal E: Contribute to the conservation of diverse native plant and animal populations and their habitats in Oregon's forests.

Indicators:

- E.a. Composition, diversity, and structure of forest vegetation
- E.b. Extent of area by forest cover type in protected area categories
- E.c. Forest plant and animal species at risk

Goal F: Protect, maintain, and enhance the health and resiliency of Oregon's dynamic forest ecosystems, watersheds, and airsheds.

Indicators:

- F.a Tree mortality from insects, diseases, and other damaging agents
- F.b Invasive species trends on forestlands
- F.c Forest fuel conditions and trends related to wildfire risks

Goal G: Enhance carbon storage and reduce carbon emissions in Oregon's forests and forest products.

Indicators:

- G.a. carbon stocks on forestlands and in forest products

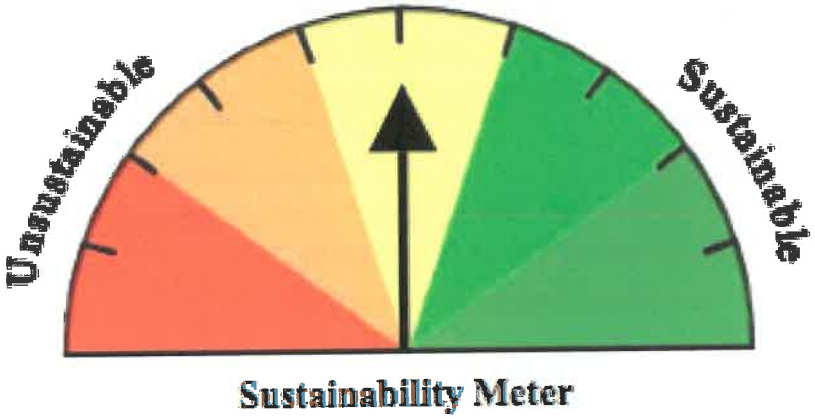
Appendix H. Using Graphics

Source: http://www.dcnr.state.pa.us/forestry/farmbill/assessment.aspx; http://www.oregon.gov/ODF/indicators/indicatorAa.shtml

Communicating the Sustainability Message

While the Northeastern Area has uniform criteria and indicators for assessing forests, there is still ample leeway for the states to tailor assessments to their own needs and attributes. The State of Pennsylvania added a "Sustainability Meter" to their assessment document, which took each indicator and showed graphically where the attribute fell in a range from unsustainable to sustainable. The Sustainability Meter is shown below.

Figure 1. Sustainability Meter

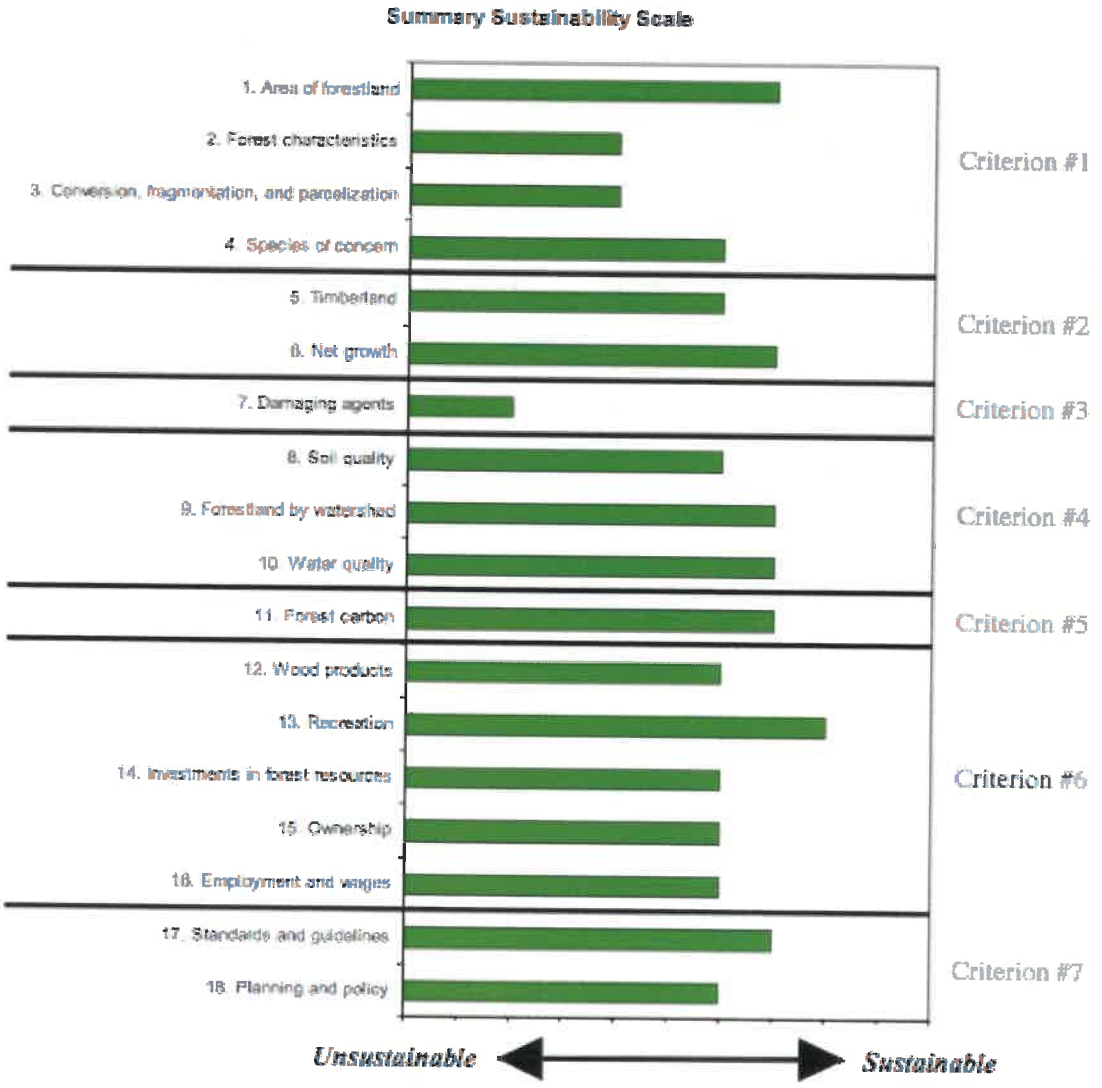


Pennsylvania found that the graphic representation with the arrow pointing into orange where the trend for an indicator was of concern, or green where the trend was positive, was easily understood by the public and a good conversation starter. Jim Grace of Pennsylvania Department of Conservation told us, "the meter got attention, and it was easy to decipher by the stakeholders".

The placement of the needle on the meter was set by Pennsylvania forestry professionals. When there was disagreement on the placement of the needle for an attribute, they said "we would slide the needle over to not alienate people." While the meter has ten tick marks, there are no absolute numbers associated with the meter. Pennsylvania warns that it is important to not try to do this with bad data.

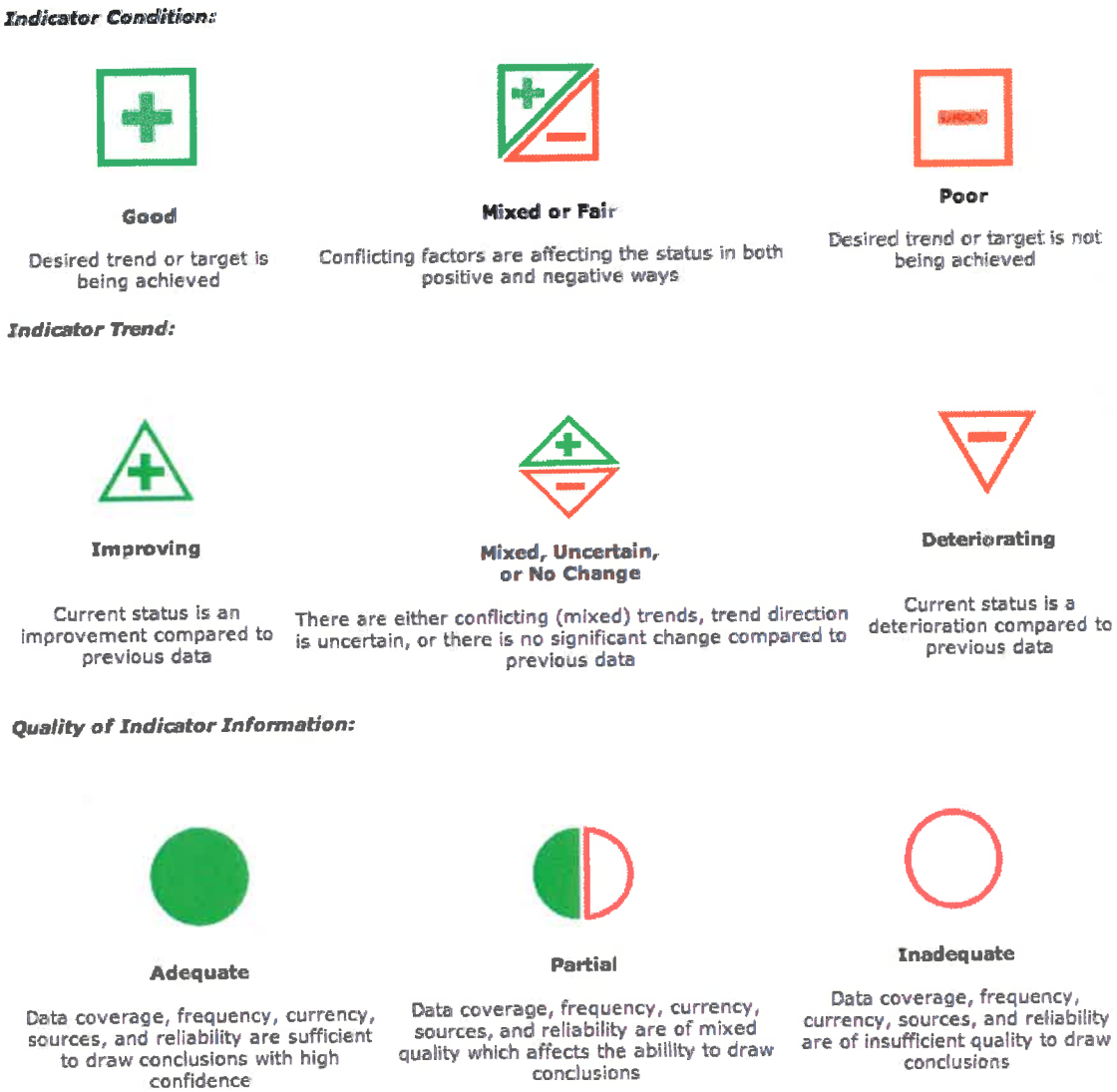
It's very important that the data can support the location of the needle on the meter. Another graphic used in the Pennsylvania Forest Assessment is the Sustainability Scale. This is a linear representation of the indicators on a bar graph, showing relative sustainability of all 18 indicators. The Summary Sustainability Scale is shown below in Figure 2. The bar graph also uses ten tick marks along the horizontal to display relative sustainability, but it does not use the color gradient that was used in the Sustainability Meter. The scale shows the relative strength of the 18 indicators in relation to each other. People looking at the scale might conclude that "damaging agents" are the greatest threats to forest health and sustainability, while the other indicators appear fairly strong.

Figure 2. Pennsylvania Summary Sustainability Scale



Several respondents told us that while the data can give you a sense of trends, either a good trend or a bad trend, the data are not absolute, and does not tell you how fast you are going in either direction. Both the Northeastern Area and Oregon talked about the need to set benchmarks as a way to assess progress. Northeastern Area has been unable to set benchmarks yet, and Oregon is working on it. One respondent said, "If people expect this process to come up with probative evidence, they'd be disappointed. It only gives an indication. It is a tool to say, "We are doing pretty well here, or not so good there"." Oregon uses red and green arrows as their graphic indicator of trends. See figure 3 below.

Figure 3. The Oregon Graphics for Each Indicator



The Oregon graphics include three short-hand evaluations of each indicator. The first graphic shows the condition of the indicator, whether the data shows the

element to be in good condition, mixed or fair condition or poor condition. The second graphic indicates the trend data for the element, whether it is improving, showing no change, or deteriorating. And the third graphic shows the quality of the data used to evaluate the element, whether the data is adequate, partial or inadequate. When the results of the each indicator are reported, there is a graphic at the top of each indicator showing the condition, the trend and the quality of the data.

Sustainability Studies Resources

International C&I Resources

International Roundtable on Sustainable Forests:
http://www.sustainableforests.net/

History of the MPCI:
http://www.sustainableforests.net/docs/Roundtabls%20History%20030905.pdf

The Montreal Process Criteria and Indicators:
http://www.rinya.maff.go.jp/mpci/meetings/an-6.pdf

U.S C&I Resources

Highlights of the Northeastern Area Assessment 2003: Highlights of the NA Assessment: http://www.na.fs.fed.us/sustainability/pubs/sus_assess/03/toc.pdf

Forest Sustainability Assessment for the Northern United States – 2007:
http://www.treesearch.fs.fed.us/pubs/11593

Northeastern Area Association, Sustainability Website:
http://www.na.fs.fed.us/sustainability/

Northeast Area Association Indicators Database: http://apps.fs.fed.us/fsiis/home.do (not available yet)

Northeastern Areas Association Sourcebook:
http://na.fs.fed.us/pubs/sustainability/sourcebook02/criteria_indicators.pdf

Northeastern Area Association, Role of the Forest Service:
http://www.na.fs.fed.us/spfo/pubs/sustain/role/roles.pdf

Northeastern Area Association, Metrics and Data Sources:
http://www.na.fs.fed.us/spfo/pubs/sustain/base_ind/03/base_indicators.pdf

Oregon Sustainable Indicators website:
http://www.oregon.gov/ODF/indicators/index.shtml

Oregon Strategies and Indicators:
http://www.oregon.gov/ODF/RESOURCE_PLANNING/Sustainable_Forest_Indicators_Project.shtml#Indicator_Development_Forestry_Program_for_Oregon_Strategy_A

Oregon Roundtable on Sustainable Forests:
http://www.oregon.gov/ODF/indicators/roundtable.shtml

Draft Forestry Program for Oregon: A Strategy for Sustaining Oregon's Public and Private Forests - 2011
http://www.oregon.gov/ODF/BOARD/docs/Public_Review_Draft_FPFO.pdf
A

The Changing California: Forest and Range 2003 Assessment:
http://frap.cdf.ca.gov/assessment2003/

Draft National Report on Sustainable Forests - 2010:
http://www.fs.fed.us/research/sustain/2010SustainabilityReport/documents/draft2010sustainabilityreport.pdf

National Report on Sustainable Forests – 2003:
http://www.fs.fed.us/research/sustain/2003SustainabilityReport/

State Forest Resource Assessment Resources

State Forest Resource Assessments:
http://www.stateforesters.org/issues_and_policy/forests_in_the_farm_bill

State Forest Resource Assessments Fact Sheet:
http://www.stateforesters.org/files/02032010-State-assessments.pdf

Pennsylvania 2010 State Forest Assessment and Strategy:
http://www.dcnr.state.pa.us/forestry/farmbill/index.html