



# **NAASF Guide for Statewide Forest Resource Assessments**

**Updated May 11, 2009<sup>1</sup>**

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Background—at the request of the Northeastern Area Association of State Foresters (NAASF), this document was developed by the NAASF Forest Resource Planning Committee (FRPC) with staff support from the Northeastern Area State and Private Forestry and with review and input from all NAASF Committees. Individuals on the FRPC State Assessment and Plan Core Team are acknowledged in Appendix C.

There are two accompanying documents:

*NAASF Suggested Framework for Statewide Forest Resource Assessments*

*NAASF & NA Guide for Statewide Forest Resource Strategies*

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<sup>1</sup> The November 2008 version was updated to include additional information about geospatial data in Appendix A.

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## **NAASF Guide for Statewide Forest Resource Assessments and Strategies**

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The Farm Bill<sup>2</sup> requires each state to complete a Statewide Forest Resource Assessment or “State Assessment” and Statewide Forest Resource Strategy or “Resource Strategy” to receive funds under the Cooperative Forestry Assistance Act. State Assessments are intended to identify key forest-related issues and priorities to support development of the long-term Resource Strategy. This document provides an overview of the Farm Bill requirements, S&PF national guidance, and additional regional guidance for the 20 NAASF states and DC. It outlines minimum components for the State Assessment and Resource Strategy; with more details for the State Assessment (future regional efforts may provide more details on the components for the Resource Strategies).

The State Assessment and Resource Strategy should address forest-related issues of importance to the state and should also be linked to the three national themes: (1) conserve working forest landscapes, (2) protect forests from harm, and (3) enhance public benefits from trees and forests. While states are asked to identify landscape areas where national, regional, and state resource issues and priorities converge, there is flexibility for the content and structure of both the State Assessment and Resource Strategy. This flexibility allows each state to use the best data available, work with stakeholders, and adequately consider other state assessments, plans, and priorities as relevant. In this way, the State Assessment can provide a valuable document for communicating forest-related issues, threats, and opportunities in the state and the Resource Strategy can serve as an important strategic document for the state forestry agency for planning and funding purposes (beyond serving to meet Federal funding requirements).

This guide provides (1) an overview of the national requirements and guidance for State Assessments with regional clarification and sideboards, (2) an overview of the national requirements and guidance for the Resource Strategies, (3) guidance on the timeline, approval process, and expected stakeholder involvement, (4) an appendix with more detail on the geospatial data layers. An accompanying regional document provides a suggested framework for State Assessments.

### **Overview of the Statewide Forest Resource Assessment—“State Assessment”**

To ensure that Federal and state resources are being focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve meaningful outcomes, each state and territory will work with key partners and stakeholders to develop a State Assessment. At a minimum, State Assessments will:

- Provide an analysis of present and future forest conditions and trends on all ownerships in the state, including analysis of market and non-market forces.
- Identify threats to forest lands and resources in the state consistent with the national themes
- Identify forest related benefits and services
- Delineate priority forest landscape areas in the state across themes and programs, ownerships, and the urban to rural continuum, to be addressed by the Resource Strategy
- Delineate any multi-State areas that are a regional priority

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<sup>2</sup> The Food, Conservation, and Energy Act of 2008, commonly referred to as the Farm Bill, was enacted June 19, 2008.

## **Analysis of Issues**

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Identifying the key forest-related trends and issues in the state is an important part of the state assessment. Key state issues coupled with consideration of the national themes should be outlined in the State Assessment and then addressed in the Resource Strategy. This foremost focus on important trends and issues provides a foundation for the assessment. The geospatial analysis to identify priority areas should utilize data relevant to the key issues identified for the state.

## **Geospatial Analyses to Identify Priority Landscape Areas**

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State Assessments will include geospatial analyses of all ownerships to identify priority landscape areas across the urban to rural continuum where Federally-funded cooperative forestry program outreach and activity can be emphasized and coordinated. Establishment of these priority areas is intended to enable the efficient, strategic, and focused use of limited US Forest Service program resources. The geospatial analyses are one component of the state assessment and should support the information needed for the assessment (based on issues of importance to the state). The identification of priority areas is important for focusing coordinated Federally-funded US Forest Service efforts where possible and appropriate, but is not intended to replace efforts by state forestry agencies to serve other areas of the state. Priority areas may include non-forested lands, such as grasslands, agricultural lands, and riparian areas, where forestry efforts will produce environmental benefits. As specified in the national guidance, data used in State Assessments should generally be at a scale of 1:100,000 or better and overlay analyses should be conducted at the 30-meter cell size or finer. Include a description of the priority areas and methodology for the geospatial analysis in the State Assessment.

The following core issues or themes are suggested for the geospatial overlay analysis:

- Development Pressure
- Forest Fragmentation & Parcelization
- Wildfire Risk
- Forest Health Risk
- Fish and Wildlife Habitat
- Water Quality & Supply
- Tree Cover in Urban Areas

This list was developed by refining the list of suggested core issues or themes that was originally cited in the national guidance for State Assessments. Two data themes suggested in the national guidance: (1) economic potential and (2) green infrastructure, were deleted from the list due to inadequate and inconsistent data availability across the twenty NA states and the District of Columbia. Economic importance and/or potential should be included in the State Assessment using qualitative and quantitative information available to the state. A green infrastructure data layer may be costly to develop at a state scale, however some data already available can serve as a proxy, e.g., protected areas, existing forest patches, and riparian corridors. The above regional-level list also includes one data theme that was not in the national list: tree cover in urban areas. Appendix A provides more information about the purpose of each data layer, how they relate to data used in the Spatial Analysis Project, and the current state of geospatial data available. The final national guidance for State Assessments references the list of national objectives (see sidebar on page 7) as factors states may want to include geospatial data layers for (this is a suggestion—is not required).

**Approaches for the Geospatial Analyses**—There are several ways a state may conduct geospatial analyses to identify priority forest areas. As stated in the national guidance, “A state’s geospatial assessment can include one or more weighted overlay analyses that delineate priority landscape areas. A state may choose to conduct separate analyses to address specific resource management or

unique program-related questions, or use analyses already completed for individual programs, such as those completed for the Forest Stewardship Spatial Analysis Project.” Here are three example approaches for states to consider for the geospatial analyses to identify priority areas:

### **1. Build on the Forest Stewardship Analysis Project (SAP) and Separate Urban Analysis**

For Rural Lands—build on the Forest Stewardship Spatial Analysis Project (SAP) methodology that used a weighted overlay analysis of 12 core themes, but include the public lands in the area of analysis to identify priority forest areas across ownerships (public to private). Public lands can be incorporated by re-running the geospatial analysis on all ownerships and then overlaying a state-available public lands layer or the Protected Areas Database (PAD) layer. There are some new data sets available and states are encouraged to include data layers as relevant to address state-specific issues and concerns.

For Urban Lands—a two-phased approach to identify priority urban areas. Phase one may be a geospatial overlay analysis at the 30-meter cell size level including data key to the urban and urbanizing landscape (e.g., impervious surfaces, urban tree cover, impaired waters, population density, road density) to identify broad priority urban landscapes across the State. In a second phase, states could then complete a higher resolution analysis to further focus efforts within high priority urban areas that were identified in phase one.

States may consider conducting a separate geospatial analyses for a third landscape position, such as the “intermix” and “interface” classes in the Wildland Urban Interface (WUI) that identifies land in between rural and developed areas.

A final composite of priority rural and phase one urban lands could be displayed together on one map.

### **2. Separate Analysis For Each National Theme**

Conduct a separate geospatial analysis to identify priority areas for each of the national themes: (1) conserve working forest landscapes, (2) protect forests from harm, and (3) enhance public benefits from trees and forests. Identify the data layers that should be included to address the issues for each theme and utilize data from the SAP and other available sources. A composite map could show priority areas for each of the three themes as well as areas with overlapping priority for two or three of the national themes. This is how the S&PF National Assessment is being done.

### **3. State Issue-Based Analyses**

Geospatial analyses based on state issues could be completed in a couple of ways:

- Identify a few key issues in the state and then conduct a geospatial analysis to identify priority areas for each issue (e.g., climate change, fragmentation, etc.).
- Conduct separate geospatial analyses for regions within a state to identify priority areas for each sub-state region. The analysis for each sub-state region would include data layers to support key issues unique to the region.

A composite map could show priority areas across the state.

**Composite map**—the development of a composite map of priority areas is encouraged to facilitate the identification of priority areas across state boundaries. Priority areas can be displayed in different ways on the composite map (and for different objectives depending upon the state’s issues and priorities):

- As one single class of priority areas (all priority areas displayed equally)

- As high, medium, or low priority areas
- By type of priority (defined by issue, i.e. biological diversity, loss of open space, threats to forest health)
- Long-term versus short-term priority areas

A state can take the composite map and then overlay other layers depicting boundaries of areas of interest such as Wildland Urban Interface (WUI), political jurisdictions, watersheds, or ecological units to identify opportunities for cooperation and collaboration across programs and agencies. This use of GIS as a tool can be helpful for identifying the short and long-term actions and stakeholders to work with, which can then be outlined in the Resource Strategy.

**Non-Geospatial Data and Analysis to Identify Priority Landscape Areas**—it is expected that states will have information critical to forest resource conditions and trends which can not be adequately shown geospatially. In addition to the suggested geospatial themes, states should consider other information available for environmental, social, and economic factors related to forest resources. A combination of qualitative and quantitative information should be used to identify key issues and the geospatial analysis should support data needed for identifying related priority areas. Non-geospatial information can be used in combination with the geospatial information to identify priority areas, for example, work with a particular group of stakeholders in one area of the state could be included in the map of priority areas.

### **Other Considerations**

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As described above, states should include a combination of qualitative, quantitative, and geospatial information to assess a range of important forest related environmental, social, and economic values and issues. This may include, but is not limited to, the economic importance of forests, climate change, cultural resources, private forest landowner demographics, the demand for outdoor recreational facilities, and issues in more urban areas such as social equity. Some of these important factors and range of qualitative, quantitative, and geospatial data are described below.

**Economic Importance**—there is a lack of consistent, high resolution geospatial data available to adequately address the economic importance or potential of forests (see Appendix A). Additionally, the type of economic importance or potential of forests differ across states. Given this, states should be allowed to define how to best address the economic importance and potential of forests for their state, but the critical economic dimension must be included in State Assessments. For example, State Assessments may consider the economic importance and potential of forest products and related markets, non-timber forest products, forest-related tourism, and/or woody biomass for energy and bio-products.

**Climate Change**—State Assessments should identify potential effects of climate change on forests and highlight opportunities that forests and forest management can play to help mitigate climate change. Some related data are available from the Northern Research Station for woody biomass based on FIA timberland (<http://svinetfc4.fs.fed.us/rastergateway/biomass/>) and carbon sequestration (GTR-NRS-18 Measurement Guidelines for the Sequestration of Forest Carbon; 1605b Forest Tables). In response to this issue, the Resource Strategy may address forest management techniques for adapting to climate change and should highlight actions for mitigation (using woody biomass for energy, development of markets for carbon offsets, wood product substitution, cooling urban heat islands, etc.).

**The Role of Urban Jurisdictions across the Landscape**—most priority forest landscape areas in the Northeast and Midwest will have a significant human presence that should be considered an important component of the State Assessments and Strategies. Several robust datasets do exist at the 30-meter (and finer) scale that can help to inform any process of prioritization. Beyond the census urban area definition, which primarily considers population density and built-up impervious area, most political jurisdictions contain a great amount of rural forest land. For instance, an overlay of census-defined urban counties and the Spatial Analysis Project layer of Stewardship Program potential, showed that one third of the acres of high stewardship potential fall within these counties. Interest and capacity of adjacent urban centers to protect working forest land may be an important factor contributing to priority landscape selection and strategies for efforts across these lands.

## Framework for State Assessments

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An accompanying regional document provides a suggested framework for State Assessments (see side bar for the table of contents). States may organize their State Assessment differently than outlined below. NAASF and NA have worked collaboratively over the past several years to assess and support forest sustainability at regional and state levels following agreed upon criteria and indicators. The criteria, which are used at national and international levels, provide broad categories or goals for sustainable forest management. The eighteen NAASF/NA base indicators of forest sustainability are organized to measure the seven criteria and assess forest conditions. Building on this work and related data available, the “forest conditions and trends” chapter in the framework is organized according to the seven criteria of forest sustainability.

### Suggested Table of Contents for State Assessments

1. Introduction
2. Forest Conditions and Trends
3. Existing and Emerging Benefits and Services
4. Issues, Threats, and Opportunities
5. Priority Forest Areas
6. Summary
7. Appendices: References, Methodology for Geospatial Analyses, Data gaps

## Data Available

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States should draw from existing data sources and assessments, including data available from the Forest Stewardship Spatial Analysis Project (SAP); Forest Legacy Assessments of Need; Forest, Water, and People Assessment; Urban Tree Cover analyses; Forests on the Edge; National Insect and Disease Risk Map project (NIDRM); State Wildlife Action Plans; and the National S&PF Assessment, as relevant. Some known data sources are outlined in Appendix A. In addition, the NA GIS Team will provide links to known national and regional geospatial data that are appropriate for State Assessments. There are also trend data and some projections available as part of the US Forest Service Resources Planning Act (RPA) reports. In addition, a wealth of state-level trend data for the NAASF/NA base indicators of forest sustainability (primarily non-geospatial) will soon be readily available through an on-line indicators information system (or these data can be provided directly if the system is substantially delayed further). A list of the metrics included in that system are provided for reference in Appendix B.

## Data Gaps

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States should identify information gaps as part of their assessment process. These geospatial and other information gaps will help focus future data development work at local, state, regional, and national levels.

## Overview of the Statewide Forest Resource Strategy—“Resource Strategy”<sup>3</sup>

The Resource Strategy provides a long-term, comprehensive, coordinated strategy for investing state, federal, and leveraged partner resources to address the management and landscape priorities identified in the State Assessment. Resource Strategies provide a basis for future program, agency, and partner coordination. At a minimum, the Resource Strategies should:

- Outline long-term strategies for addressing issues, threats, and priority areas identified in the State Assessment and national themes and objectives (see sidebar) and can include desired conditions
- Include a long-term timeline for project and program implementation
- Describe how the state proposes to invest Federal funding, along with other resources, to address state, regional, and national forest management priorities
- Identify partner and stakeholder involvement
- Incorporate other existing statewide forest management plans, including the state wildlife action plan and community wildfire protection plans
- Describe how S&PF programs will be used to address priority landscape and management objectives, fulfilling existing S&PF program planning requirements.
- Describe how the state’s proposed activities will accomplish national S&PF program objectives and respond to specified performance measures and indicators.
- Identify strategies for monitoring outcomes within priority forest areas and how action will be revised when needed.

### National Themes and Objectives

#### Conserve Working Forest Landscapes

- Identify and conserve high priority forest ecosystems and landscapes
- Actively and sustainably manage forests

#### Protect Forests from Harm

- Restore fire-adapted lands and reduce risk of wildfire impacts
- Identify, manage, and reduce threats to forest and ecosystem health

#### Enhance Public Benefits from Trees and Forests

- Protect and enhance water quality and quantity
- Improve air quality and conserve energy
- Assist communities in planning for and reducing wildfire risks
- Maintain and enhance the economic benefits and values of trees and forests
- Protect, conserve, and enhance wildlife and fish habitat
- Connect people to trees and forests, and engage them in environmental stewardship activities
- Manage and restore trees and forests to mitigate and adapt to global climate change

## Annual Strategy and Actions

While the long-term strategies for addressing priority landscapes and issues are provided in the Resource Strategy, specific strategies and actions to be taken within a given fiscal year will be outlined in the annual grant proposal, narrative, and funding request for all S&PF programs that are eligible to receive funding under a consolidated grant option (for both competitive and base program funding). The annual strategy describes specific actions under each program and across programs to address the State Assessment and Resource Strategy. This will be required for states that are requesting S&PF program funding for any given fiscal year, beginning in Federal FY 2011.

<sup>3</sup> This document focuses primarily on the State Assessment and is to be followed by an effort to outline components for the Resource Strategy.

## **Timeline for Initial Development and Updates**

The Farm Bill requires each state to complete a State Assessment and Resource Strategy within two years after enactment to receive funds under the Cooperative Forestry Assistance Act. Therefore, State Assessments and Resource Strategies are to be completed by June 2010. State Assessments and Resource Strategies shall be reviewed and updated at least every five years (specified in the national guidance) or as deemed necessary by the Secretary of Agriculture. Annual strategies (in the annual grant narrative) and associated budgets must be developed every year for which S&PF funding is requested.

## **Approval Process**

Under the Farm Bill, State Assessments and Resource Strategies will be approved by the State Forester and then by the Secretary of Agriculture. In states where the lead agency for the Forest Legacy Program is not the state forestry agency, the state lead agency shall concur on all aspects of assessments and resource strategies that pertain to the Forest Legacy Program, including the identification of Forest Legacy Areas. If the State Assessment incorporates a state's Forest Legacy Assessment of Need, the approval process also incorporates that which is required for the Forest Legacy Program.

## **Level of Stakeholder Involvement**

State forestry agencies should consult with key stakeholders to ensure that State Assessments and Response Plans (1) integrate, build upon, and complement other state natural resource assessments and plans and (2) identify opportunities for program coordination and integration. If available, States may do this by working with an established forest advisory council representing a range of forestry stakeholders in the state. The Farm Bill requires coordination with the State Forest Stewardship Committee, state wildlife agency, State Technical Committee, applicable Federal land management agencies, and the lead state agency for the Forest Legacy Program (where the lead agency is not the state forestry agency). The Forest Legacy Program section of the Resource Strategy should be developed by the state lead agency and include all program-specific requirements. Beyond these requirements, each state has flexibility to decide which stakeholders to work with, and to what extent, in development of the State Assessments and Response Plans.

Example key stakeholders that might be consulted include:

- | <b>Forestry Groups</b>   | <b>Governmental Departments/Groups</b>  | <b>Non-Government and Non-Profit Organizations</b>  |
|--|---|---|
| <ul style="list-style-type: none"><li>• Forest Stewardship Committee</li><li>• Urban Forestry Council</li><li>• Forest landowner assoc.</li><li>• Forest products assoc.</li><li>• Private consulting foresters</li><li>• Forestry Departments at State University</li></ul> | <ul style="list-style-type: none"><li>• State Fish and Wildlife</li><li>• State Land Use Planning</li><li>• State Agriculture</li><li>• State Community and Economic Development</li><li>• Federal land managers</li><li>• Local Gov't Association</li><li>• Tribes</li></ul> | <ul style="list-style-type: none"><li>• The Nature Conservancy</li><li>• The Audubon Society</li><li>• National Wild Turkey Federation</li><li>• Ducks Unlimited</li><li>• Ruffed Grouse Society</li><li>• Outdoor recreation orgs.</li></ul> |

## **Sufficiency for Current S&PF Assessment and Planning Requirements**

The Farm Bill cites that the State Assessment and Resource Strategy “shall be deemed sufficient to satisfy all relevant State planning and assessment requirements under this Act.” The intent is for the

Resource Strategy to contain and replace the required S&PF Program planning requirements, such as the state Stewardship Program Plan and the state Urban and Community Forestry Plan. State Assessments can also help guide state Forest Legacy programs in setting land conservation priorities as well as suggesting important issues that should be addressed in the Forest Legacy conservation easements (e.g., alternative energy production siting).

## **S&PF Redesign Performance Measures**

As part of the “Demonstrating and Communicating Results” component of S&PF Redesign, a proposed set of outcome-oriented performance measures, organized by 10 desired outcomes, were drafted. These measures are still under development but are envisioned to provide a mechanism for reporting accomplishments achieved with S&PF funding. Implementation of these Redesign performance measures is tentatively targeted for FY 2010. The accomplishments reported by states will be communicated through an Annual Report Card and other media.

The State Assessment may provide information relevant to the Redesign Performance Measures, however, the Redesign Performance Measures should not be used as the sole framework for the State Assessment because they are not a comprehensive set of important factors to consider (and may not adequately address state issues) and they are in a state of flux (likely to be modified over the next few years and the State Assessment is a long-term document).

## **National Assessment**

S&PF is conducting a national assessment of conditions, trends and opportunities on forest lands:

- Intended to inform S&PF policy, planning, and programming at the national level.
- To highlight conditions and trends of national significance and identify opportunities for multi-state and multi-agency investment and cooperation.
- To communicate the importance of state and private forest landscapes and their relationship to our National Forests and Grasslands and other public lands.

The national assessment is being designed as a flexible web-based GIS tool capable of supporting analysis of customized data sets at national, regional, and state levels. At the national level, it will be used, along with the national themes, to establish broad scale priorities for investment of S&PF funding and resources. Ultimately, the decision support system that produces the assessment will be developed into an interactive resource that can also be used at the regional and state levels (to view and download national and regional datasets and upload and view state datasets). This National Assessment system will eventually incorporate a spatial accomplishment tracking system (which may utilize the WebDET tool developed for Forest Stewardship, to enable spatial tracking of all S&PF program accomplishments).

## **Appendix A. Core Themes/Layers Proposed for the Geospatial Component of State Assessments, Relevant SAP Data Layers, and Current State of Geospatial Data Available for Suggested Data Themes**

### **Development Pressure**

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**Purpose:** The Development, or development probability, data theme is intended to emphasize areas that are projected to experience increased housing development in the next 30 years. Policies that encourage and support conservation, protection, or active management of private forest lands can improve the likelihood that these lands will remain forested and continue to provide forest values such as timber, wildlife habitat, and water quality, and recreation.

**Relevant SAP Data Layer:** Threat of Development (likelihood of development)

**Data source used for SAP data layer:** Nationally available data layer–Housing Density Projections (D. Theobald, Colorado State University). Data sets developed by Dave Theobald were used by most states in the SAP. 2000 housing densities were subtracted from 2030 housing density projections to define areas under development pressure.

**Current state of geospatial data available:** Same, however the USFS has provided funding to the Conservation Biology Institute to update the Protected Areas Database (PAD), and Theobald has expressed interest in re-running his Housing Density models, incorporating these new data when available.

### **Forest Fragmentation and Parcelization**

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**Purpose:** The Forest Fragmentation and Parcelization data theme is intended to emphasize areas where fragmentation, parcelization, and related human activity makes a forest area more susceptible to several risk factors such as insect pests and disease and where parcelization also poses challenges for forest management, e.g., reduced economic viability of active forest management.

**Relevant SAP Data Layer:** None, although “Threat of Development” and “Forest Patches” could be considered proxies.

**Data source used for SAP data layer:** Nationally available “Classification of Forest Fragmentation of North America” data produced by Riitters in 2002 (available at <http://nationalatlas.gov/mld/forfrgi.html>). States might also use Forest Patch Size with the Development Risk layer (these layers are included in all State SAP assessments) to represent Forest Fragmentation.

**Current state of geospatial data available:** NRS FIA has generated some “urbanization, fragmentation, and context characteristics of forestland” for the 20 Northeast and Midwest states including forest by housing density, forest by population density, forest patch size, and forestland by distance to roads.

### **Wildfire Risk**

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**Purpose:** The Wildfire Risk data theme is intended to identify areas where planning and management are likely to reduce a relatively high risk of wildfire.

**Relevant SAP Data Layer:** Wildfire Risk

**Data source used for SAP data layer:** States provided and defined this data layer.

**Current state of geospatial data available:** In SAP, states provided and defined this data layer. A national effort called Landfire will create a series of data layers that could be used in the creation of a fire risk map (<http://www.landfire.gov/>). Data sets for the northeast will be completed in 2008.

## **Forest Health Risk**

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**Purpose:** The Forest Health data theme is intended to place importance on areas where silvicultural treatments can address pressing risks to forest health.

**Relevant SAP Data Layer:** Forest Health

**Data source used for SAP data layer:** Most states used multiple years of aerial detection survey data to identify areas with recurring or chronic forest health issues, and then chose to emphasize either the areas with health concerns or the inverse (healthy forests). Some states used the nationally available forest health risk data layer developed by the U.S. Forest Service's Forest Health Technology Enterprise Team (1 km grid of mortality risk).

**Current state of geospatial data available:** Tentative plans are underway to develop a 30 meter resolution version of the National Risk Map by 2011, led by the Forest Health Technology Enterprise Team. In the mean time, states can use the layer they included in SAP.

## **Fish and Wildlife Habitat**

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**Purpose:** The Fish and Wildlife Habitat data theme is intended to identify important plant communities that provide habitat for valued fish and wildlife species, including, but not limited to, threatened and endangered species.

**Relevant SAP Data Layer:** Threatened & Endangered Species

**Data source used for SAP data layer:** Most states had access to and used T&E habitat data from their state natural heritage program.

**Current state of geospatial data available:** States should have data available through their state natural heritage programs, as reported to NatureServe (the national data source). At a minimum, each state has access to precise spatial representation polygons for T&E species occurrence.

Some states now have geospatial data as a result of their state Wildlife Action Plan effort. The National Association of F&W Agencies has contracted NatureServe to develop a habitat map for the 13 Northeast states. They are developing the methodology this year—we should look into potentially adding on to this effort so we can have a consistent product across all 20 states.

## **Water Quality and Supply**

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**Purpose:** The Water Quality and Supply data theme is intended to place emphasis on landscapes that impact long-term watershed function in supplying clean and adequate public water supplies, including watersheds that drain into public drinking water supply intake points. Priority watersheds can be either those that are impaired or deforested, but could be measurably improved through planning and active management, or those that are currently productive, but somehow threatened.

**Relevant SAP Data Layers:** Priority Watersheds, Public Water Supplies, Riparian Corridors

**Data source used for SAP data layer:** For SAP, states defined and provided all three of these data layers: (1) public water supplies, (2) priority watersheds, and (3) riparian corridors. The Public Water Supplies layer was developed by buffering municipal water supply intake points or areas.

The protected nature of those intake points data make it somewhat difficult to obtain/share. For the Priority Watersheds layer, the EPA Unified Watershed Assessment (UWA) from the late 1990's was commonly used in SAP. The Riparian Corridors dataset was created by buffering perennial rivers and streams (typically by 300' on each side of the feature) and intermittent streams (typically by 100' on each side of the feature).

**Current state of geospatial data available:** All states developed Priority Watershed, Public Water Supplies, and Riparian Corridor layers through SAP that are intended to address aspects of water quality and supply. NA has also developed an "ability to produce clean water" index (Forest Water and People effort) based on 8-digit Hydrologic Unit Codes (HUC) and 1992 NLCD data ([http://www.na.fs.fed.us/watershed/fwp\\_preview.shtm](http://www.na.fs.fed.us/watershed/fwp_preview.shtm)). This could be re-run with 2001 NLCD data and with other newer data as available/appropriate (roads, housing density). NA could give states the data and the states can average the values for watersheds.

## **Tree Cover in Urban Areas**

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**Purpose:** The Tree Cover in Urban Areas data theme is intended to provide data important to identification of broad priority urban areas with greatest opportunity to enhance the benefits provided by trees and forests, and to influence the conservation and protection of adjacent working forest landscapes. As outlined in the first approach for the geospatial analysis in this guide, a separate analysis for urban lands may be conducted in two-phases. Phase one (see sidebar) is a geospatial overlay analysis including data key to the urban landscape (e.g., impervious surfaces, urban tree cover, population density, water quality) to identify broad priority urban areas across the State, and their relative juxtaposition to adjacent priority forests. In a second phase, states could then conduct a higher resolution analysis to further focus efforts (perhaps to the parcel level) within those urban areas that were identified in phase one.

**Relevant SAP Data Layer:** Forest Patch Size, Priority Watersheds, Riparian Corridors, and priority lands for stewardship in metropolitan counties

**Current state of geospatial data available:** Urban RPA data are available from the Northern Research Station for political boundaries, tree cover, impervious surface, population, and priority planting index. Data for community capacity for urban forestry efforts are available from the S&PF Community Accomplishment and Reporting System (CARS). NAIP high-resolution data are available leaf-on to support phase II analysis. Additional data layers are being evaluated by an NAASF Urban Geospatial Work Group and will be added here as available.

## **Biomass/Carbon (The National Biomass and Carbon Dataset 2000 (NBCD 2000) - Woods Hole Research Center)**

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**Purpose:** Scientists at the Woods Hole Research Center are producing a high-resolution "National Biomass and Carbon Dataset for the year 2000" (NBCD2000), the first ever spatially explicit inventory of its kind. The dataset is being produced as part of a project funded under NASA's Terrestrial Ecology Program with additional support from the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE). The primary objective of the project is to generate a high-resolution (30 m), year-2000 baseline estimate of basal area-weighted canopy height, aboveground live dry biomass, and standing carbon stock for the conterminous United States.

**Relevant SAP Data Layer:** None

**Current state of geospatial data available:** Available nation-wide for download by NLCD mapping zone at <http://www.whrc.org/nbcd/>.

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The following two data themes were suggested in the national guidance, but were deleted from the “suggested” set in this regional guidance document due to inadequate data availability. The purpose statements from the national guidance and notes on data availability are provided for reference:

### **Economic Potential (deleted from regional “suggested layers” list)**

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**Purpose (from national guidance):** The Economic Potential data theme is intended to place emphasis on areas where forests do or could potentially play a major role in local or state economic growth or contribute to the development of emerging markets such as biomass energy or ecosystem services.

**Notes:** Slope was derived from the USGS 30-meter Digital Elevation Model (DEM) and was used as proxy for site productivity and operability in SAP. Site index are also nationally available from the NRCS Soil Survey Geographic database (SSURGO). This focus on timber harvesting as the only economic benefit derived from forests is too limiting. RPA data on growth and removals are available by county from the Timber Products Output database, although there are some concerns with these data (e.g., missing mills). Data available, or even appropriate to address this theme will vary from state to state depending on opportunities for growth in markets/businesses. Economic importance and/or potential should be included in the State Assessment using qualitative and quantitative information available to the state (states can define how to best address the economic importance of forests).

### **Green Infrastructure (deleted from regional “suggested layers” list)**

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**Purpose (from national guidance):** The Green Infrastructure data theme is intended to emphasize opportunities for an interconnected green space network that includes natural areas and features, public and private conservation lands, working lands with conservation values, and other protected open spaces that are planned and managed for natural resource values and for associated benefits to human population. The layer could create an opportunity to influence local planning to maintain a network of open spaces and forested corridors. The data layer could also function to identify areas representing a high potential for “re-greening.”

**Notes:** States that have a green infrastructure analysis already available can use it, however, development of this layer is time consuming and expensive (not feasible with time constraint and resources available). Although this one was deleted from the regional “suggested layers” list, some data already available in the state SAP can serve as a proxy for this one, e.g., proximity to protected areas and forest patches. In addition, it is recommended that data important for identification of priority urban areas be included in the State Assessment (see Tree Cover in Urban Areas section above). For reference, the State of Maryland has done work to define a Green Infrastructure data layer (<http://www.dnr.state.md.us/greenways/gi/gi.html>), as has the State of Virginia ([http://www.dcr.virginia.gov/natural\\_heritage/vclnagrns.html](http://www.dcr.virginia.gov/natural_heritage/vclnagrns.html)).

## **Appendix B. NAASF/NA Base Indicators (and Metrics) of Forest Sustainability <sup>1</sup>**

These indicators and metrics span the Montreal Process criteria and are recommended for use in NA-wide and State forest assessments. Trend data for each metric will be provided on the NA Forest Sustainability Indicators Information System (<http://na.fs.fed.us/sustainability>).

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### **Criterion 1. Conservation of Biological Diversity**

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#### **1. Area of total land, forest land, and reserved forest land**

- 1.1 Forest and total land area
- 1.2 Forest density
- 1.3 Forest land and population
- 1.4 Reserved forest land
- 1.5 Urban forest

#### **2. Forest type, size class, age class, and successional stage**

- 2.1 Forest cover type groups
- 2.2 Size class
- 2.3 Age group
- Successional stage (*text document; no data/graphs*)

#### **3. Extent of forest land conversion, fragmentation, and parcelization**

- 3.1 Fragmentation (*text report with links; no data/graphs*)
- 3.2 Forest land developed
- 3.3 Net change in forest land
- 3.4 Additions to and conversions from forest land
- 3.5 Forest parcel sizes

#### **4. Status of forest/woodland communities and associated species of concern**

- 4.1 Forest and woodland communities
- 4.2 Forest-associated and all species
- 4.3 Forest-associated species of concern by taxonomic group
- 4.4 Bird populations

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### **Criterion 2. Maintenance of Productive Capacity of Forest Ecosystems**

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#### **5. Area of timberland**

- 5.1 Amount of timberland

#### **6. Annual removal of merchantable wood volume compared with net growth**

- 6.1 Net growth and removals
- 6.2 Type of removals

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### **Criterion 3. Maintenance of Forest Ecosystem Health and Vitality**

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#### **7. Area of forest land affected by potentially damaging agents**

- 7.1 Tree mortality and damage type
- 7.2 Wildfire
- 7.3 Drought
- 7.4 Insects, diseases, plants, and animals

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**Criterion 4. Conservation and Maintenance of Soil and Water Resources**

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**8. Soil quality on forest land**

- 8.1 Soil pH
- 8.2 Total soil carbon
- 8.3 Estimated bare soil
- 8.4 Bulk density
- 8.5 Calcium-aluminum ratio

**9. Area of forest land adjacent to surface water, and forest land by watershed**

- 9.1 Forested riparian area
- 9.2 Forest land by watershed

**10. Water quality in forested areas**

- 10.1 Water quality in forested areas (*text report with links, no data/graphs*)
- 10.2 Stream miles impaired by percentage of watershed forested

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**Criterion 5. Maintenance of Forest Contribution to Global Carbon Cycles**

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

- 11.1 Forest ecosystem biomass
- 11.2 Forest carbon pools
- 11.3 Forest carbon by forest type
- 11.4 Change in forest carbon

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**Criterion 6. Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies**

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**12. Wood and wood products production, consumption, and trade**

- 12.1 Value of wood-related products
- 12.2 Production of roundwood
- 12.3 Production and consumption of roundwood equivalent
- 12.4 Recovered paper
- 12.5 Bioenergy (*text report with links; no data/graphs*)
  - Trade or wood flow (*text document; no data/graphs*)
  - Nontimber forest products (*text document; no data/graphs*)

**13. Outdoor recreational participation and facilities**

- 13.1 Participation in outdoor recreation
- 13.2 Federal land open to recreation
- 13.3 Recreational facilities on State land
- 13.4 Trails
- 13.5 Campgrounds
- 13.6 Recreational facilities in national forests

**14. Investments in forest health, management, research, and wood processing**

- 14.1 USDA Forest Service Northeastern Area State and Private Forestry funding
- 14.2 State forestry agency funding
- 14.3 Funding for forestry research at universities
- 14.4 USDA Forest Service Research funding
- 14.5 Capital expenditures by manufacturers of wood-related products

**15. Forest ownership, land use, and specially designated areas**

- 15.1 Forest land ownership
- 15.2 State lands
- 15.3 Protected land
- 15.4 Private land with public conservation easements
- 15.5 Forest land in tax reduction programs
- 15.6 Forest certification

**16. Employment and wages in forest-related sectors**

- 16.1 Wood-related products manufacturing employees
- 16.2 State forestry employees
- 16.3 USDA Forest Service employees
- 16.4 Wood-related products manufacturing payroll and wages
- 16.5 State forestry salaries

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

**17. Forest management standards/guidelines**

- 17.1 Types of forest management standards/guidelines
- 17.2 Voluntary and mandatory standards/guidelines
- 17.3 Monitoring of standards/guidelines

**18. Forest-related planning, assessment, policy, and law**

- 18.1 State forest planning
- 18.2 Nonindustrial private forest planning
- 18.3 National forest planning
- 18.4 State forest assessments
- 18.5 Forest laws and policies
- 18.6 State forest advisory committees

<sup>1</sup> No priority is implied in the numeric listing of the criteria, indicators, and metrics.

## **Appendix C. Acknowledgement**

Acknowledgement for the development of this document and the accompanying *NAASF Suggested Framework for Statewide Forest Resource Assessments* goes to the NAASF Forest Resource Planning Committee (FRPC), State Forest Resource Assessment and Plan Core Team members listed below.

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