

Oregon Framework for State Forest Resource Assessments

This document provides a suggested framework for Oregon's State Forest Resource Assessment. The seven forest sustainability goals of the *Forestry Program for Oregon* are used because: (1) they provide broad goals for sustainable forest management, encompassing ecological, social, and economic aspects of forests; (2) they are agreed to and monitored at multiple scales (international, national, regional, in some states, and finer), (3) the State of Oregon has adapted the Montreal Process criteria and indicators into state-level strategic forest policies and technical assessments. Concurrent with the state assessment, Oregon will report the status and trends of Oregon's forest resources using 19 Oregon Indicators of Sustainable Forest Management. Our goal is to integrate the state forest resource assessments and Oregon's indicators in a complementary manner.

The Farm Bill and national guidance calls for the State Assessments and Strategies to be consistent with the three national State and Private Forestry Program (S&PF) themes: (1) conserve working forest landscapes, (2) protect forests from harm, and (3) enhance public benefits from trees and forests. Oregon will demonstrate how state issues and priorities are related to the national themes in the State Assessment. This connection to the national themes is particularly important for the separately produced Resource Strategy.

Oregon's state forest resource assessment will identify, describe, and spatially define forest landscape areas where forestry program outreach and activity will be emphasized and coordinated. Establishment of these priority areas is intended to (1) enable the efficient, strategic, and focused use of limited program resources; (2) address current state and national resource management priorities; and (3) produce the most benefit in terms of critical forest resource values and public benefits. This component of Oregon's assessment will be geospatially based.

Chapter 5 of the framework is focused on the analysis to identify priority forest areas. Throughout the forest conditions and trends sections, each suggested geospatial data theme, along with other potential geospatial data, is referenced where it may be included as a separate map.

The geospatial analysis to delineate priority forest landscape areas will include at least one data layer that addresses each of the following core issues:

- Development Risk
- Fragmentation
- Wildfire Risk
- Forest Health Risk
- Fish and Wildlife Habitat
- Water Quality & Supply
- Urban Trees and Forest
- Economic Potential
- Green Infrastructure

Oregon will draw from existing data sources and layers, including those provided by the National Assessment or developed for the Forest Stewardship Spatial Analysis Project, regional forest resource assessments, Forest Legacy Assessments of Need, and the Oregon Wildlife Conservation Strategy as technically valid and appropriate. Oregon's geospatial assessment may include one or more weighted overlay analyses resulting in a composite dataset that delineates priority landscape areas. Oregon 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.

In order to facilitate inter-state and multi-state analyses and data summaries, data used in Oregon assessment will be at a scale of 1:100,000 or better and overlay analyses will be conducted at the 30-meter cell size or finer. Oregon's forest resource assessment will include a description of all spatial analysis methods and logic and one or more maps that identify priority forest landscape areas. Oregon will identify information gaps as part of its assessment process. These geospatial information gaps will help focus future data development work at regional and national levels.

The **DEVELOPMENT RISK** data layer theme is intended to emphasize areas that are projected to experience increased housing development in the next 30 years. State and private forestry projects and activities can improve the likelihood that these lands will remain forested *and* continue to provide forest values such as timber, wildlife habitat, and water quality. This layer is particularly important in the wildland-urban interface.

The **FOREST FRAGMENTATION AND PARCELIZATION** data layer 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.

The **WILDFIRE RISK** data layer theme will identify areas where planning and management are likely to reduce a relatively high risk of wildfire.

The **FOREST HEALTH RISK** data layer theme is intended to place importance on areas where significant risks to forest health can most likely be addressed through appropriate planning and management activities, or where catastrophic and widespread loss of forest cover is expected and should be addressed through gene conservation efforts.

The **FISH AND WILDLIFE HABITAT** data layer theme is intended to identify areas that provide habitat for valued fish and wildlife species, including, but not limited to, threatened and endangered species.

The **WATER QUALITY AND SUPPLY** data layer 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.

The **URBAN TREES AND FOREST** data layer theme is intended to provide data important to identification of broad priority urban areas. The geospatial analysis may include a data key to the urban landscape (e.g., impervious surfaces, urban tree cover, air quality, population, and forest harvesting and markets infrastructure) to identify broad priority urban areas across the State.

The **ECONOMICAL POTENTIAL** data layer theme is intended to highlight 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.

The **GREEN INFRASTRUCTURE** data layer 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 datalayer could also function to identify areas representing a high potential for “re-greening”.

The following **FOUNDATION (underlying) DATA LAYERS** are likely components of the composite core layers listed above, and thus will also be integrated into Oregon’s assessment:

Foundation Data Layer	Applicable Core Layer Themes
Surface water features	Water Quality and Supply
Forest Cover	Broadly applicable
Ownerships (public, private, tribal)	Broadly applicable
Protected lands	Broadly applicable
Priority Watersheds	Water Quality and Supply
Impervious surface	Green Infrastructure, Development Risk, Water Quality and Supply
Canopy cover	Green Infrastructure, Development Risk, Water Quality and Supply
Wildland-urban interface	Wildfire Risk, Forest Health Risk, Development Risk

Oregon also has important information critical to assessing forest resource conditions, trends, and benefits that is not available geospatially. In addition to the core issues listed above, this section may consider other environmental and social factors as appropriate—such as cultural resources, demographic opportunities, poverty, public health, crime, recreation, and air quality.

Suggested Table of Contents for the Oregon State Forest Resource Assessment

- 1. Introduction**
- 2. Forest Conditions and Trends**—analysis of present and future forest conditions and trends on all ownerships in the state, including analysis of market and non-market forces. Qualitative, quantitative, and geospatial data can be used. This may be organized by the seven goals of the *Forestry Program for Oregon*.
- 3. Existing and Emerging Benefits and Services**—highlight the benefits and services of forests and trees, including ecosystem services.
- 4. Issues, Threats, and Opportunities**—considering the analysis in the above two sections, outline the key forest-related issues, threats, and opportunities in the state.
- 5. Priority Forest Areas**—description of the priority areas in the state, spanning ownerships and the urban to rural continuum, identified as a result of the geospatial analyses, non-geospatial data, and qualitative inputs. Include multi-state areas that are a regional priority.
- 6. Summary**—highlight and summarize key issues, threats, opportunities, and resulting priorities; including priority landscape areas identified as part of the geospatial assessment and priorities that are not illustrated geospatially.
- 7. Appendices: References, Methodology for geospatial analysis, Data gaps**

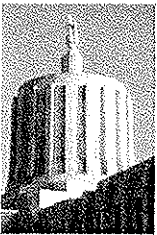
Suggested Framework for State Assessments

1. Introduction

2. Forest Conditions and Trends

Analysis of present and future forest conditions and trends on all ownerships in the state, including analysis of market and non-market forces. Qualitative, quantitative, and geospatial data can be used. This may be organized by the seven goals of the *Forestry Program for Oregon*, as shown below.

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



Importance: Social, legal, economic, and environmental conditions reflect society's values and have a profound effect on forest conservation and sustainable management. These factors create a complex web of influences that can sometimes interact in unexpected ways.

The most important question to answer is, Do the region's legal, institutional, and social factors, when taken together, tend to support or undermine urban and rural forest sustainability? Some of the important factors to consider in the assessment include forestry education, forestry research, employment of national resource professionals, family forest landowner training, and state and national laws and regulations.

Present and future conditions and trends in the legal, institution, and economic framework related to forests:

Related Geospatial Data Layers

- Forest Ownership
- Oregon Counties
- Proximity to Public Forestland

Ties to all three national themes

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **A.a. Ability to measure and report on all other Oregon sustainable forest management indicators**

Metrics:

- For each indicator, a description of the data coverage, data frequency, data currency, data source, data reliability, and references
- A matrix that rates data coverage, currency, frequency, and reliability for each indicator against predetermined evaluation criteria

- **A.b. Development and maintenance of sustainable forest management knowledge**

Metrics:

- Student participation in K-12 forest education programs with a field component
- Number of Oregon public university and community college resident faculty engaged in forest resource instruction and forestry extension (FTE)
- Expenditures on forest resource research
- Number of Oregon members of natural resource professional societies
- Number of Oregon family forest landowners obtaining Master Woodland Manager status or similar advanced management training
- **A.c. Compliance with forestry regulations**
 - Metrics:
 - Number of Oregon Forest Practices Act notifications of operations received from private forestlands by type of activity
 - Percent of inspected private commercial forest operations that are in compliance with the Forest Practices Act by rule category, such as reforestation
 - Percent of private forestland directly encumbered by Forest Practices Act best management practices compliance
 - Summary of federal forest plan project implementation monitoring results

Other relevant data sources

- Types of forest management standards/guidelines
- Voluntary and mandatory standards/guidelines
- Monitoring of standards/guidelines
- State forest planning
- Nonindustrial private forest planning
- National forest planning
- Bureau of Land Management planning
- Forest laws and policies

Goal B: Ensure that Oregon's forests provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, and efficient manner.



Importance: This criterion addresses economic values people place on trees and forests for meeting their forest products, recreational, cultural, social, psychological, and spiritual needs. Many people depend on forests for their livelihood and/or for their personal physical and mental well-being and forests in urban and rural areas contribute significantly to many community's economic base. In addition urban and community trees and forests provide cooling, storm water reduction, and other benefits. Tracking these values, as well as monitoring shifts in demand for products and services, provides useful insights for the future. Changes can indicate potential drains on the forest resource or highlight management opportunities.

The state's forests produce a multitude of goods and services—everything from timber and mushrooms to recreation and water. Sustainable forestry requires diverse, strong markets for a wide variety of products. Market forces are often the dominant influence on resource-based goods and services, but nonmarket forces—such as the desire to sustain biological diversity or the opportunity to dwell in or visit a natural place—are also important factors influencing investments in goods and services. Most forests can provide multiple goods and services simultaneously. However, there will always be situations

where multiple activities and desired uses are incompatible. Oregon's forests are diverse, and so are the objectives of forest landowners. To promote sustainable forest management, Oregon can take advantage of different management strategies for different forest types, ownerships, and locations.

Forest management strategies can be grouped into four broad categories: Wood production, Multiple-resource, Reserve, and Residential value emphasis.

The assessment will identify forest landscape areas where there is a real potential to access and/or supply existing or emerging markets such as those for biomass or ecosystem services. Examples might be areas where necessary infrastructure is planned or developing, where group certification of landowners has created market supply aggregation potential, or where retention and management of forest cover presents a money saving alternative to an engineered fix – such as a water filtration facility. Consideration will be given strengthening and developing new market opportunities for forest products and benefits provide incentives for forest stewardship and conservation. Consideration will be given to markets associated with environmental services and the assessment will identify potential areas where forest management can derive and maximize benefits for society.

The assessment will identify the current status of local government programs that care for community trees and forests where a majority of state populations reside.

Present and future conditions and trends in socioeconomic benefits to meet the needs of societies:

Related Geospatial Data Layers

Ties to national theme: Enhance Public Benefits

- Spatially explicit historical, current, and projected lumber and other wood product mill, biomass energy, and export locations—and relationships to employment and income, rural/urban data.
- Spatially explicit data about the historical, current, and projected, economics of log, biomass and wood products production and export
- Spatially explicit timber harvest report database for historical and projected timber harvests by owner
- Map of rural and urban areas in Oregon
- Data on forest revenues supporting state and local government public services (if possible with a map layer tying this information to ownership and location)
- Map of Recreational Opportunity Spectrum Oregon's Forests
- Maps of forested areas by passive use values, e.g., wilderness
- Spatially explicit projections of supply and demand for recreation
- Spatially explicit historical, current, and projected human population distributions
- Locations of mills
- Third-party certified forests

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **B.a. Forest-related revenues supporting state and local government public services**
Metrics:

- Payments related to National Forests including Secure Rural Schools and Community Self-Determination Act payments and National Forests timber harvest payments
 - Payments related to BLM forests including Secure Rural Schools and Community Self-Determination Act payments, payments from O&C grant lands timber harvest payments, and forest related payments in-lieu of taxes
 - Board of Forestry payments to counties and local taxing districts
 - Common School Fund payments
 - County Forest revenues
 - Forest land and mill property taxes and fire protection levies
 - Harvest tax
 - Weight-mile tax
 - Corporate income and excise tax
- **B.b. Forest-related employment and**
Metrics:
 - Forest-related employment in rural and urban areas and in forest-based communities
 - Forest-related wages and salaries in rural and urban areas and in forest-based communities
- **B.c. Forest ecosystem services contributions to**
Metrics:
 - Recreation use value
 - Passive use value
 - Carbon sequestration value
- **B.d. Forest products sector vitality**
Metrics:
 - Sales value of wood products and forest industry equipment from Oregon manufacturers
 - Cost of production compared to other areas
 - Production capacity, condition, technology, and investment
 - Capital expenditures in wood product and paper manufacturing
 - Net foreign and domestic exports of Oregon wood products

Other relevant data sources

- Database with historical, current, and projected rural and urban forest-related employment and income information by sector spatially referenced
- Database of historical, current, and projected returns from timber management and other income sources to landowner
- Information about log, chip, biomass and wood product haul distances
- Production capacity, condition, technology, of wood products industries
- Historical, current, and projected investment in wood industry infrastructure, investment, and innovation
- Development zone project databases: including historical, current, and projected numbers of structures, distance to other zones, and land use calls
- Land trusts

- Recreation usage
- Production capacity of mills
- Investment in wood products industry
- Historical and projected returns from timber management

Goal C: Maintain and enhance the productive capacity of Oregon's forests.



Importance: Productive forests supply important goods and services to society. They help prevent soil erosion, produce oxygen, filter pollutants, protect and enhance water quality, and offer a haven for recreation and spiritual renewal. Forests supply lumber and wood for homes, furniture, papermaking, and fuel. Other products include cones, boughs, herbs, medicines, and foods such as mushrooms and berries.

Forest productivity varies according to the amount of forest land available, and its fertility, health, environmental pollutants, location along the urban to rural continuum, past and current uses, and management. Managing forests sustainably means balancing resource production with the ecosystem's capacity to renew and sustain itself. Measuring and tracking the amount of forest land available for producing goods and services, the productivity of that forest land, and the amount, quality, and type of trees and other plants growing there is critical to determining whether we are balancing production and long term ecological health and the capacity of forest products markets to utilize timber and other forest products.

The assessment will identify and address areas where urbanization and fragmentation are occurring or has the greatest impact on high value forest ecosystems as well as opportunities to sustain large scale contiguous or connected forested landscapes.

Present and future conditions and trends in productive capacity of forests:

Related Geospatial Data Layers

- Spatially explicit land value information by land class, ownership, etc.
- Maps of historical, current and projected parcelization of private forestland
- Development zone project polygons, historical, current (2005), and projected
- Parcels/zoning
- Land values
- Urban Growth Boundaries
- Zoning
- Productivity
- Ownership and land allocations
- Land use
- Development zones
- Housing density
- Developable land

Ties to national theme: Conserve Working Forests

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **C.a. Area of non-federal forestland and development**

Metrics:

- Area of nonfederal wildland forest
- Parcelization of private forestland

- **C.b. Timber harvest trends compared to planned and projected harvest levels and the potential to grow timber**

Metrics:

- Annual timber harvest volume, compared to the volume expected under current plans and the potential to grow wood, public lands
- Annual timber harvest volume, compared to the volume expected under current and forecasted economic conditions and the potential to grow wood, private lands

Other relevant data sources

- Forest inventory, growth, removals, and mortality

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



Importance: Soil and water are the foundation for all other forest resources. *Soil*, which has both living and nonliving elements, holds water between rainstorms and stores nutrients for plants and animals. It is an anchor for vegetation and a seasonal or permanent home for a variety of burrowing animals, insects, and microscopic creatures. Soil conservation means maintaining site productivity and soil resource functions. Soil takes thousands, even millions, of years to develop; therefore, it is not considered renewable even though it can be formulated and restructured to support plant growth.

Water resources include the physical features, habitat, and inhabitants of lakes, streams, and wetlands, as well as the water itself. Forests and trees, whether urban or rural, help reduce storm water runoff, filter pollutants, store water and nutrients, clean and cool water, protect municipal water supplies, reduce flooding, replenish groundwater, and provide fish habitat. Water resources are a function (reflection) of watershed conditions.

The assessment will identify key watersheds necessary to maximize the forest benefits and where restoration or protection activities are particularly critical to water quality.

Present and future conditions and trends in soil and water resources:

Ties to national theme: Enhance Public Benefits

Related Geospatial Data Layers

- Spatially explicit historical, current, and projected water quality information integrated with development zone data and other land use data

- Spatially explicit historical, current, and projected riparian and floodplain data integrated with development zone data and other land use data
- Watershed assessment areas
- Wetlands
- Roads
- Impervious Surfaces
- Water quality limited streams
- Community water systems
- Topography
- Forestland by watershed

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **D.a. Water quality of forest streams**

Metrics:

- Physical/chemical properties (temperature, dissolved oxygen, turbidity, pH, phosphorus, nitrogen, nitrate, ammonium nitrate, total solids)
- Biological properties (bacteria, macro invertebrates, biological oxygen demand)

- **D.b. Biological integrity of forest streams**

Metrics:

- For macro invertebrates (mostly aquatic insects) and vertebrates (fish and aquatic amphibians): Species richness, percent alien species, percent cool water individuals, percent anadromous individuals, percent coldwater species, number of tolerant individuals, number of native coldwater species and individuals, number of size classes

- **D.c. Forest road risks to soil and water resources**

Metrics:

- Percent of road system disconnected from the stream network
- Percent of stream crossings on fish streams providing passage
- Land area in non-forest condition due to roads (road subgrade plus cutslope)

Other relevant data sources

- Floodplain data

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



Importance: Biological diversity is about variety—in the number and kinds of life forms, in their genetic makeup, and in the habitats where they live. Generally, greater diversity means a greater potential to adapt to changes. To preserve biological diversity, animal and plant species must be able to freely interact with one another and with their environment. There must be food, water, and shelter in sufficient amounts spread across the landscape. Biological diversity is often studied at ecosystem, species, and genetic levels.

A priority for federal and state forestry programs is to identify, protect, restore and properly manage important forested ecosystems. The assessment will identify and characterize important forest landscapes that possess a combination of attributes and values that collectively assign significance to the resource.

The assessment will identify forest landscapes that represent or contribute to viable habitats (contiguous or connected), contain high species richness, endemism, and/or that represent core habitat for focal conservation species (i.e. species of concern, threatened and endangered species or keystone species that are representative of a healthy ecosystem). The assessments will utilize information in the Oregon Wildlife Conservation Strategy.

Present and future conditions and trends in native forest plant and animal populations and their habitats:

Ties to national theme: Conserve Working Forests

Related Geospatial Data Layers

- Spatially explicit maps showing the level and extent of forest plant community changes based on indicator species.
- Spatially explicit maps of forest carnivore distributions
- Quantitative raster map depicting forest function and biodiversity sustainability based on a function of ownership, elevation and climate, forest carnivore composition/distributions, and vegetation indicator (forest structure, composition).
- Wildlife Conservation Opportunity Areas
- Wildlife Species Ranges
- Vegetation Cover Type, Canopy Cover Percent, Density, Height
- Vegetation Forest/Non-Forest Mask
- Protected category allocations
- Forest cover change detection from harvesting and fire

Relevant data from Oregon’s Indicators of Sustainable Forest Management

- **E.a. Composition, diversity, and structure of forest vegetation**
Metrics:
 - Vegetation species diversity: richness, evenness
 - Vegetation structure, percent cover
 - Vegetation change detection: plot #'s, area, percent cover
- **E.b. Extent of area by forest cover type in protected area categories**
Metrics:
 - Amount of area for each forest cover type
 - Ownership/protection category
- **E.c. Forest plant and animal species at risk**
 - Number of species in each federal ESA status ranking
 - Number of forest species in Oregon Natural Heritage Program Information Center Lists 1 and 2
 - Historic and current distribution of forest species

Other relevant data sources

- To be determined.

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



Importance: Forest health describes the overall condition of forests and trees and how well they recover from stress. Many factors affect forest health; some are natural, including insects and diseases, and severe weather or wildfire. Some are human induced, such as invasive species introductions and fragmentation. Combinations of stressors cause the greatest problem, much as we are more likely to get sick when our resistance is down. Stresses come and go, making forest health difficult to assess at a single point in time. For example, the amount of damage from native insects varies from year to year and decade to decade, depending upon weather, natural population cycles, and other factors.

The assessment will identify areas where management can significantly reduce the risk of wildfire while enhancing multiple associated forest values and services. The assessment will also consider the ability of the State of Oregon and communities to adapt to changing forest conditions, urbanization and landownership patterns. The assessment will identify areas where these effects of fire exclusion are significant, and identify communities at risk to catastrophic wildfires. The assessment will identify high value forest landscape areas that are especially vulnerable to existing or potential forest health risk factors and where forest management practices are most likely to prevent and mitigate impacts. The assessment will also identify areas where management could successfully recover or restore impacted forests.

The assessment will incorporate existing CWPPs and identify priority communities in need of assistance to develop CWPPs. Assessments will also identify priority areas to implement CWPPs, FIREWISE, and other policies to reduce the risk of wildfire.

Present and future conditions and trends in forest ecosystem health and vitality:

Related Geospatial Data Layers

- Insect and disease
- Ozone and Air Quality
- Climate Change
- Community at risk hazard rating
- Wildland Urban Interface Areas
- Community Wildfire Protection Plan areas
- Fire Regime Condition Class ratings
- Fire Return Interval

Ties to national theme: Protect Forests from Harm

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **F.a. Tree mortality from insects, diseases, and other damaging**

Metrics:

- Tree mortality (cubic feet)
- Current tree mortality from insects and diseases (acres)

- **F.b. Invasive species trends on forestlands**

Metrics:

- Biotic stressors: exotic insects and diseases, invasive plants, and animals (acres affected)
- The number or percent of invasive pests on Oregon's 100 most dangerous list excluded or contained in native and urban forests

- **F.c. Forest fuel conditions and trends related to wildfire risks**

Metrics:

- Percent of forestland in condition class 1, or fire regime IV or V.
- Percent of forestlands that produce a surface fire type (no passive or active crown fire) at 90th percentile weather and wind for region.
- Acres of forestland in fire regime I, II, or III that are treated to either maintain at, or reduced to, condition class I
- Acres of forestland treated to either maintain at, or reduced to, a surface fire type at 90th percentile weather and wind for region

Other relevant data sources

- Wildfire occurrence

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



Importance: Carbon-containing gases in the atmosphere, the so-called “greenhouse” gases, are strongly implicated as a potential source of climate change. Carbon dioxide, methane, and nitrous oxide have changed the composition of our atmosphere. Carbon dioxide concentration alone increased since the 18th century and greenhouse gases are expected to warm the earth by allowing sunlight to reach the earth's surface while blocking heat from escaping. Some of the gases also thin the ozone layer that shields the earth from harmful solar radiation.

Growing forests store carbon naturally in both the wood and soil in a process called *carbon sequestration*. Trees are about 50 percent carbon; wood products from harvested trees continue to store carbon throughout the life of the product. In general, forest activities such as tree planting increase carbon sequestration, while activities such as prescribed burning release carbon into the atmosphere. Increasing carbon stored in urban and rural trees and forests is usually an inexpensive way to mitigate increasing atmospheric greenhouse gases. In addition to sequestration, planting and maintaining trees in communities and especially around buildings to provide shade or block prevailing winds can moderate temperatures and substantially reduce energy demands and related greenhouse gas emissions.

The assessment will identify areas where management or restoration of the urban or exurban forest canopy will have significantly positive and measurable impact on air

quality and energy savings. The assessment will also identify opportunities for promoting carbon emissions offsets through forestry.

Present and future conditions and trends in forest contribution to global carbon cycles:

Related Geospatial Data Layer

Ties to national theme: Enhance Public Benefits

- Maps of Oregon by carbon sequestration and carbon storage potential

Relevant data from Oregon's Indicators of Sustainable Forest Management

- **G.a. Carbon stocks on forestlands and in forest products**

Metrics:

- Status of forest carbon stocks in various carbon pools, including forest products. (Expressed as mass/area)
- Status of changes in forest carbon stocks where forests and forest products acting as a source or as a sink. (Expressed as mass/area/unit of time)

Other relevant data sources

- FIA carbon inventory information and equations for species, forest type, size class, soils, etc.
- Biomass energy
- FIA carbon inventory

3. Existing and Emerging Benefits and Services

Considering the above analysis, highlight the benefits and services of forests and trees, including ecosystem services.

4. Issues, Threats, and Opportunities

Considering the analysis in the above two sections, outline the key forest-related issues, threats, and opportunities in the state.

5. Priority Forest Areas

This section would include:

- An overview of the geospatial analyses to identify priority forest landscape areas (include detailed information on data layers, themes, and methodology in an appendix).
- A description of any areas in the state that are identified as a priority by the geospatial analyses and non-geospatial data. Such areas will span ownerships and the urban to rural continuum.
- Description of any multi-state areas that are a regional priority.

6. Summary

Highlight and summarize key issues, threats, opportunities, and resulting priorities; including priority landscape areas identified as part of the geospatial assessment and

priorities that are not illustrated geospatially. May also want to provide a summary of how state issues and priorities are related to the national themes.

7. Appendices

References

Methodology for Geospatial Analysis

Data gaps—provide a list of data gaps to help focus work at the national and regional level to fill those gaps.