JUNE 2010

Statewide Forest Resource Assessment & Strategy

FOR WASHINGTON STATE

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

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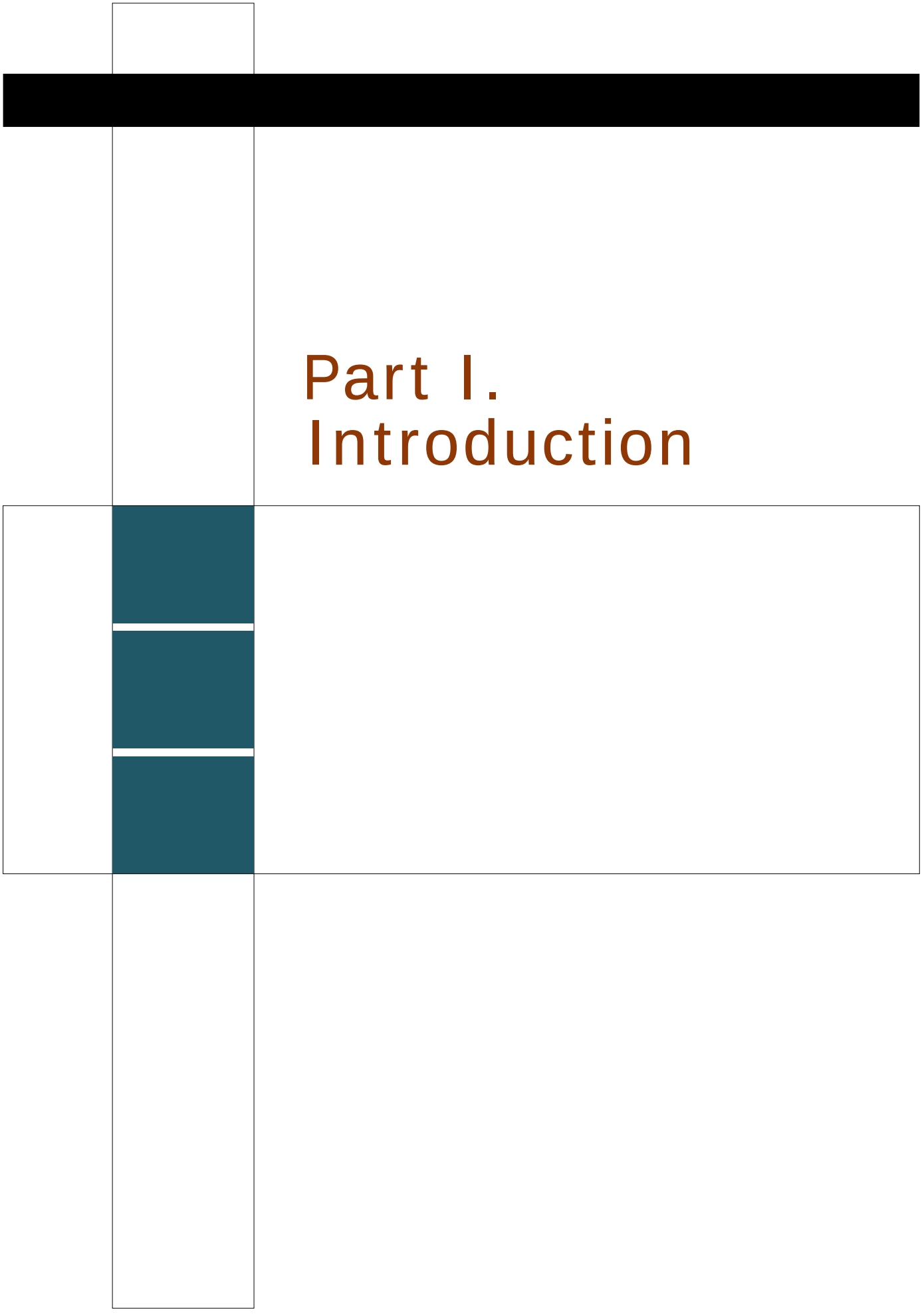

Part I Contents

Introduction

PURPOSE & STATUTORY FRAMEWORK

The Washington State Department of Natural Resources (DNR) and other state forestry agencies across the nation administer an array of federal programs for landowner assistance, forest conservation and management, and fire prevention and suppression. Collectively, many of these fall under the federal Cooperative Forestry Assistance Act (Title 16 U.S. Code, Chapter 41), and are sometimes called U.S. Forest Service "State & Private Forestry" programs. Specifically, these include:

- Private Land Fuels Management & Community Protection (multiple programs)
- Cooperative Forest Health Program
- Forest Stewardship Program
- Urban & Community Forestry Program
- Forest Legacy Program
- State Fire Assistance Program
- Volunteer Fire Assistance Program

Since 2007, efforts have been ongoing among the U.S. Forest Service and State Foresters to "redesign" State & Private Forestry programs. The recent legislative development of a provision in the 2008 Farm Bill required state forestry agencies to conduct a Statewide Assessment & Forest Resource Strategy (Title 16 U.S. Code Sec. 2101) in order to continue receiving federal funds for these programs. The assessment & strategy were required to be completed by June, 2010.

The outcome of this process will be to identify the types of work needed to address national, regional, and state forest management themes, and to designate priority forest landscapes in which work could take place over the next five years. The Farm Bill directs that the state's process be divided into three components:

1. **Statewide Assessment of Forest Resources:** to provide an analysis of forest conditions, trends, threats and opportunities in the state and the information necessary to delineate priority forest landscapes.
2. **Statewide Forest Resource Strategy:** to provide a long-term plan for investing state, federal, and other resources to manage priority landscapes identified using the assessment, focusing where federal investment can most effectively leverage desired action and engage multiple partners.
3. **Annual Report on Use of Funds:** to describe how State & Private Forestry funds were used to address the priorities in the assessment and strategy, including performance measures, for any given fiscal year.

Statewide Assessments and Strategies are to be revised every five years.

The redesign effort and the Farm Bill language specify three nationally-significant themes that State & Private Forestry programs are to address. This is designed to assure that the deployment of these programs will contribute to issues of national significance. Subsequent guidance was issued by the U.S. Forest Service on objectives that accompany the statutory themes, and the content and requirements of statewide assessments and strategies (U.S. Forest Service 2008). The statutory themes and objectives from the final guidance are as follows:

1. **Conserve Working Forest Lands:** conserving and managing working forest landscapes for multiple values and uses.
   1.1. Identify and conserve high priority forest ecosystems and landscapes.
   1.2. Actively and sustainably manage forests.
2. **Protect Forests from Harm:** protect forests from threats, including catastrophic storms, flooding, insect or disease outbreak, and invasive species.
   2.1. Restore fire-adapted lands and reduce risk of wildfire impacts.
   2.2. Identify, manage and reduce threats to forest and ecosystem health.
3. **Enhance Public Benefits from Trees and Forests:** including air and water quality, soil conservation, biological diversity, carbon storage, and forest products, forestry-related jobs, production of renewable energy, and wildlife.
   3.1. Protect and enhance water quality and quantity.
   3.2. Improve air quality and conserve energy.
   3.3. Assist communities in planning for and reducing wildfire risks.
   3.4. Maintain and enhance the economic benefits and values of trees and forests.
   3.5. Protect, conserve, and enhance wildlife and fish habitat.
   3.6. Connect people to trees and forests, and engage them in environmental stewardship activities.
   3.7. Manage and restore trees and forests to mitigate and adapt to global climate change.

ISSUES FOR THE STATE OF WASHINGTON

To establish the structure and focus of Washington's statewide assessment and strategy, the national themes and objectives needed to be correlated with the major issues that confront forest managers and forest landowners in the state. The cross-walk between Washington State issues, national themes and objectives, and specific State & Private Forestry Programs is displayed in Table i1.

Table i1. Washington State-specific issues relative to national themes and specific programs

Washington State Issues	National Themes & Objectives	State & Private Forestry Programs
Working Forestlands & Conversion	1.1, 1.2, 3.1, 3.4, 3.5, 3.6, 3.7	Forest Stewardship Forest Legacy Cooperative Forest Health
Biodiversity & Habitat Conservation	1.1, 2.1, 2.2, 3.1, 3.5, 3.6, 3.7	Forest Stewardship Forest Legacy Fuels Cooperative Forest Health Urban & Community Forestry
Upland Water Quality, Quantity & Puget Sound Restoration	1.1, 1.2, 2.1, 2.2, 3.1, 3.5, 3.6, 3.7	Forest Stewardship Forest Legacy Fuels Cooperative Forest Health Urban & Community Forestry
Forest Health Restoration	1.2, 2.2, 3.1, 3.4, 3.6, 3.7	Cooperative Forest Health Forest Stewardship Fuels Urban & Community Forestry
Wildfire Hazard Reduction	2.1, 2.2, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7	Fuels Forest Stewardship Cooperative Forest Health Urban & Community Forestry State Fire Assistance Volunteer Fire Assistance
Urban & Community Forestry	2.2, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	Urban & Community Forestry Cooperative Forest Health Fuels

The selection of Washington State issues was based on a combination of input from federal and state agencies, stakeholders and internal DNR expertise. The objective was to frame the assessment in terms of broad considerations that DNR and its partners see as significant to conserving and managing Washington's forests into the future.

In addition to the contributions that State & Private Forestry programs can make to Washington's forests, considerable local, tribal, state and federal government, private industry, and non-governmental organization resources are dedicated to addressing these issues in the state. Better integration and coordination among these efforts will insure that deployment of State & Private Forestry program funding is aligned with both federal and state, and local priorities. This coordination also will contribute to shared objectives and priorities with these other organizations, which in turn will leverage additional accomplishments.

DNR Strategic Plan 2010-2014

DNR has also recently completed an agency-wide strategic planning effort that guides the agency's focus and new initiatives. Issues selected for the Statewide Assessment &

Resource Strategy can also be seen as an expression of agency-wide priorities and specific goals from the Strategic Plan (DNR 2010).

The issue of Working Forestlands & Conversion is a primary concern of DNR both as the state's principle forestry agency and as a forestland manager. The pattern and rate of forest conversion of private lands to non-forest uses is resulting in a loss of habitat, recreation lands, and impacts to Washington's resource-based economy. Therefore, DNR has established major initiatives to support small forest landowners to maintain their land as working forests; advance policies and incentives to prevent the loss of private working forest lands and retain associated jobs; consolidate DNR-managed working forests into strategically positioned blocks that help provide compatible management for neighboring forest lands; and permanently maintain DNR-managed working forests at greatest risk of conversion (Goal 3).

Biodiversity & Habitat Conservation has a nexus with the agency's strategic priorities in two main areas – natural area conservation and climate adaptation. As the state's manager of Natural Areas and the Washington Natural Heritage Program, DNR conserves key areas significant for biodiversity in at-risk ecosystems, and collects scientific information to support conservation of ecosystems. The agency has made the protection of at-risk ecosystems a major strategic initiative (Goal 1E). DNR has additionally made a significant commitment to incorporate a climate adaptation strategy for all agency programs, including consideration of elements of biodiversity, including ecological interactions, species genetics and adaptability, and migration pathways (Goal 5C).

Upland Water Quality, Quantity & Puget Sound Restoration are at the core or of DNR's responsibilities to regulate forest practices activities and manage forested state trust lands. Ensuring that the Forest Practices Program provides adequate protection, implementation and compliance is key to protecting upland water quality, and ultimately to contributing to Puget Sound restoration efforts. To that end, DNR will evaluate Forest Practices Rules to ensure forest management activities do not increase the risk, frequency or severity of landslides (Goal 2C). Additionally, DNR will work to ensure the delivery of cold clean water from forested streams, initially through monitoring (Goal 4B).

The DNR Strategic Plan exists in an acknowledged context of a strong fire and emergency response responsibility. In addition to that ongoing responsibility, the Strategic Plan addresses both Forest Health Restoration and Wildfire Hazard Reduction through the development of renewable energy resources and addressing the challenges of climate change. In its role of manager of over two million acres of forest land in the state, DNR has set its sights on developing renewable energy resources on state land, including biomass from unhealthy, overstocked forests in Washington State (Goal 5B). Development of a biomass energy program on state lands will make a significant contribution to restoring forest health, particularly in Eastern Washington, where forests suffer from past fire exclusion, disease, and challenges presented by a changing climate.

Further, development of a DNR climate adaptation strategy (Goal 5C) will help the agency respond to major disturbance events, including forest health crises, and manage the risk of wildfire.

Finally, DNR will focus strategic direction on restoration of forests, with an initial focus on riparian lands and urban and community forests (Goal 4B). DNR will also create a Community Forest Trust to protect key forestlands near urban communities from development. This demonstrates the important role that Urban & Community Forests play in maintaining water quality and quality of life.

WASHINGTON'S FORESTS

The forested environments of Washington State are unique, extensive, diverse and productive. The economic, environmental and social benefits of these forestlands are of national significance. Although it is the smallest of the western states (42.5 million acres), Washington encompasses nearly all of the major biological habitats found in the west. Of Washington's total land area, more than half — 22.1 million acres — is forested. Western Washington contains a great diversity of habitats, from rain forests to alpine meadows and dry prairies. For example, while forests on the western side of the Olympic Peninsula receive as much as 175 inches of rain per year, along the northeastern, leeward side of the Olympic Mountains, a rain shadow is formed, parts of which receive only 18 inches of annual precipitation.

Prior to the arrival of Euro-American settlers in the nineteenth century, all of Western Washington was forested with the exception of 8.9 percent of the landscape above the alpine timberline and another 1.4 percent of non-forested prairies or wetlands. The unique confluence of climactic and soil conditions makes Western Washington trees grow quickly, to enormous proportions and to extraordinarily long-lived ages. Some trees are 1,000 to 2,000 years old. Numerous trees in Olympic National Park have been recognized as national champions for their overall size, including a 20-foot diameter, 160-foot tall western redcedar and an 18-foot diameter, 191-foot tall Sitka spruce.

The sharp contrast between the steep mountainous topography of the Cascade Range and the gentle terrain of the Columbia Basin has dramatic effects on precipitation and temperature gradients in Eastern Washington. Accordingly, tree species have become stratified by their competitive abilities and tolerance to both drought and cold. Whereas coniferous cover has decreased since Euro-American settlement in Western Washington, it has likely increased significantly in Eastern Washington owing to the decrease of natural wildfires affecting the forest landscape.

The dominance of evergreen conifers in the Pacific Northwest makes it unique among the temperate regions of the world. In all other temperate regions, including eastern North America, Europe, Asia, Australia, Chile, and New Zealand, conifers are relegated to

early successional roles, limited to extreme habitats, or at best share dominance with flowering plants. Here, the opposite is true: flowering plants are relegated to early successional roles, as in the case of alders and cottonwoods, or limited to stressful habitats, as in the case of oaks and madrones.

For all their diversity, Washington's forests also are some of the most economically productive in the United States. The forests provide essential habitat for many of the 50 wildlife and plant species in Washington that have been federally listed as threatened or endangered, while being ranked second among all states in softwood lumber production. In fact, more than 5,000 different consumer products are made with trees grown in Washington. These same forests provide cold, clean water for thousands of miles of streams and rivers that are home to iconic Pacific Northwest salmon species, and grow culturally significant edible and medicinal plants, both of which are essential for Indian tribal cultures.

Climate

Washington's climate is controlled by three factors: (I) location on the windward coast of the Pacific Ocean; (2) the Cascade Mountain Range, which runs north and south through the center of the state; and, (3) the semi-permanent high- and low-pressure regions located over the north Pacific Ocean. These factors combine to produce dramatically different conditions within short distances. The Cascade Range, for instance, blocks the initial easterly thrust of Pacific storms from entering Eastern Washington while protecting Western Washington from the polar-continental influence. Thus, Western Washington has a marine climate and Eastern Washington a marine-continental climate.

The gernerally warm current that circulates around the northern Pacific contributes to a moderate climate along the coast of the Pacific Northwest. Successive moisture-laden storms move into the Pacific Northwest during late fall, winter, and early spring. They are intercepted first by coastal ranges (the Olympic Mountains and Willapa Hills) and then by the Cascade Mountains, leaving much of Eastern Washington in a rain shadow with an almost desert-like climate. From late spring to early fall, the Pacific high pressure ridge moves progressively farther north, weakening storms off the Pacific, and limiting rainfall.

Annual precipitation ranges from 75 inches along the coast to 175 inches along the western slopes of the Olympic Mountains and nearly 100 inches in the Willapa Hills to the south.The rain shadow effect of the Olympic Mountains results in only 16-25 inches of rain on the northeast part of the Olympic Peninsula and in parts of the San Juan Islands. From the Puget Sound lowlands south to the Columbia River, the mean annual precipitation is 40-60 inches. Precipitation increases along the west slopes of the Cascades, reaching 120 inches annually in some places. Striking gradations in precipitation totals also are noted on the eastern slopes of the Cascades, decreasing to

an annual mean of 12 inches at 40 miles from the crest and down to only 8 inches in the southern part of the central basin.

In Western Washington, the sun shines about 24 percent of the time in December. In July, the figure is typically about 61 percent. In Eastern Washington, the sun shines 25-30 percent of the time in December and January, but to 80-85 percent in July and August. Frost-free days in Western Washington begin in late April and continue to early November, while in Eastern Washington the frost-free period begins in late May and ends in late September.

Forest Cover & Vegetation Zones

About half (22.9 million acres) of the 43.3 million acres that make up Washington State are mapped as forestland. In terms of broad categories of land cover, the State consists of 53 percent forestland, 16 percent shrubland, 7 percent grassland, 18 percent agricultural lands, 2 percent freshwater and wetlands, 2 percent perennial ice, snow and rock, and 2 percent developed residential and commercial lands.

Franklin and Dyrness (1973) created a classification system to map forested vegetation zones in Washington. Subsequent efforts by the DNR, U.S. Forest Service, and other agencies have further expanded and subdivided the vegetation zones into plant associations. Plant associations are groupings of plant species that recur on the landscape with particular environmental tolerances. They can be useful tools for predicting environmental conditions, site productivity, and response to forest management. In the simplest terms, the forests of Western Washington can be divided into seven vegetation zones (Figure i1), and those of Eastern Washington can be divided into twelve vegetation zones (Figure i2). Vegetation zones are defined by their potential climax tree species — the species that may (or could) occur there given sufficient time and lack of disturbance. In many cases, the namesake climax species is absent or present only in small numbers as a result of the current successional state, or the history of disturbance. Generally speaking, the climax species is the most shade-tolerant tree species that can regenerate under a forest canopy.

Western Washington Vegetation Zones

The **subalpine fir** (*Abies lasiocarpa*) and **mountain hemlock** (*Tsuga mertensiana*) **zones** include all of the upper treeline forests in the state. Most of the high-elevation forests in Western Washington are very wet and snowy, and fall within the mountain hemlock zone. Only a small section of subalpine fir zone occurs in Western Washington, most notably in the northeastern section of the Olympic Mountains where a significant rain shadow exists. The great width of the north Cascades also produces a large rain shadow near the Cascade crest where subalpine zone forests also occur.

Together, the **Pacific silver fir** (*Abies amabilis*), **Sitka spruce** (*Picea sitchensis*), and **western hemlock** (*Tsuga heterophylla*) **zones** account for the majority of forested land in Western Washington. The Pacific silver fir zone occupies the mid- and upper montane zones of the Olympic and Cascade Mountains and the highest elevations of the Willapa Hills; the Sitka spruce zone occupies the outer coastal areas; the western hemlock zone occupies the remainder of the region.

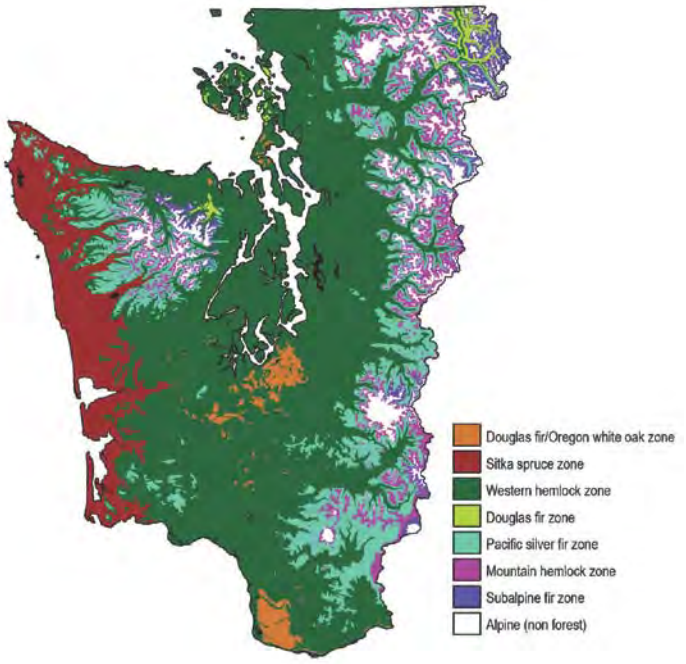

Figure i1. Western Washington forested vegetation zones (Van Pelt 2007)

A few exceptions are notable. Western hemlock, Pacific silver fir, and western redcedar (*Thuja plicata*) are lacking in parts of the Puget Trough and the driest montane of the rain shadows. Here, Douglas-fir (*Pseudotsuga menziesii*) is the primary tree species and is also found uncharacter-istically in the understory. These forests are included in the **Douglas-fir zone** and are similar to many mid-montane forests in Eastern Washington.

The final vegetation zone, the **Douglas-fir/ Oregon white oak zone**, is found in the excessively drained sands and gravels of southern Puget Sound and the Willamette Valley of Oregon. This zone is characterized by the presence of Oregon white oak (*Quercus garryana*), Western Washington's most drought-tolerant tree. Douglas-fir and Oregon white oak are found along the perimeter and scattered throughout the native prairies of the Puget Lowlands, Chehalis, Cowlitz, and Willamette valleys. Oregon white oak, with its bimodal ecological distribution, also may be found in wetlands.

Eastern Washington Vegetation Zones

Tree-dominated vegetation communities in Eastern Washington range from sparse savannas and woodlands to dense forests. Upper and lower treelines, some south-facing slopes, and areas of thin soils are naturally sparse. Within this assessment, Eastern Washington forests are defined as all habitats in which mature tree crowns cover at least one third of the land area; woodlands are habitats in which mature tree crowns cover less than one third of the land area.

The highest forested zone in the region is the **subalpine fir** (*Abies bifolia*) **zone**. The most extensive of the subalpine forest communities, the zone is named for the most shade-tolerant species.

However, other species, most commonly Engelmann spruce (*Picea engelmannii*), are often present in greater numbers. The **mountain hemlock zone** encompasses many very wet and snowy high-elevation forests near the Cascade Crest. Only a small section of this zone occurs in Eastern Washington, as the arid environment quickly becomes too hostile for mountain hemlock. Similarly, the **Pacific silver fir** and **western hemlock zones**, common in Western Washington, occur in limited areas near the Cascade Crest. Tree species diversity in Eastern Washington is highest within these three zones, with sometimes a dozen or more species found growing side by side. Although precipitation in the northeastern corner of the state is sufficient to support both western redcedar and western hemlock forests as well as a high diversity of tree species, the Columbia Rocky Mountain western redcedar and Columbia Rocky Mountain western hemlock zones differ in many ways from their Cascade counterparts.

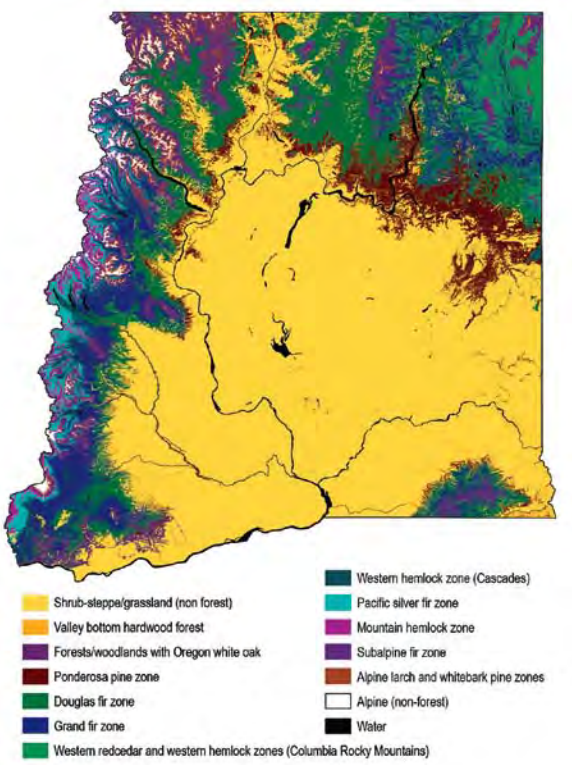

Figure i2. Eastern Washington forested vegetation zones (Van Pelt 2008)

The **grand fir** (*Abies grandis*) **zone** is the primary mixed conifer forest belt of Eastern Washington. Some of the highest forest productivities in Eastern Washington and many of the largest pines, larches, and Douglas-firs are found within this zone. As grand fir is a drought-sensitive species, this zone is largely limited to the South Cascades and Columbia Rocky Mountain regions.

The Douglas-fir zone is the most extensive forested zone in Eastern Washington, consisting of drier areas with annual precipitation between 20- and 31 inches. Generally too dry for grand fir, the primary conifer species present are ponderosa pine (*Pinus ponderosa*) and Douglas-fir. Limited areas of western larch (*Larix occidentalis*) and lodgepole pine (*Pinus contorta*) also may be found.

The **ponderosa pine zone** occupies the driest forested environments at the lower fringes of the forested landscape where even Douglas-fir cannot survive. The true ponderosa pine zone is not very extensive, even though ponderosa pine is one of the most

widespread tree species in Eastern Washington. Oregon white oak becomes a dominant tree or shrub, often growing with ponderosa pine and/or Douglas-fir near lower treeline within the South Cascades region, adjacent to the Columbia River. Strictly speaking, pure stands of Oregon white oak contain no conifers and represent a small fraction of the area mapped as forest/woodlands within the Oregon white oak zone. Most of the eastern portion of the area depicted is in the ponderosa pine zone, while most of the western portion is in the Douglas-fir zone.

In many western states, pure or dominant stands of lodgepole pine are common. In Eastern Washington, it is most abundant in the western portion of the Okanogan Highlands, but is present in all forested regions. Nearly always successional to other species in the forests of Eastern Washington, lodgepole pine develops extremely dense stands of small trees that are highly susceptible to stand-replacing fire events. For this reason, lodgepole pine does not have its own zone, even though it may appear as the only species capable of growing in certain areas.

PRIVATE FOREST LAND MANAGEMENT

Private landowners manage 11.6 million acres of forestland in Washington State (Rodgers and Cooke, 2009). This acreage is about equally divided between commercial industrial owners and non-industrial small forestland owners (Figure i3). While each must meet economic performance objectives, their approach and other objectives for their forests vary widely. The pattern of forestland ownership also varies significantly between Eastern and Western Washington. In Western Washington, where forest growth productivity is greatest, the area of industrial forestland ownership is more than three times higher than it is in Eastern Washington. Small forestland ownership acreage is roughly the same when comparing Eastern and Western Washington.

Commercial industrial forestland is managed primarily to produce a sustainable volume of wood. As a share of the state's total timber harvested, industrial lands supply 73 percent of the volume, despite the fact that they comprise just 23 percent of the total area of forestland. Beyond a unifying objective among industrial owners to generate economic benefits and wood products, specific management objectives are not monolithic among the many and ever-changing types of corporate structures. In Western Washington, even-aged management systems on 40-year harvest rotations are very common. However, some landowners also choose to manage for larger trees and more complex forest structures over longer rotation periods. Few industrial landowners remain that could be called "vertically integrated" companies; in other words, companies who own timberland, sawmills, manufacturing facilities for panelboard, papermaking or other wood products, as well as product marketing. Where this model was prevalent historically, land management and manufacturing typically are owned by different companies today.

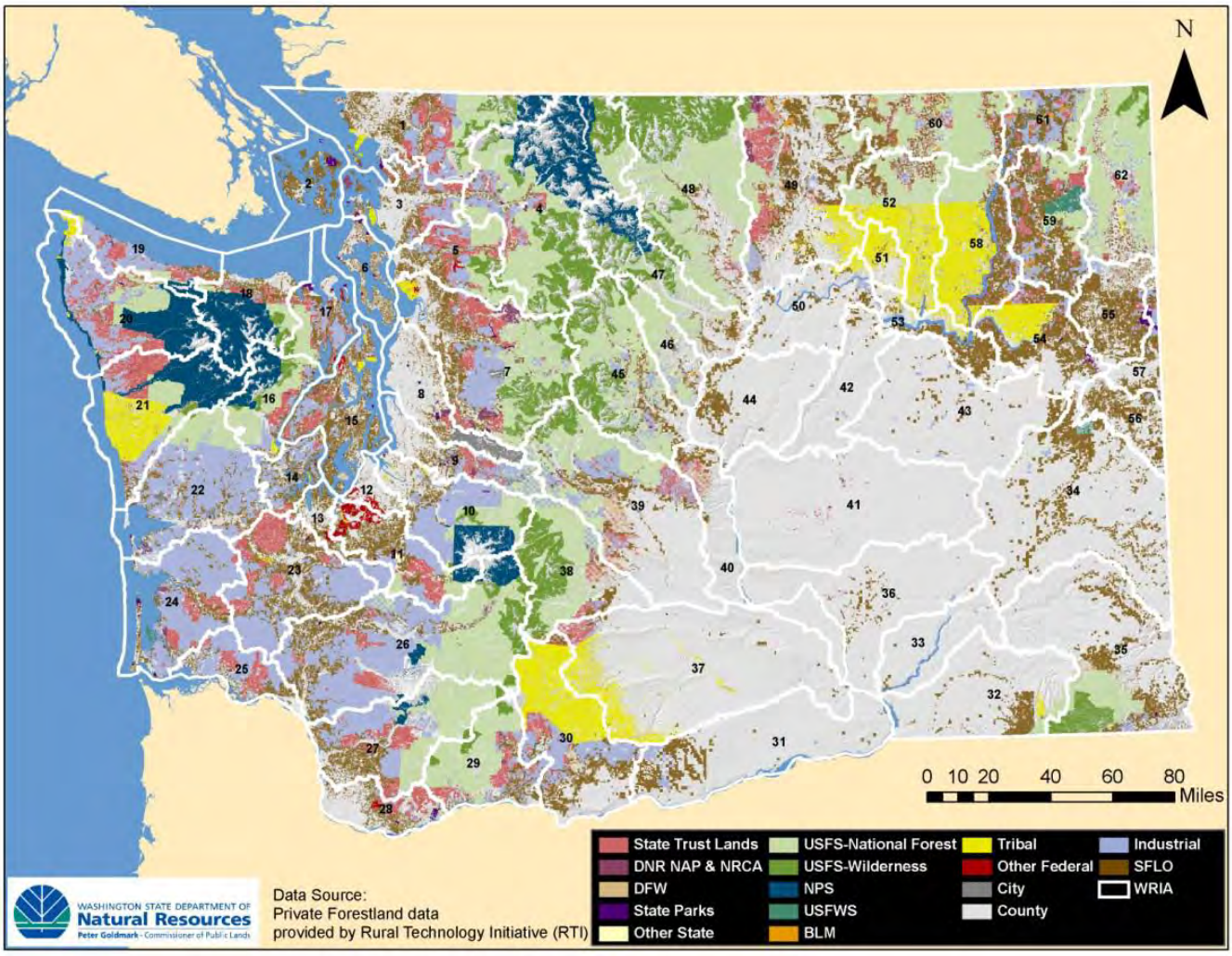

Figure i3. Forestland Ownerships in Washigton State

Small forestland owners are even more diverse in their characteristics and management objectives. They can range from family tree farms and other enterprises, to forested components of cropland production, multi-purpose working forests and home sites, and small recreational or residential tracts. In many cases, forest management activity is episodic, perhaps motivated by personal or financial circumstances, or in response to the immediacy of a specific concern like insect infestation or wildfires. Some small forest ownerships are run as a business and must generate regular income. As a share of the state's total timber harvested, small private forestland supplies about 10 percent. Overwhelmingly, the sizes of small private parcels are 20 acres or less, and an increasing number of these include primary or secondary residences. Because of the sheer number of different owners, no single set of assumptions about economic or social motivations can be applied.

TRIBAL NATURAL RESOURCE MANAGEMENT

Indian tribes always have inhabited the watersheds of Washington State, their cultures based on harvesting fish, wildlife, and other natural resources in the region. Inherent tribal sovereignty and tribal rights predate the formation of the United States and the State of Washington. In treaties signed during the 1850s, tribes of the Washington Territory ceded millions of acres of land to the federal government (Figure i4). In exchange for the ceded land, the tribes were to receive certain payments, services, and protections from the government. The tribes also reserved certain rights to protect their way of life:

> *"The right of taking fish and usual and accustomed grounds and stations is further secured to said Indians, in common with all citizens of the United States; and of erecting temporary houses for the purposes of curing; together with the privilege of hunting on open and unclaimed lands. Provided, however, that they shall not take shell-fish from any beds staked or cultivated by citizens."*
>
> —Treaty of Point No Point, January 26, 1855

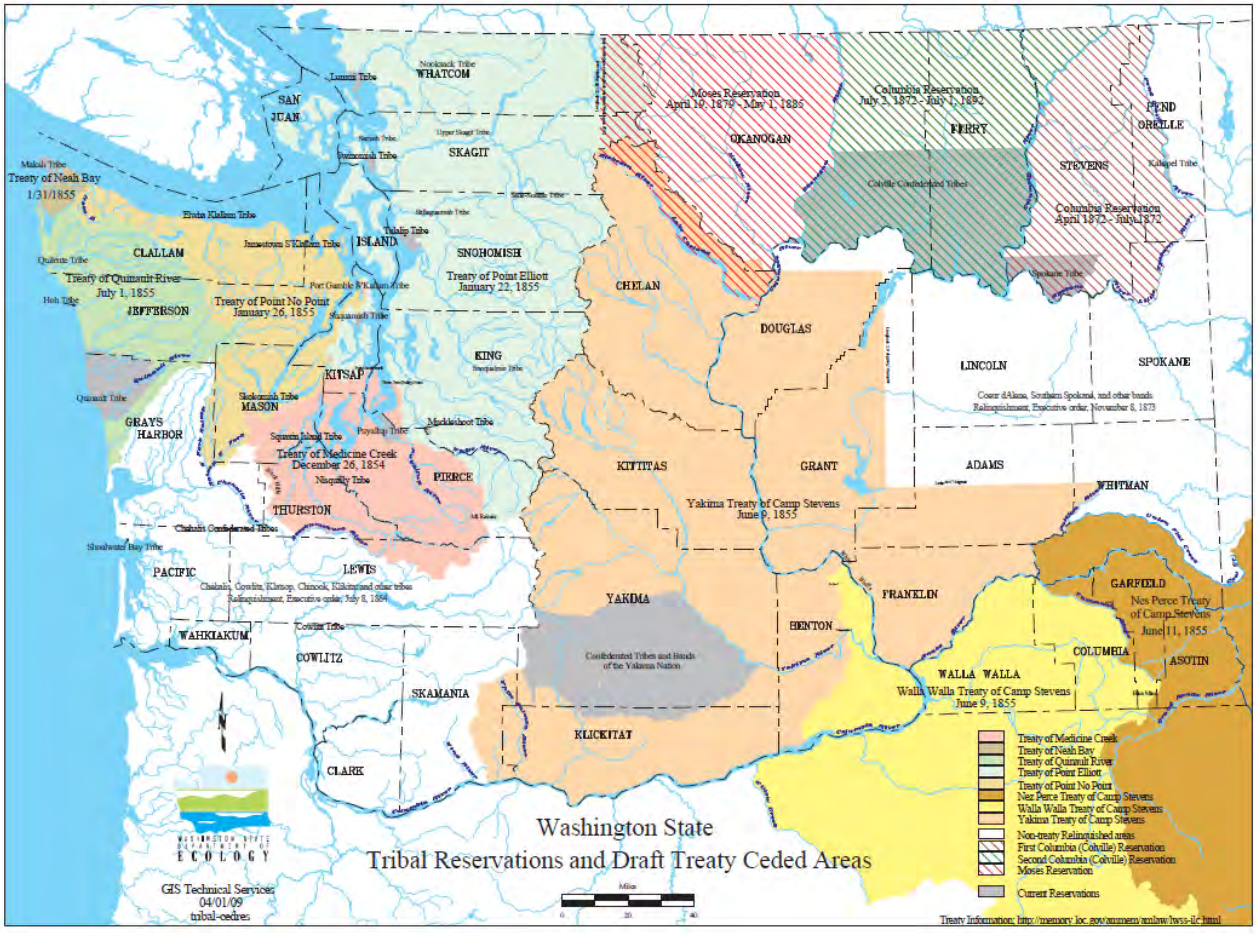

Figure i4. Washington state tribal reservations and treaty ceded areas

The promises of the treaties were not fulfilled, and the struggle to obtain recognition of those rights climaxed in the "Fish Wars" of the late 1960s and early 1970s, when tribal members were arrested and jailed for fishing in defiance of state law.

In 1974, the tribes won a major victory in *United States vs. Washington* (known as the Boldt Decision), which reaffirmed their treaty-protected fishing rights. The ruling, subsequently upheld by the U.S. Supreme Court, established the tribes as co-managers of Washington's fisheries resources and entitled them to 50 percent of the harvestable number of salmon returning to Washington waters.

Today, Washington's 29 federally recognized Indian tribes are vital government-to-government partners in managing the state's salmon and shellfish stocks, protecting public and cultural resources through the course of forest management practices, and innovators in managing tribal forest resources. The State of Washington, through the Centennial Accord, Millennium Agreement, and other government-to-government agreements, is committed to working cooperatively and respectfully with sovereign tribes to preserve and protect natural and cultural resources, as well as to meet other mutual goals. The state Department of Natural Resources, specifically through the Commissioner's Order on tribal relations and other policy, procedure, and agreements, has expressed its shared objectives with tribal governments for proper stewardship of public natural resources, and acknowledges and respects the values, culture, and natural resources wisdom accumulated by tribal people over the millennia.

Tribal Reservation Forest Management & Enterprises

Tribal governments in Washington manage nearly 1.7 million acres of forestland (Figure i4) that is held in federal trust with the U.S. Department of Interior Bureau of Indian Affairs (BIA). Tribal forest enterprises have become increasingly important contributors to forest management in Washington. Tribal forestry programs have transitioned towards great autonomy, with less reliance upon BIA assistance. Rigorous and integrated natural resource management planning, development and diversification of additional tribal enterprises such as forest products manufacturing, and tree genetics and seedling production programs have been initiated by many tribes. Tribal enterprises are operated under the guidance of tribal councils, and as such, are managed to achieve broader socioeconomic goals in addition to meeting economic performance objectives. Indian forests produce timber and revenue as well as a wide variety of non-timber products such as traditional foods and medicines, cultural values, and firewood. Spiritual use, water, and fish and wildlife habitats are also important. Protection of forests for use by tribal members on an enduring basis is a paramount management emphasis in tribal forest planning.

Tribal Partnerships in Forest Practices

Washington's Indian tribes are essential cooperators in DNR's Forest Practices Program — and this relationship began with the Timber/Fish/Wildlife (TFW) Agreement.

After the adoption of the Washington State Forest Practices Act in 1974, there was continuing contention over the adequacy of forest practices regulations. The climate became increasingly unwieldy and adversarial. Subsequent amendments to the Act ironed out some wrinkles. In the summer of 1986, representatives of state agencies, Indian tribes, the timber industry and environmental groups met to discuss a better way of doing business. These various groups held more than sixty meetings in a five month period, which resulted in a final agreement in 1987.

The TFW Agreement is a fluid, changeable, "living" document designed to reshape the way forest-based natural resources are managed in Washington State. This agreement of commitment by all parties supports working together to reach consensus. The TFW process recognizes that many different interest groups and governmental agencies must be involved, together, in order for the best decisions to be made. The decisions take into account the need for a viable timber industry as well as a need for healthy fish and wildlife habitats, the protection of water quality, and respect for tribal archaeological and cultural heritage.

Washington tribes, as well as some tribes in Oregon and Idaho, also are partners in the aspects of the Forest Practices Program that have evolved since the TFW Agreement. Tribes are members of several committees: DNR Forests and Fish Policy; Cooperative Monitoring, Evaluation and Research (CMER); Forest Practices Board's TFW Cultural Resources; and the Small Forest Landowner Advisory Committee. Tribal representatives work with staff from DNR's Forest Practices program and other agencies and organizations to draft forest practices rules and Board Manual guidelines, review individual Forest Practices Applications, notifications and alternate plans, provide technical on-site expertise in DNR's interdisciplinary team reviews, and complete water and wetland typing.

Cultural Resources

Throughout all land management and resource protection programs, DNR's policy is that agency personnel will identify potential archaeological, historic and cultural sites and resources in the course of their normal duties. Discovered resources are recorded and inventoried in coordination with the Washington State Office of Archaeological and Historic Preservation and the appropriate Tribes so that they can be protected to the full extent allowable by law.

Cultural resources are typically different among tribes because each tribe has a truly unique socio-cultural foundation and background. Specific resources are defined in Washington State statute and individual agency administrative code provisions, but in

the context of the forest environment, these generally include historic sites, traditional places, traditional materials and archaeological resources.

Historic sites could be considered locations where Native or non-Native events and activities have taken place since contact with Euro-Americans. Historic sites often, but not always, have written records that document the events and activities that occurred at a particular location. Examples of historic sites include homesteads, forts, lumber mills and cabins.

Traditional places could be considered landscapes, sacred sites, legendary areas, indigenous uses and objects which are identified (often with traditional names) by specific Indian tribes in the state of Washington as being important for the maintenance and perpetuation of their traditional values and practices. These landscapes, places and objects provide subsistence and spiritual relationships, as well as stability and meaning to community ceremonies, customs and beliefs. Examples of traditional places include sacred ceremonial sites, groves used for gathering edible or medicinal plants and sources of materials used for traditional tools and arts.

Traditional materials could be considered the resources used by Native peoples to sustain their culture. Traditional materials come from the broad variety of plants, animals and minerals that are indigenous to this region's native landscapes. The individual species recognized as a cultural resource are specific for each tribe. Traditional and current cultural values for plants include their use as medicines, foods, tools, textiles, building materials, carvings, and sacred objects. Examples of traditional materials (such as some of the plants utilized by tribes) include bear grass, tule, and cedar and birch trees.

Archaeological resources are only one kind of cultural resource. Archaeological resources provide evidence of the cultural continuum of people occurring across time and space throughout the diverse landscapes of Washington. Archaeological resources demonstrate the variety of activities engaged in by tribal ancestors (such as tribal fishing, hunting, gathering and spiritual practices) which still continue today. Examples of archaeological resources include shell middens, lithic scatters, rock paintings, talus slope gravesites, and culturally modified tree locations.

Each tribe is the primary keeper of the cultural resource knowledge specific to their people. Since some cultural resources are non-renewable and irreplaceable, many locations of sacred and ceremonial places will never be revealed to people outside of the tribe. Landowners and agencies recognize the need for confidentiality in order to protect tribal knowledge and information. Plans to protect cultural resources therefore include provisions to protect the privacy, security, and confidentiality of cultural resources.

In addition, through the course of carrying out regulatory and landowner assistance responsibilities, DNR maintains the policy of assisting and encouraging private landowners to identify, inventory and protect historical, cultural and archeological sites on their land.

FEDERAL FOREST LAND MANAGEMENT

Federal agencies manage 9.5 million acres of forestland in Washington State (Figure i3), including more than 8 million acres by the U.S. Forest Service and more than 1 million acres by the National Park Service. The Bureau of Land Management is responsible for the management of 69 thousand acres of forestland, the Department of Defense manages 60 thousand acres in several large military reservations, and the U.S. Fish and Wildlife Service manages 58 thousand acres of forestland refuges. At the most basic level, these lands are managed for various public benefits and generally not for revenue production.

There are six units of the National Forest System that are wholly or partially within Washington State's boundaries. These include the Olympic, Gifford Pinchot, Mount Baker-Snoqualmie, Okanogan Wenatchee, Colville and Umatilla National Forests. A significant portion of forestland in the National Forest System is congressionally reserved as Wilderness, Wild and Scenic River corridors, and National Recreation Areas. Together, these designations total 2.7 million acres and are managed for conservation objectives, mostly through custodial methods. Administrative and land-use designations of various kinds are in place for the balance of National Forest System acres, which roughly zone forestland on the basis of primary management objectives. Recent years' decisions generally have allocated more of these designations toward conservation purposes, and away from timber production purposes. For instance, almost all the forest stands in Western Washington that are 150 years and older are on federal lands, indicating a management priority for maintaining mature and old forest structure. Not coincidentally, the National Forest System's share of timber harvested in Washington State has shrunk from 11 percent in the 1990s to 1 percent currently. Watershed and forest ecosystem restoration — along with recreational use —has, tacitly and explicitly, become the prevailing management objective on the National Forests.

Three units account for the majority of Washington's forestland that is managed within the National Parks System: Olympic National Park, Mount Rainier National Park, and North Cascades National Park (including Lake Chelan and Ross Lake National Recreation Areas). For each of these spectacular and diverse landscape, federal statute and regulations require that National Parks are managed, "to conserve scenery, natural and historic objects, and wildlife, and to provide for the enjoyment of those resources in a manner that will leave them unimpaired for the enjoyment of future generations." In addition to Parks designation, significant shares of Olympic, Mount Rainier and North

Cascades units are congressionally designated Wilderness. Mount Rainier National Park, for instance, is 97 percent Wilderness. Individual parks develop management plans to balance their stewardship of natural resources with recreational visitation and specific uses.

STATE FOREST LAND MANAGEMENT

The state Department of Natural Resources manages 2.1 million acres of forested state trust lands and 101 thousand acres of forested conservation areas, the Department of Fish and Wildlife manages nearly 95 thousand acres of forested wildlife areas, and 67 thousand forested acres are managed as Washington State Parks. In total, state-managed forests comprise about 13 percent of all forestlands in Washington (Figure i3). The diversity of forest ecosystem types, management objectives and uses varies widely among these holdings.

DNR state trust lands are working forests held in trust and managed to produce revenue for statutorily-prescribed beneficiaries. The revenues generated from timber management and leasing activities are used to provide funding to build the state's public schools and universities, correctional institutions, and State Capitol buildings in Olympia. Some provide funding for county services in which those particular trust lands are located, or contribute to the general fund, earmarked for education. The department must manage trust lands in a manner that will preserve their health and productivity in perpetuity, while providing the greatest return to the beneficiaries, and offering other benefits such as for recreation, where appropriate. As compared to other revenue-generating entities like industrial landowners, forested state trust land management incorporates more public conservation objectives. Management of forested state trust lands in Western Washington includes longer harvest rotations and retention of more legacy forest structures, stronger riparian forest restoration and protections, and includes policies to conserve, manage and protect old-growth forests. Eastern Washington state trust forests are managed to conserve forest health and restore ecologically appropriate mixes of tree species for the dryer conditions, including older forest conditions. Each of these objectives is still achieved within a sustainable harvest and revenue-generating mandate.

The DNR Natural Areas Program manages 101 thousand acres of forestland in two conservation designations: Natural Area Preserves, and Natural Resource Conservation Areas. The Natural Areas were created to protect outstanding examples of the state's extraordinary ecosystem diversity. These lands represent the finest natural, undisturbed ecosystems in state ownership, often protecting one-of-a-kind features which are unique to this region. Preserves protect the best remaining examples of many ecological communities including rare plant and animal habitats. Conservation Areas protect outstanding examples of native ecosystems, habitat for endangered, threatened and sensitive plants and animals, and scenic landscapes. Management plans are developed

for each Natural Area to guide action necessary for the protection of natural features. Management plans for Natural Area Preserves address a range of activities including: prescribed burning to restore ecosystems that are dependent on fire; controlling invasive species that threaten the special features; boundary and interpretive signing; restoring native species if necessary; and fencing to prevent damage from domestic animals.

State Department of Fish and Wildlife forested wildlife areas are managed to provide habitat for fish and wildlife as well as land for outdoor recreation activities, wildlife viewing, hunting and water access points that are compatible with fish and wildlife stewardship. Management plans developed for each Wildlife Area identify specific management objectives for each complex and strategies for achieving them. Several large wildlife areas in Eastern Washington, such as the Wenas, L.T. Murray, Oak Creek, and Sinlahekin, contain forestland and are intermingled or adjacent to forested DNR and federal public lands. Their management has included active habitat and ecosystem restoration measures such as tree thinning and prescribed fire.

The mission of Washington State Parks is to "acquire, operate, enhance and protect a diverse system of recreational, cultural, historical and natural sites" in an effort to leave a valued legacy to future generations. Most state park units are small and dispersed, containing primarily developed recreation facilities. Forest management objectives include preserving the visual appeal of a natural outdoor setting, and maintaining safety for visitors. Some larger forested parks, such as Mount Spokane and Riverside State Parks, are managed for forest health and wildfire hazard reduction in concert with their recreational uses.