

**SITUATION ASSESSMENT
DONE FOR THE
FEDERAL FORESTLANDS ADVISORY COMMITTEE**

EXECUTIVE SUMMARY

Opinion polling shows that Oregonians are very concerned about many forest issues including water quality, fish and wildlife, jobs and revenues, wildfire, and forest health. Polling also shows that people want a balance of goods and services from federal forests. Most people agreed that national forests should provide for as much diversity of plants and animals as possible, however a majority of people also support timber harvesting on national forests if it is not from old-growth forests, and are concerned about the loss of family wage jobs in rural communities.

Forestland ownership in western Oregon is 52% federal, 42% private and 5% state. In eastern Oregon forestland ownership is 73% public and 27% private. Overall in Oregon, about 35% of all forestland is in reserves where lands are managed primarily for non-timber values, 35% is in wood production, and 30% is in a multi-resource land allocation where production of timber and other values are balanced.

Forests provide important wildlife habitat. Forest service plot data shows that the amount of old-growth forest on all forestlands decreased by 65% from the 1930's and 40's to the early 1990's. Since completion of the Northwest Forest Plan in 1994, the amount of older forest has increased on federal lands, and is projected to continue increasing under current policies. Oregon Department of Fish & Wildlife (ODFW) developed a Conservation Strategy intended to provide a long-term, big-picture "blue print" for conserving Oregon's wildlife. It presents issues and opportunities, and recommends voluntary actions that will improve the efficiency and effectiveness of conservation in Oregon.

Federal timber harvests have been declining with the designation of late successional reserves, riparian reserves, and other land allocations that are out of the timber base. Timber harvest levels that can be sustained on public lands under current management allocations and restrictions are about 20% of historic harvest levels and about half of what was projected in major planning efforts. Private timber harvests have been relatively stable, but are threatened by declining log markets and development.

Forest health is a major issue in many parts of the state. There are currently about 20 million acres of forestland in Oregon, where fires historically burned frequently, that are now overstocked and in danger of losing key ecological components to uncharacteristically severe wildfire. Overstocked forest stands are also more susceptible to damage from insects. Non-native invasive species are a problem on both public and private lands. On forest service lands in Region 6 there are more than 300,000 acres infested with invasive species.

Air and water quality are important forest issues. Air quality can be severely impacted by smoke from wildfires and prescribed burning. A Department of Environmental Quality study of water quality on federal forestlands shows that 16% of wadeable streams did not meet the fine sediment benchmark, and 77% of wadeable streams exceeded Oregon's temperature benchmark.

Climate has been warming since the end of the "little ice age" about 1860. We are observing increased rare wildland fire conditions like extreme wildfire events, lengthened wildfire seasons, and large-scale wildfires in fire-sensitive ecosystems. Climate change may combine with wildfire to dramatically alter forests. Fire may become the primary agent of forest changes leading to wholesale conversions of some habitat types.

Societies need both forests and forest resources, and people have many values related to forests that can be in conflict with each other. The forest sector is important to Oregon's economy. Between 1980 and 2003 Oregon lost more than 250 mills and 24,000 jobs in the forest industry hurting many rural communities. A large majority of the distressed counties and cities in Oregon have historic ties to the forest industry and have experienced job losses and associated social problems due to mill closures.

INTRODUCTION

The Federal Forestland Advisory Committee (FFAC) is developing a draft vision for how federal forestlands can better contribute and support Oregonians' economic, social, and environmental values. The purpose of this document is to provide the FFAC with information on the conditions, trends, and concerns over the management of forest resources.

PUBLIC ATTITUDES

Public attitudes toward forest resources in Oregon provide important context for the FFAC's vision. Oregonians value a variety of economic (jobs 30.8%), environmental (habitat 23.3%), and social (drinking water 22.8%, recreation 14.8%) goods and services produced from the forest (Mercury Public Affairs, 2006). People are very concerned about many forest issues including water quality, fish and wildlife, jobs and revenues, wildfire, and forest health.

Water quality is among the top public concerns in many surveys. Ninety-one percent of Oregonians are very or somewhat concerned about the protection of water quality during forest operations. Leaving streamside buffers and requiring forest managers to minimize erosion were the top remedies cited for improving water quality (Davis, et. al., 2006).

Providing fish and wildlife habitat is an important public goal for national forests. Eighty-eight percent of people agreed, or strongly agreed, that national forests should provide for as much diversity of plants and animals as possible (Institute for a Sustainable Environment, 2002).

Public attitudes toward timber harvesting on federal lands to provide jobs and revenues are more divided. A majority of people (54%) believe that old-growth forests should not be harvested in order to provide ecosystems for wildlife like spotted owls and salmon, but a substantial minority (32%) disagrees. When the question is turned around, a majority of people (53%) support harvesting timber on national forests if it is not in old-growth forests, and again a substantial minority (29%) disagrees (Institute for a Sustainable Environment, 2002). Many rural economies are dependent on timber. The public sees lack of family wage jobs (76%), other Americans wanting to shut down natural resource economies (62%), and damaging government policies (51%) as serious problems facing Oregon's rural communities (Davis, et. al., 2001).

Wildfire and forest health are major issues for many Oregonians, especially those living in the fire prone areas of southwest, central, and eastern Oregon. The vast majority of people agree with using both prescribed fire (83%) and thinning (88%) to reduce excess fuel in crowded forests (Davis, et. al., 2001).

Roadless area preservation is another issue on federal forestlands. People were polled about the proposed 2001 Roadless Rule with the following question: Half of the National Forest lands in the United States have already been logged, mined, have roads and remain open to commercial development. An additional 18 percent are permanently protected, and the remaining 31 percent are unprotected, wild, roadless areas. The Clinton administration has proposed to protect nearly all of these remaining unprotected wild areas. This means that they could be used for most types of recreation, including hunting, camping and fishing, but that logging, new roads, mining, oil drilling and off-road vehicles would be prohibited. Do you support or oppose this proposal? In Oregon, 67% responded in support to the question and 27% opposed.

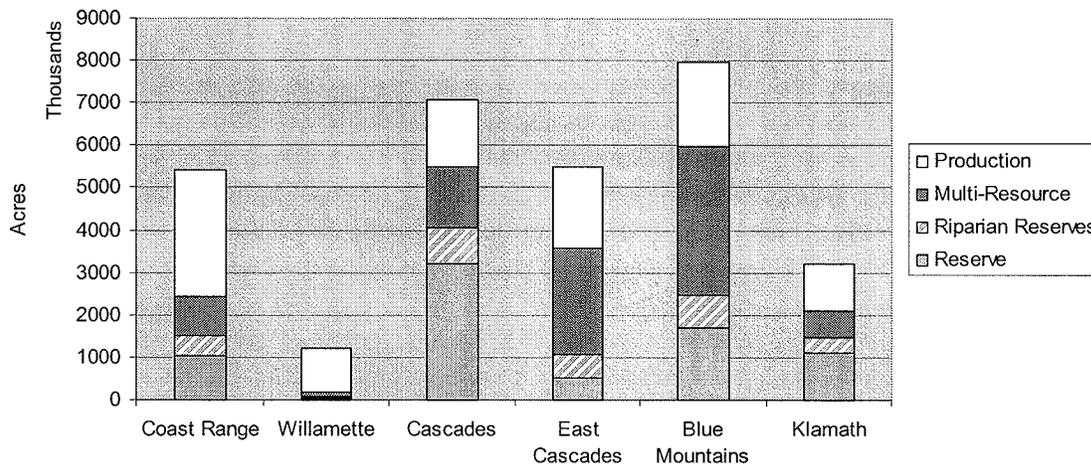
Polling shows that people want a balance of goods and services from federal forests. By a margin of 82% to 8% people agree that national forests should be managed to balance timber harvest, wildlife conservation, recreation and other forest values (Institute for a Sustainable Environment, 2002). However, Oregonians are deeply divided about whether balanced forest management is occurring. Forty-two percent feel that things are balanced, while 40% believe things are out of balance (Davis, et. al., 2001). When asked what the balance should look like on federal lands, Oregonians answered placing 40% of the emphasis on water quality and wildlife, 29% on growing forest products, and 32% of the emphasis on meeting a wide range of social needs including employment, recreation, and revenues to support healthy rural communities (Davis, et. al., 2001). When asked, "How much of Oregon's forestland do you think is off limits to logging--and instead is being managed for old growth, wildlife, recreation, or some other purpose not connected to timber harvesting?", their mean response was 36%. However, 39% did not have a response to the question. Of the respondents who offered an "off limits" estimate of between 31%-40%, 46% felt this was the right amount, 21% too much, and 30% too little.

LAND OWNERSHIP AND ALLOCATION

The federal government manages the majority of the forestland in Oregon. In western Oregon the major landowner classes include federal (52%), private (42%) and state (5%). In eastern Oregon federal lands are even more important. The forest service manages 72% of all forestlands and about ¾ of the land capable of producing commercial crops of timber.

Forest management philosophy encompasses three major strategic approaches, each with a different intensity of management and directed at yielding a different set of outcomes. These approaches have been called by a variety of terms. Here we are using a system developed for the Oregon Board of Forestry and calling the land allocation categories *reserve*, *multi-resource*, and *wood production* forests. These three strategic approaches work in concert with one another toward achieving sustainability across the forest landscape (see Appendix A for full descriptions of the categories and land allocations in them).

Figure 1 – General land allocation by category



Ecoregions denote areas within ecosystems where the type, quality, and quantity of environmental resources are generally similar. In evaluating the condition of a wildlife or plant species, it is essential to know the natural geographic range of the species. The geographic range of a species represents the broadest possible area where a species can exist, and is generally determined by major environmental patterns such as ecoregion, climate, and elevation. Figure 1 shows that all the major forested ecoregions in Oregon (the Willamette ecoregion is dominated by non-forestland) have significant proportions of their total forestland bases in reserves and riparian reserves, with the Klamath Mountains and Cascades ecoregions having more than half of all forestland in reserves. Wood production lands are primarily found on private lands. Only the Coast Range ecoregion has more that half of its land in the wood production allocation. The East Cascades and Blue Mountains ecoregions have the majority of their land in the multi-

resource category. However, this is misleading because a large percentage of this land is not considered suitable for commercial timber production and harvests will only be done by thinning stands to improve forest health. Overall in Oregon, about 35% of all forestland is in reserves, 35% is in wood production, and 30% is in a multi-resource land allocation.

FOREST SUSTAINABILITY

Opinion polls consistently show that people want a full range of economic, social, and environmental goods and values produced from forests. At the 1992 United Nations Conference on the Environment and Development, the United States committed to using our forests sustainably. Following that conference, through the Montreal Process, a group of 12 countries with 90% of the world's temperate forests have agreed to use a common framework to describe forest sustainability. The seven Criteria are like goals that define the essential elements of sustainable forest management. These include conservation of biological diversity, maintenance of productive capacity, forest ecosystem health and vitality, conservation of soil and water resources, maintaining forest's contribution to global carbon cycles, providing socioeconomic benefits, and creating the legal and institutional framework necessary for sustainable forest management. This situation assessment uses the first six criteria as an organizational tool to describe the conditions and trends of forest resources that need to be sustained.

Maintain Plant and Animal Populations (Biodiversity)

Late-successional and Old-growth Forest

Old-growth is a value laden concept that is very difficult to define, and many different studies have produced conflicting estimates of the extent of old-growth forests. Definitions generally use attributes like age, size, canopy layers, and dead wood to describe late-successional or old-growth forests. Definitions also vary by forest type, site productivity, and region.

Several estimates of the amount of old-growth forest in Oregon have been made. These include acres of old-growth forest by Congalton et. al. (1993) and acres of ancient forest by Morrison et. al. (1991) on individual national forests.

Table 1 – Estimates of Old-growth (Congalton) and Ancient Forest (Morrison) in Oregon

National Forest	Congalton et. al.	Morrison et. al
Mt. Hood	363,250	334,500
Willamette	783,550	605,000
Siuslaw	91,860	133,700
Umpqua	619,340	306,300
Rogue	267,950	150,100
Siskiyou	277,890	332,400
Sum	2,403,840	1,862,000

Forest Area by Size Classes in Reserves

Figure 2, based on remote sensing and GIS analysis, shows the size classes and general land management categories for all forestland in eastern Oregon. Less than 1 percent of the forest is in stands greater than 30 inches dbh (42,131 acres), 5 percent is in stands between 20 and 30 inches dbh (549,931 acres), and 15 percent of stands are between 15 and 20 inches dbh (1,677,320 acres). About 18 percent of forests greater than 15 inches dbh are in reserves, 54 percent are in multi-resource, and 28 percent are in wood production allocations.

Figure 2 – Forest Area by Size Class and Land Allocation Category in Eastern Oregon

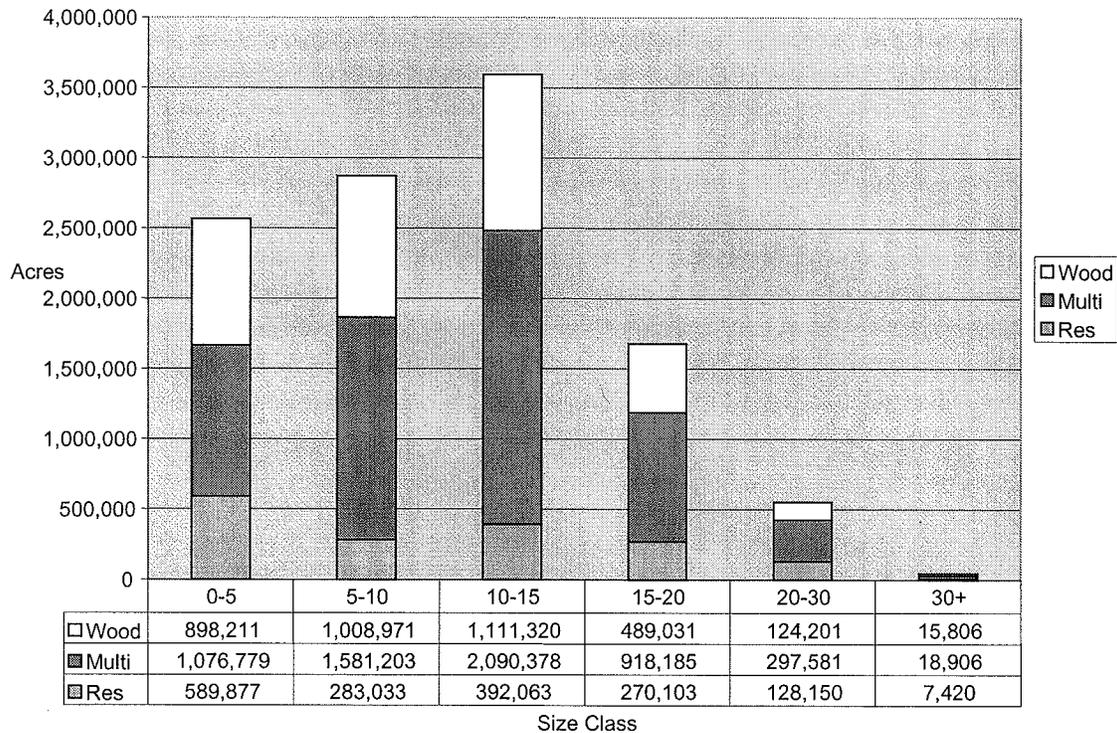
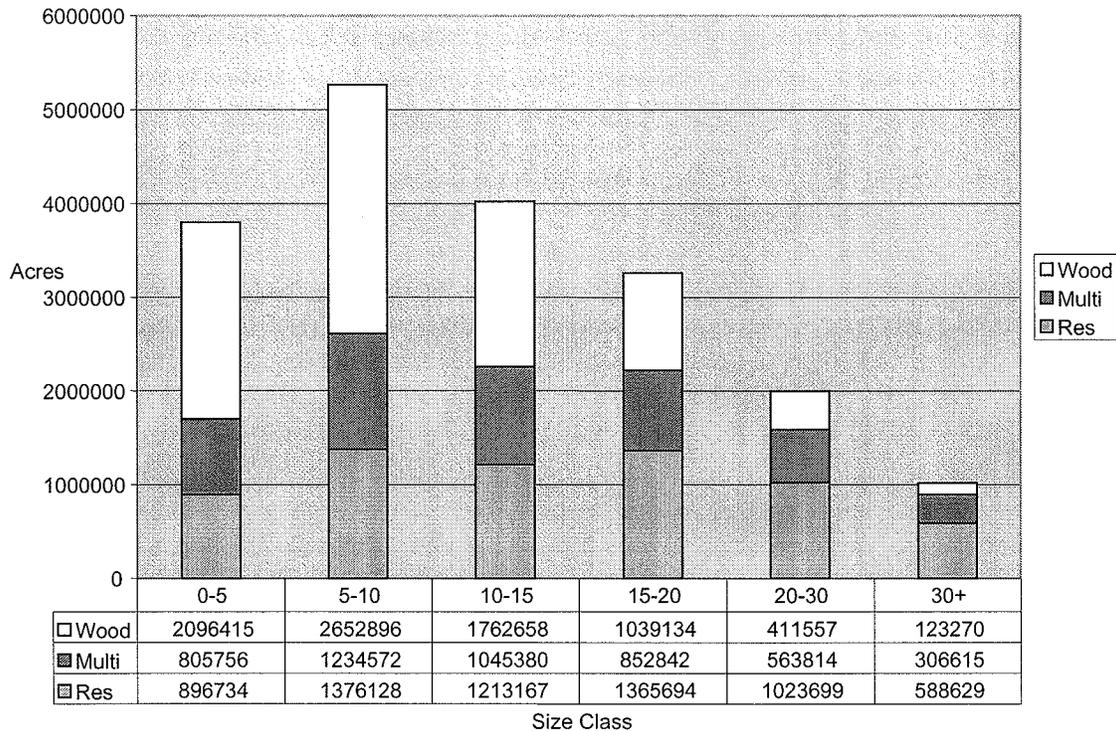


Figure 3 shows the size classes and general land management categories for all forestland in western Oregon (based on remote sensing and GIS analysis). About 5 percent of the forest is in stands greater than 30 inches dbh (1,018,515 acres), and 10 percent is in stands between 20 and 30 inches dbh (1,999,071 acres). About 45 percent of forests greater than 20 inches dbh are in reserves, 27 percent are in multi-resource, and 28 percent are in wood production allocations.

Figure 3 – Forest Area by Size Class and Land Allocation Category in western Oregon



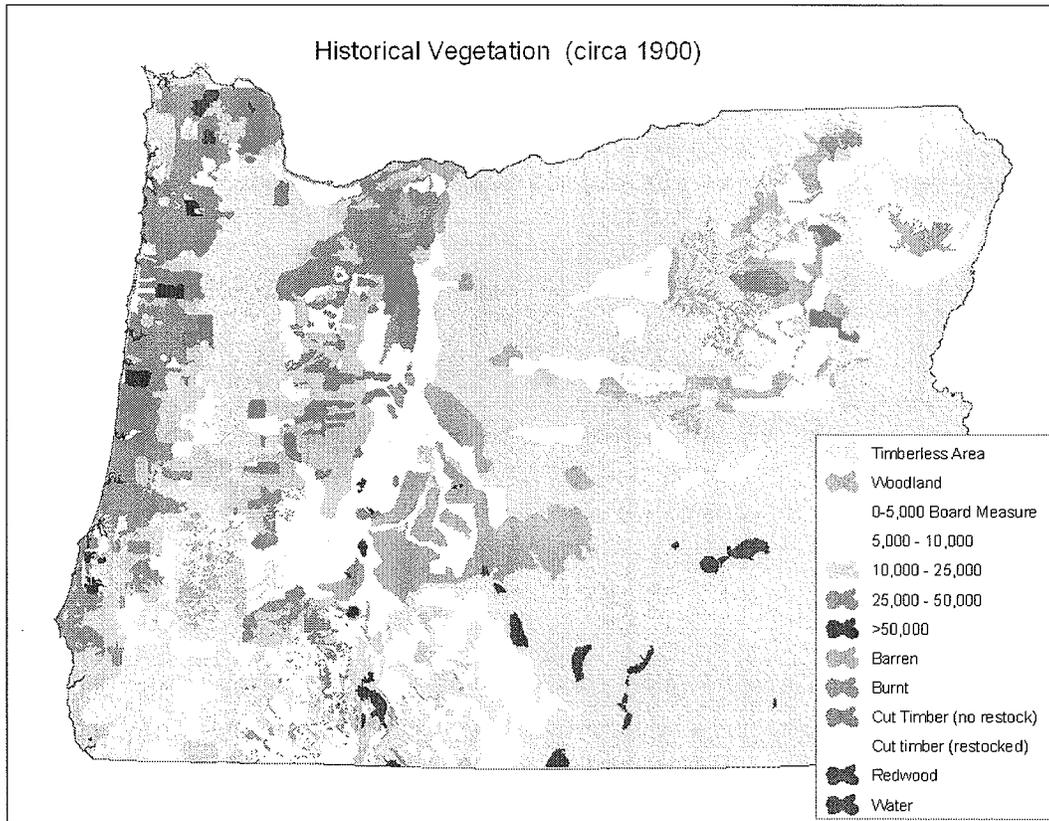
Trends in Old-growth Forest

The total amount of forestland and the percentage that was old-growth before Europeans settled in Oregon is unknown. Wimberly et. al. (2000) modeled the historic variability of late-successional and old-growth forest in the Oregon coast range. The models used in the study created estimates of fire frequency, high and low fire severity, and fire size. The simulations estimated that the percentage of old-growth forest was generally between 25% and 75% of the forest landscape. They estimate that the coast range currently contains about 5% old-growth.

The first inventory of Oregon’s forests was conducted by the USGS in about 1900 (Hughes, 1902). The inventory uses a system call “Board Measure (BM),” not Board Foot Scribner (bf), to determine volume. Because of the differences in measurement system and differences in merchantability standards, it is difficult to compare the data with current inventories; however, the data provides several insights into historic forest conditions (Figure 4). Large stand replacing fires burned in the coast range and cascades. Thirty-six percent of the forest area in the Coast Range Ecoregion and 25

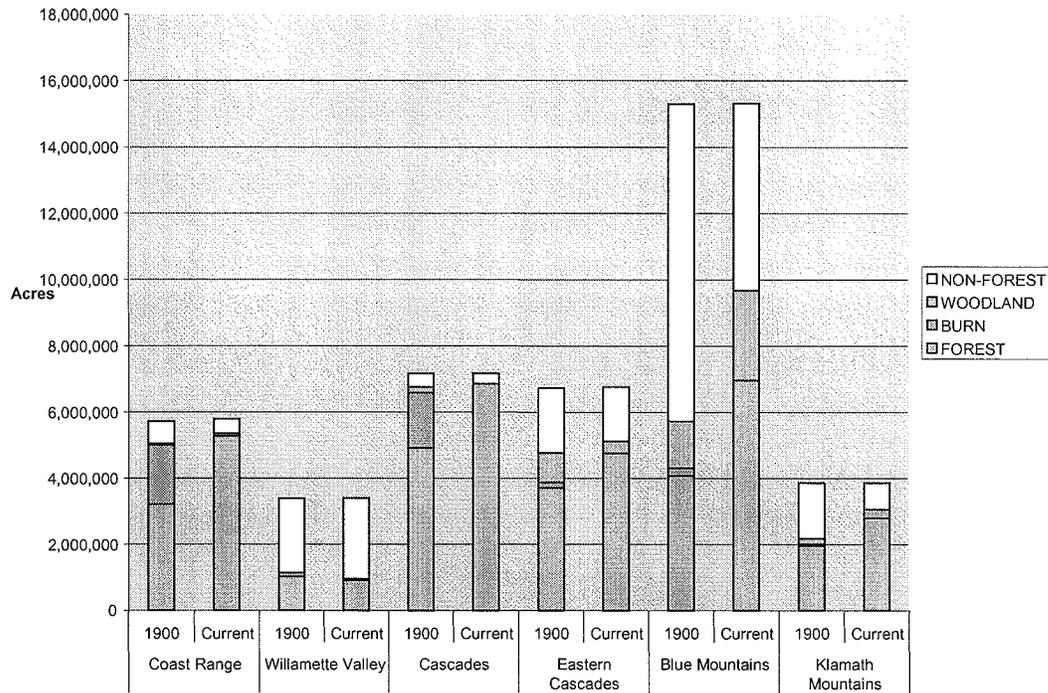
percent of the forest area in the Cascades Ecoregion was regenerating and did not contain merchantable timber volume. In the southern and eastern parts of the state, where fires were more frequent and less intense, timber volumes were lower and large portions of the landscape were non-forested. Figure 4 also shows that timber volume was not evenly distributed over the landscape. The landscape was a patchwork of different forest sizes and densities. About 79% of the forest area had some merchantable timber volume. Forty-five percent had greater than 5,000 BM/ac – which is fairly consistent with estimates of old-growth from the 1930’s (Bolsinger and Waddell, 1993) – and 25 percent of the forest had greater than 10,000 BM/ac.

Figure 4 – Historical Vegetation Circa 1900



Comparing the historic 1900 map with maps from recent satellite imagery provides general information on forest changes that have occurred over the last century (Figure 5). In ecoregions with longer fire return intervals (Coast range, Willamette Valley, Cascades), the area covered by forests has remained relatively stable. However, in ecoregions with frequent fires (East Cascades, Blue Mountain, Klamath Mountains), forests have filled in areas that were historically open and the total amount of forest and woodland has increased. Figure 4 also shows that in these ecoregions, timber volumes were relatively low historically (less than 5,000 BM); frequent fires removed young trees and kept many stands relatively open grown.

Figure 5 – Comparison of 1990 Mapped Data with Recent Satellite Image Maps by Ecoregion



Bolsinger and Waddell (1993) used Forest Service plot data to estimate the amount of forestland and percentage of old-growth in 1933 to 1945 and again in 1992 (Table 2). According to their figures the amount of old-growth decreased by 65% from the 1930's and 40's to the early 1990's.

Table 2 – Productive forest land and old-growth forest area in Oregon

Years	Forest (Millions of Acres)	Old-growth (Millions of Acres)	Percent
1933 – 1945	26.7	14.2	53.2
1992	23.9	4.9	20.5

On federal lands across the entire range of the northern spotted owl, Moeur et. al. (2005) monitored the change in older forests over the first 10-years of the NW Forest Plan (1994 – 2003). At the beginning of the plan they found “from 7.87 million ac (\pm 1.96 million ac) of federally managed lands with average tree size at least 20 in (medium and large older forest), to 7.04 million ac (\pm 1.93 million ac) using a definition that recognizes variation in regional forest vegetation (older forest with size indexed to potential natural vegetation zone). We found 2.72 million ac (\pm 0.35 million ac) were in stands with average tree size 30 in and greater, with multistoried canopies (large, multistoried older forest).”

Moeur et. al. (2005) found an increase in older forest on federal lands over the last 10-year period. Medium and large older forests had a net increase of about 1.9 percent. Older forest losses to harvesting were about 0.2 percent and losses to fire were about 1.3 percent. Analysis from the CLAMS project (Spies and Johnson, 2007) shows that under current policies, older forests will continue to increase on public lands over the next century.

Critical Habitat vs. Reserves

There are about 4.6 million acres of critical habitat designated for threatened and endangered species in Oregon, more than 99 percent of which is either designated for spotted owls, marbled murrelets, or both. About 82 percent of critical habitat is on federal lands, four percent is on state lands, and about 13 percent is on private lands. About 75 percent of the critical habitat on federal lands is in some type of reserve status.

Oregon Conservation Strategy

The Oregon Department of Fish and Wildlife (ODFW) conducted a comprehensive review of Oregon's, fish, wildlife and their habitats, in 2005, the Oregon Conservation Strategy (ODFW, 2006). The goals and scope of the Conservation Strategy include: maintain healthy fish and wildlife populations by maintaining and restoring functioning habitats, preventing declines of at-risk species, and reversing any declines where possible.

The Conservation Strategy is intended to provide a long-term, big-picture "blue print" for conserving Oregon's natural resources to maintain or improve environmental health for today and for future generations. It outlines how and where the state and its conservation partners, including landowners and land managers, can best focus this work. The Conservation Strategy is not regulatory. It works within existing legal structure and is not a substitute for existing regulations or planning efforts. It synthesizes and builds upon existing efforts to promote a statewide framework for action.

The Conservation Strategy presents issues and opportunities, and recommends voluntary actions that will improve the efficiency and effectiveness of conservation in Oregon. Six key statewide conservation issues were identified and include: 1) land use changes; 2) invasive species; 3) changes in disturbance regimes (fire, flood); 4) barriers to fish and wildlife movement; 5) water quality and quantity; and 6) institutional barriers to voluntary conservation.

The strategy also includes an ecoregional approach to conservation. For each ecoregion characteristics of ecology and economy were used to identify strategy species and habitats, conservation issues and actions, and provide examples of successful collaborative conservation efforts. The strategy also includes Conservation Opportunity Area (COA) maps that identify some issues on federal lands.

Conservation Opportunity Areas (COA's): prioritize landscapes where fish and wildlife conservation goals can best be achieved, increase likelihood of long-term success over larger areas, improve funding efficiency, promote cooperation across land ownership boundaries.

The Conservation Strategy also includes:

- 11 Strategy Habitats. Statewide: aquatic, riparian, wetland. Ecoregions: aspen, coastal dunes, estuaries, sagebrush, grasslands, late-successional mixed conifer, oak, ponderosa pine.
- 286 Strategy Species: 17 amphibians, 62 birds, 65 fish, 59 invertebrates, 18 mammals, 60 plants, and 5 reptiles; some are statewide, others in one or more ecoregion; limiting factors, special needs, data gaps, and recommended actions listed for each species.

The FFAC can use the Conservation Strategy: *as a reference* (4 scales of planning, background information on Oregon's habitats and species); *for priorities* (lists conservation issues and actions that will help fish and wildlife, identifies important landscapes [COA's] and habitats to focus investments); *for data sharing* (data layers available for COA's, species distribution, habitats); *to build partnerships* (identify broad approaches across ownership boundaries); *to measure success* (through collaborative initiatives, such as the Registry of Conservation Actions and Fish and Wildlife Monitoring Team).

Maintain Productive Capacity – Economic Well-Being

Timber and forest products are very important to Oregon's economy. Many factors influence the capacity of Oregon's forests to sustain commercial production of various forest products, but a stable forest landbase devoted to growing and harvesting timber is prerequisite to sustaining any timber harvest level. The private land base available for timber production has been relatively stable since county land use plans were implemented in the mid-1980's. Private timber harvests have also been relatively stable over the past 20 years. Statewide, timber harvests are at a level that can be sustained (Sessions et. al., 1989); private harvests are also at a level that is close to the maximum biological potential that can be produced from the private land base.

However, changes in federal policy can have a direct effect on the stability of the private land base devoted to timber production. In central and eastern Oregon, where forestland ownership is 74 percent federal and federal timber harvests have declined, the stability of the private forest landbase is beginning to erode. Forest service timber harvests in eastern Oregon have declined to about 11% of their historic level (Average of 1.14 billion bf 1962 - 1991). Between 1988 and 2007 the number of sawmills in eastern Oregon has declined from 42 to 12. Smaller markets reduce competition for logs resulting in lower prices and fewer mills have caused increased hauling distances that combine to reduce profits for landowners. As mills tried to stay in business, private timber in eastern Oregon has been harvested above the sustainable rate and growing stock has been severely reduced.

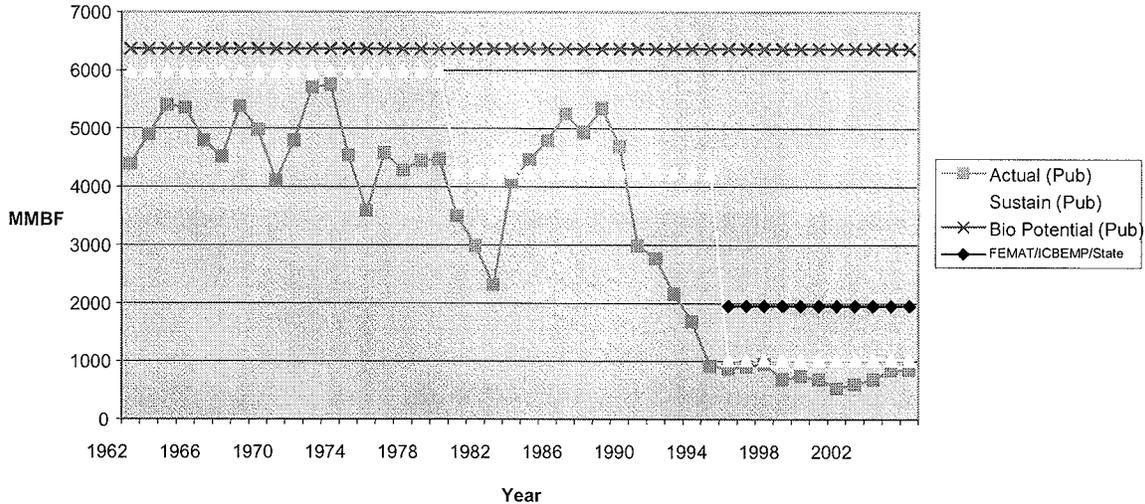
Forest products companies are now reluctant to invest in eastern Oregon and large tracts of timberland, once owned by the forest industry, are being sold to people with little background in forestry or being developed for other uses. Central Oregon is a good example of the kind of changes that are starting to occur. In Jefferson County over 60% of the industrial forestland has sold since 1990. The former Kinzua lands in Wheeler County have been sold to Flagstar Bankcorp. Public access is now restricted and the lands are no longer being actively used to produce timber. Weyerhaeuser sold 27,750 acres of timber land to Holiday Retirement Corp which is planning to convert the land into a destination resort. Other forestlands in Deschutes County, formerly owned by Crown Pacific, are being divided into large lots and sold for residential uses.

Dividing the forest into smaller parcels and adding dwellings can seriously reduce the values that the forest provides by displacing wildlife, increasing conflicts between residential and commercial uses, increasing the cost of fire protection, and reducing commercial timber production. Forest fragmentation displaces wildlife by reducing the total area of contiguous forest, introducing non-native invasive species, and isolating the remaining forest patches. This can lead to removal of the top predators, an increase in the number of small to mid-sized predators, and in some places large increases in the number of herbivores. The results of fragmentation can be over-browsing and removal of certain plant species, increased predation and nest parasitism, a reduction in the number of ground-nesting birds and other species, plus a general reduction in certain types of wildlife habitats (Patel-Weynand, 2002).

Eastern Oregon may be approaching a “tipping point” where timber harvest falls below the level needed to maintain a viable forest industry. Loss of the skilled labor force and forest industry infrastructure would make it difficult to conduct fuel reduction thinning or other management activities needed to improve forest health. Without a viable forest industry, landowners are unlikely to invest in working forests and land uses are more likely to change toward increased residential uses. In turn this will lead to loss of public access for recreation, decreases in some types of wildlife habitats, and increases in wildfire risk and protection costs.

Statewide, with the designation of late successional reserves, riparian reserves, and other land allocations that are out of the timber base, public land devoted to timber production has significantly declined since the 1980’s. Timber harvest levels that can be sustained on public lands under current management allocations and restrictions (Figure 6) are about 20% of historic harvest levels and about half of what was projected in major planning efforts (FEMAT, ICBEMP, and State plans).

Figure 6 – Timber Harvest on Public Lands Compared to Biological Potential and Projected Sustainable Levels under Different Plans



Another way to look at whether timber harvests can be sustained is by comparing growth and harvest levels. Net growth has substantially exceeded harvests on forest service lands since the 1950's. This is most dramatic in the inland west where less than 10% of the net volume growth has been harvested during the last 20 years. Between 1993 and 2004, on non-Congressionally withdrawn federal lands, timber harvest has been about 4% of total growth in western Oregon and 10% of total growth in eastern Oregon. During the same time period, mortality on federal lands was 26% of total growth in western Oregon and 44% of total growth in eastern Oregon (Hovee, 2005).

Maintain the Health of Forest Ecosystems

Disturbances such as fires and windstorms are key ingredients that shape the forests, contribute to species diversity, and control the relative abundance of individual species across the landscape. Fire suppression, timber harvesting, development, agriculture, and grazing can change the processes that have shaped Oregon's forests, and can lead to forest health problems.

There are currently about 20 million acres of forestland in Oregon, where fires historically burned frequently, that are now overstocked and in danger of losing key ecological components to uncharacteristically severe wildfire. Some forest stands which historically had 50 to 100 trees per acre now have as many as 500 or 1000 trees per acre. When fires burn in overstocked stands they are much more likely to climb into the crowns of the trees and consume the entire forest, rather than staying on the ground, thinning the forest from below, and removing fuels that have accumulated on the forest floor. This is an extremely large problem that continues to get worse with time.

Overstocked forest stands are more susceptible to damage from insects. Crowded trees lack the water and vigor to fend off insects like bark beetles. During drought conditions in the late 1990's and from 2002 through 2005, insect activity was at epidemic levels in eastern Oregon. Aerial detection surveys show an almost eight-fold epidemic increase in tree death in the area along the eastern slopes of the Cascade Mountains during 2004. During epidemics, widespread tree mortality alters the forest ecosystem. Often, beetles have almost totally depleted commercial pine forests and, in some cases, have converted valuable forests to less desirable timber species, such as subalpine fir. Sometimes, forested areas are converted to grass and shrubs. The profusion of beetle-killed trees can change wildlife species composition and distribution by altering hiding and thermal cover and by impeding movement. Insect activity has left a legacy of dead trees, and increased fire danger, across hundreds of thousands of acres of forestland in Oregon, and the vast majority of this is on federal lands.

The introduction and spread of non-native invasive species is a problem on both public and private lands. On forest service lands in Region 6 there are more than 300,000 acres infested with invasive species. Some of the problems associated with invasive species include:

- Changes in fire frequency, leading to type conversions of habitat (cheatgrass, Arundo)
- Changes in nutrient cycling (cheatgrass, knotweed)
- Toxicity to livestock (tansy ragwort, yellow starthistle)
- Loss of forage quality and quantity for big game (leafy spurge, knapweeds, yellow starthistle)
- Invasive shrubs acting as a population sink for native birds due to increased predation of nests within invasive shrubs (buckthorn)
- Changes in stream and river hydrology (knotweed, blackberry)
- Loss of nesting habitat and increased nest predation on endangered snowy plovers (European beachgrass)

Changes in disturbance regimes from fire suppression, selective timber harvesting practices, development, invasive species, and grazing have combined to create forest health problems across large areas of the state. To treat the overstocked acres on non-wilderness, non-roadless public lands over a 20 year period would require treating 559,000 acres per year. Preliminary data from the Forest Inventory shows a significant decline in the volume of large Ponderosa pine in excess of 21" dbh. Even with the current restrictions on harvesting large trees, we may be losing that component of the forest due to forest health problems.

Recent studies have shown an estimated 4.25 million acres (about 15% of Oregon's forestland) have the potential to provide useful woody biomass through thinning to reduce the risk of uncharacteristic forest fires. Most of these overly dense forests are federally owned and managed. The best short-term use for woody biomass might be as fuel for generating electricity and heat used in wood products manufacturing. A potential long-term use is converting woody biomass to biofuels and bioproducts to replace fossil fuels. Most of the net woody biomass supply in Oregon is in the eastern and interior

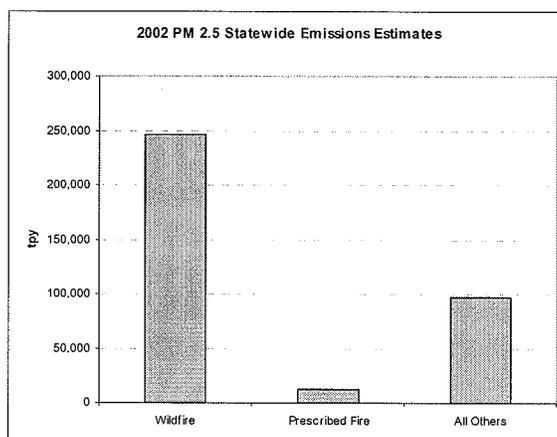
southwestern regions of the state. Utilizing woody biomass for energy can restore forest health, fire resiliency and wildlife habitat; help meet Oregon's renewable energy goals, and provide hundreds of jobs and help revitalize rural communities. (*Biomass Energy and Biofuels from Oregon's Forests*, Oregon Forest Resources Institute, 2006).

Maintain and Improve Soil, Air, And Water Quality

Air Quality

Air quality can be severely impacted by smoke from wildfires and prescribed burning. DEQ monitors air quality and develops plans to make sure areas are in compliance with national ambient air quality standards. EPA revised the daily fine particulate standard in September 2006 from 65 ug/m³ to 35 ug/m³. Klamath Falls and Oakridge, Oregon are likely to be designated as nonattainment areas for the new standard, and several other communities are at risk of violating the standard. Oregon's Smoke Management Plan and rules are designed to keep smoke away from certain areas, including national parks and wilderness areas and smoke sensitive receptor areas. However, smoke intrusions do occur and the public health can be affected by this smoke. The 2002 data (Figure 7) indicates that 69% of the fine particulate emissions statewide, on an annual basis, were from wildfires and 4% from prescribed burning. To help prevent wildfires, one method to treat stands at risk in wildfire-prone areas is to increase the amount of prescribed burning and manage the smoke away from smoke-sensitive receptor areas. Increasing prescribed fire use requires developing more sophisticated smoke management forecasting techniques, improving emission inventories, using appropriate emission reduction techniques, and greater use of real-time monitoring equipment. Increasing biomass utilization (wood chipping and developing markets for fuel and energy production) should be the preferred alternative to prescribed burning wherever feasible, particularly in wildland urban interface areas.

Figure 7: Fine particulate emissions, 2002



Surface Water Quality

The Clean Water Act, section 303(d), requires periodic assessment of water quality conditions within the state to determine whether they meet the beneficial use needs of both present and future inhabitants. In the past, "number of river miles assessed meeting standards" has served as a benchmark of performance, but it has its limitations. The most recent water quality assessment (2002) suggests that there are impairments on federal lands due to temperature, sedimentation and toxics.

- 4700 stream miles due to high temperature
- 340 stream miles due to sedimentation
- 70 stream miles due to elevated levels of toxics.

It is important to note that the 303(d) listings are limited to water bodies with available data, and that severity of these water quality problems are not captured. The extent and severity of impairments for water bodies where data is not available is unknown. It is also important to note that many impaired streams that were on previous lists but have Total Maximum Daily Loads (TMDLs) in place are no longer on the 303(d) list.

USFS and BLM have Memoranda of Understanding and Memoranda of Agreement with DEQ that define the process by which the USFS, BLM and DEQ will cooperatively meet state and federal water quality rules and regulations.

BLM and USFS develop and implement Water Quality Restoration Plans (WQRPs) that describe what BLM and USFS will do when, where and how to protect and improve water quality to meet water quality standards and TMDL load allocations. DEQ reviews the WQRPs' sufficiency and also tracks implementation progress. DEQ also reviews Environmental Impact Statements and Environmental Assessments and provides comments on the sufficiency of the project design and BMPs used.

USFS and BLM developed the "Northwest Forest Plan (NWFP) Temperature TMDL Implementation Strategies" to explain how management under the broader objectives embodied in the NWFP Aquatic Conservation Strategy (ACS) can lead to meeting water quality standards and TMDL load allocations, and to provide specific management practices that help streamline the project planning process. DEQ granted conditional approval of this approach in 2005.

Oregon Plan data - DEQ studied water quality on federal forestlands within the Coho Evolutionarily Significant Unity (ESU--mainly in the Umpqua Watershed). Table 3 shows that on federal lands, these data indicate:

- 16% of wadeable streams did not meet the fine sediment benchmark
- 77% of wadeable streams exceeded Oregon's temperature benchmark

The Oregon Plan monitoring produced unbiased estimates of the ecological condition of stressors in streams within the Coho ESU.

Table 3: Percent Of Stream Miles That Fail To Meet Standards Or Benchmarks For The Factors For The Decline Of Coho

ESU	Temperature	Fine Sediment	Vertebrates	Macro-invertebrates
Federal Forest	77	16	18	16
Private Industrial Forest	43	45	33	33
State Forest	*	16	1	24
Agriculture	*	63	46	63

Aquatic and Riparian Effectiveness Monitoring Program – The 2005 Pacific Northwest Assessment of federal lands within the Northwest Forest Plan area aggregated road, vegetation and in-channel conditions to assess the condition of sixth field watersheds, to describe the distribution of watershed conditions in the Northwest Forest Plan area. The study focused on the effectiveness of the Aquatic Conservation Strategy, and indicated:

- 57% of watersheds showed improved conditions
- 40% of watersheds showed little change in condition
- 3% of watersheds showed a marked decrease in condition

Drinking Water Quality

High quality drinking water is an extremely important issue to Oregon citizens and contributes significantly toward achieving public health. Watershed protection and management, combined with effective water treatment and monitoring, are important steps in providing high quality drinking water to Oregonians.

In Oregon, approximately 75% of the municipal watersheds are forestlands. Of these, USFS manages 4.3 million acres and BLM manages 2.6 million acres. Federal agencies acknowledge their role in protecting municipal watersheds and have signed Intergovernmental Agreements with many local communities. From federal lands, municipal water providers are primarily concerned with sedimentation/turbidity and pesticides. For some providers, there are additional concerns about fire retardants. Even the best state-of-the-art drinking water treatment facilities cannot fully remove many of the commonly used pesticides and fire retardants. Implementing protective actions in sensitive areas, and minimizing the use of pesticides and fire retardants, can be effective in providing clean source water to public intakes and wells.

Pesticides and other Toxics in Surface and Groundwater

Toxics in streams and groundwater, including pesticides, herbicides and fire retardants, from forest management are a potential issue. There is insufficient data to adequately assess the occurrence and effects of toxics that were applied for forest management in

Oregon surface and groundwater. However, limited data do indicate that toxics were present at low concentrations in some forested streams.

An Oregon Department of Forestry study on pesticide spray drift and occurrence in streams found that seven out of the 25 post-spray samples had detectable levels of hexazinone and 2,4-D ester (ODF Reference). Another study (U.S. Geological Survey's NAWQA study of the Willamette Basin) found, "Forty-nine pesticides were detected in streams draining predominantly agricultural land. Forty-three of these pesticides were found in Zollner Creek, which has a drainage basin that is 99 percent agricultural. In contrast, 25 pesticides were detected in urban streams, and 23 of these were found in Fanno Creek, a basin in the Portland metropolitan area that is 92 percent urbanized. Herbicides were detected at twice the rate of insecticides in both agricultural and urban streams. Only atrazine and deethylatrazine were detected in streams draining forested basins (greater than 90 percent forest, by area), and these compounds were present at extremely low concentrations (0.002 to 0.004 µg/L)." (USGS Reference; <http://pubs.usgs.gov/circ/circ1161/index.html>). The USGS NAWQA data is useful but limited since the focus of the studies has not been on forested land uses, thus, the number of forested sampling locations is small relative to agricultural and urban sites. Further, USGS selected "undisturbed" sites that often were in forest lands to use as reference sampling sites, and not for the purpose of examining impacts of managed forests and harvesting.

Compared to agricultural and urban lands, samples from forest lands had fewer detectable and lower concentrations of pesticides. However, pesticide use on forest lands may be a threat to human health and aquatic life. Although herbicides are generally less toxic to humans and aquatic animals based on acute exposures, the chronic and sub-lethal threat and the effects from complex mixtures for pesticides and multiple stressors are not well characterized (Shuler et al., 2005; Hayes et al., 2006; Eggen et al., 2004) and further study is needed. There is little water quality data regarding fire retardants. Because of the extent of forest land management and the potential for toxics to be an issue in forest management, it is important to collect more information on stream and groundwater concentrations and assess whether forest management practices pose a threat to human health and aquatic life.

Enhance Carbon Storage – Climate Change

Climate has been warming since the end of the "little ice age" about 1860. Human activities have changed and are continuing to change the chemical composition of the atmosphere (International Panel on Climate Change, 2007). Many of these influences, such as fossil fuel burning, and land management activities, release greenhouse gases, which increase the amount of radiation absorbed by the atmosphere. The changes caused by these gases may further alter the climate. Forests can play a role in climate change by sequestering carbon, but equally important is the role climate change can have on our ability to sustain forests.

Oregon's forests contain about 1.8 billion metric tons of carbon. Oregon's forests store about 16 million metric tons of carbon per year through forest growth. Carbon is also stored in wood products. In general, the longer a forest rotation, the greater the amount of carbon stored (Krankina and Harmon, 2006). However, a short rotation, when combined with wood products substituted for high energy using building materials (i.e., concrete), will store more carbon than long forest rotations (Wilson, 2006).

Historical fire regimes have been disrupted, and climate change may combine with wildfire to dramatically alter forests. We are observing increased rare wildland fire conditions like extreme wildfire events, lengthened wildfire seasons, and large-scale wildfires in fire-sensitive ecosystems. Fire may become the primary agent of forest changes leading to wholesale conversions of some habitat types. We could see changes from dry temperate forests to grasslands, moist tropical forests to dry woodlands, and high-severity fires may eliminate entire forest types. This type of change would increase risks of species extinction, and reduce economic and social values derived from the forest.

To address the problem, fire ecologists and managers (Third International Fire Ecology and Management Congress, 2006) recommend that we:

- Identify fire-dependent or fire-sensitive ecosystems,
- consider climate change and variability when developing plans,
- consider alternate climate scenarios when determining post-fire vegetation management, and
- reduce uncharacteristic fuel levels.

Maintain Socio-Economic Benefits

Societies need both forests and forest resources, and people have many values related to forests, goods, and services. These values and needs can sometimes be in conflict with each other. Sustainable forest management must find a way to meet competing uses and demands in ways that reflect human values. Some values are direct, such as the production of commodities, source of employment, and source of income. Other values are indirect, such as education, scientific, knowledge, or spiritual uses. Resources that have little or diminishing value to people will inevitably be converted to other uses.

The forest industry is an important sector in Oregon's economy. In 2002 it produced \$12.8 billion or 6.9% of total industrial output. It also created 75,500 living wage jobs. The forest industry is even more important in many areas of rural Oregon. In 2001 it accounted for more than half of the traded sector employment in eight counties. Firms in the traded sector bring money from outside the local economy and create a base that supports local services and other local business.

Between 1980 and 2003 Oregon lost more than 250 mills and 24,000 jobs in the forest industry (Ehinger and Associates, 2003). Family income has a direct relationship to standard of living and is often used as an indicator for quality of life. Average earnings per job in the forest products industry are well above the state average and a very

Federal forests provide an important source of revenues to local governments in Oregon. Since the enactment of two compacts, one in 1908 and the other in 1937, Oregon counties have counted on revenue from the Forest Service and the Bureau of Land Management (BLM). This revenue compensates the counties for lost property tax revenues they would have otherwise received had the land been sold or transferred into private ownership. Historically, 25% of Forest Service and 50% of BLM timber revenues were shared with counties.

Because of harvest declines in the 1990's, Congress passed the Secure Rural Schools Act to replace this revenue. In total, more than \$250 million have been provided to Oregon counties annually since 2001 through the Secure Rural Schools Act. The bill expired in 2006 leaving the future of federal funding in doubt. This money is an important revenue source used by counties to support things like general funds, roads, and schools. In Douglas County about 2/3 of the general fund, more than 90% of county school fund, and more than 60% of the public works funds come from federal payments. In Wallowa County 57% of the roads fund and 74% of the schools fund comes from Forest Service payments. Dramatically decreasing federal payments to local governments in areas where local economies have already been hurt by reductions in federal timber harvests could cause severe social problems. The economic and social distress in rural communities has directly affected many people in Oregon.

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- Oregon's 2004/2006 Integrated Report Database. Information on water quality status for waterbodies in Oregon (303(d) list).
- Air Quality Index. Daily index of air quality for certain locations in Oregon.
- Laboratory Analytical Storage and Retrieval (LASAR) Database of Monitoring Data. 4.5 million grab data sample results and 40 million continuous data results. Air and water quality monitoring data from 1940's to date. Retrieve sampling data in a comma delimited file format.
- Pacific Northwest Water Quality Data Exchange. Various water quality monitoring databases throughout the Northwest. Retrieve sampling data in a common format.

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<http://www.deq.state.or.us/lab/wqm/wqimain.htm>

Water Quality Assessment: Oregon's 2004/2006 Integrated Report Database.
<http://www.deq.state.or.us/wq/assessment/rpt0406.htm> The 2004/2006 Integrated Report assessment database contains information on:

- Water quality status for water bodies in Oregon.
- Category 5 Water Quality Limited Waters needing a TMDL (2004/2006 Section 303(d) list)
- Water bodies that were removed from prior year 303(d) lists (de-listed)

Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP). Documents are prepared for waterbodies in Oregon designated as water quality limited on the 303(d) list (<http://www.deq.state.or.us/wq/assessment/assessment>). A TMDL is the calculated pollutant amount that a waterbody can receive and still meet Oregon water quality standards. The list of basins and watersheds with approved TMDLs can be obtained at the following website: <http://www.deq.state.or.us/wq/tmdls/basinmap.htm>

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APPENDIX A

Forest Land Management Classifications

1. **Nonforest** – land with <10% crown closure that has not previously been in forest use and has not been converted from forest to another use (Note: recent timber harvest units are forestland).
2. **Reserved Forest** (Forest Reserved for Conservation and Recreation) – includes land reserved from regularly scheduled timber harvest by law, regulation, or forest plan requirement. The primary purpose of the designation is to reserve the land for production of non-timber values. Forest management is used to produce wildlife, esthetic, or other values, and limited harvests may only be conducted when it will benefit those values (i.e., safety, maintaining wildlife habitat, etc.).
 - ◆ Includes: Administratively Withdrawn Areas, Congressionally Reserved Areas (Including - National Monuments, National Park, National Wildlife Refuges, Steens Mountain Cooperative Management and Protection Area, Wild and Scenic Areas, Wild and Scenic Rivers, and Wilderness Areas), Late-Successional Reserves, State and County Parks, Riparian Reserves (Federal), Special Areas (Includes: Areas of Critical Environmental Concern, Botanical Areas, Ecological Emphasis Areas, Outstanding Natural Areas, and Research Natural Areas), The Nature Conservancy Lands, and Wildlife Areas.
3. **Multi-resource Forest** (Forest with Restricted Timber Management) – includes lands where restrictions on timber harvesting have been implemented through Forest Plans, state laws, or agency policies. This includes portions of land within management allocations where scheduled timber harvest may occur, but where restrictions for wildlife habitat or other uses will significantly reduce timber outputs.
 - Federal: Adaptive Management Areas, Eastside Screens, Experimental Forests, Key Watersheds, Matrix Land (Federal), National Grassland, National Recreation Areas, and National Scenic Area.
 - Private/Other Public: Habitat Conservation Plans, Oregon Scenic Waterways, Riparian Management Areas (FPA), State Forests, and State Research Areas.
4. **Wood Production Forest** (Actively Managed for Timber Production) – includes lands where scheduled timber harvest may occur and where sustainable supplies of timber are anticipated. These forestlands are regulated through the Oregon Land Use Planning laws to maintain the land in forest uses by restricting development and through the Oregon Forest Practices Act to protect soil, air, water, and wildlife resources by regulating commercial forest operations.