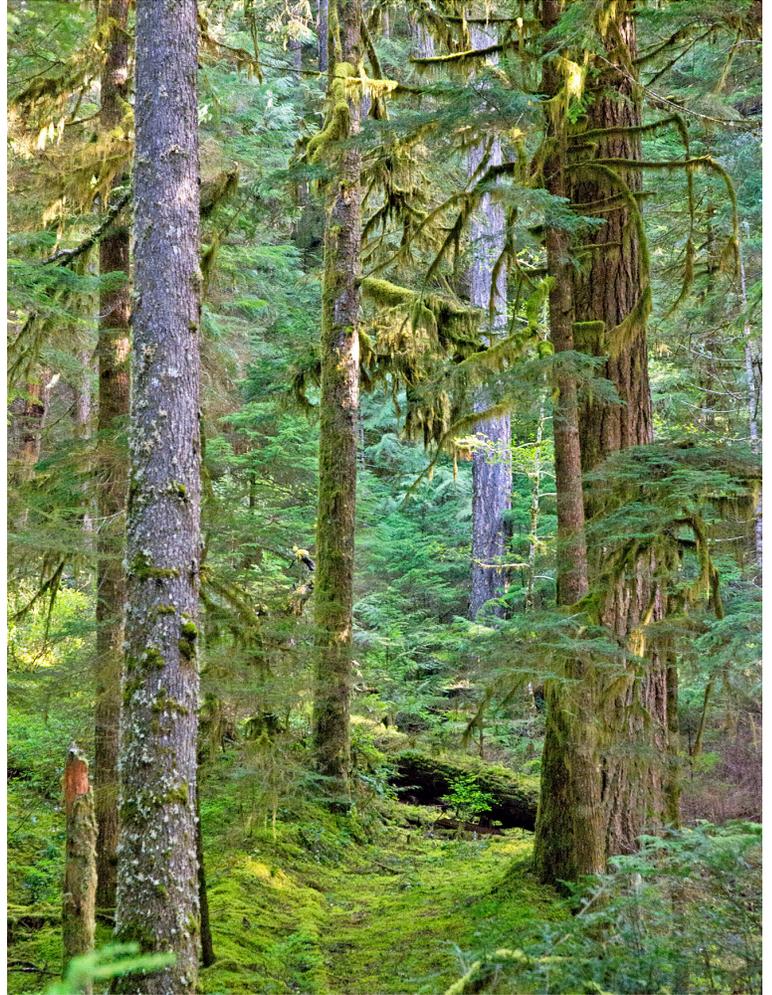


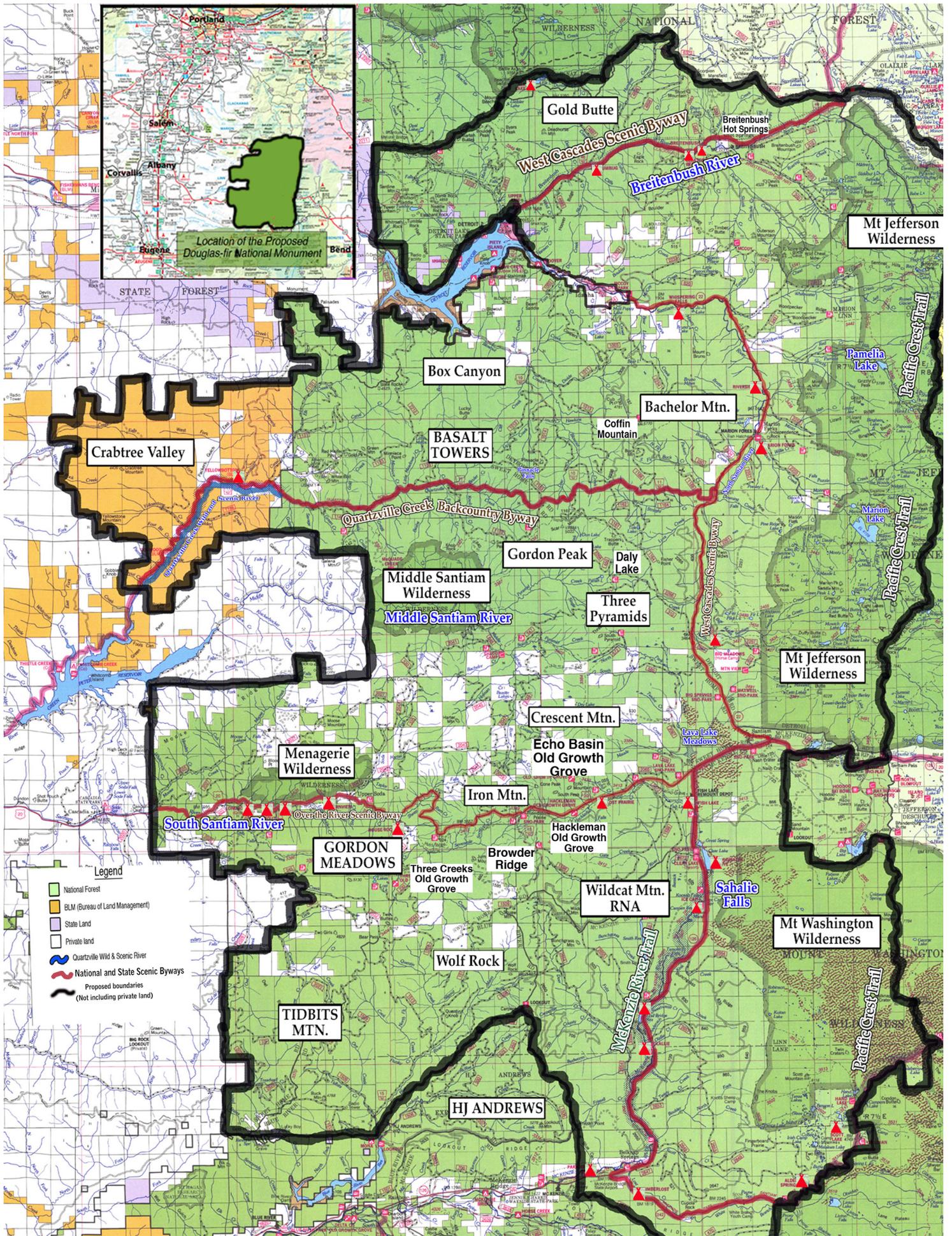
Proposed Douglas-Fir National Monument

Protect the Best, Restore the Rest



Friends of Douglas-Fir National Monument
www.douglasfirnationalmonument.org

Photo by Tanya Harvey



The Proposed Douglas-Fir National Monument



Photo by Chandra LeGue

At a few times in our nation's history, a species of tree was so magnificent that either the President proclaimed a national monument or Congress established a unit of the National Park System to honor and protect that tree in a significant portion of its range. The coast redwood in northwestern California and southwestern Oregon, the giant sequoia in the Sierra Nevada, the Joshua tree in the Mojave Desert, the tree-like saguaro and organ pipe cacti in the Sonoran Desert, the bald and pond cypresses in Florida, all have namesake national monuments or national parks. Each of these tree species is magnificent in its own ways, and so is the Douglas-fir. The creation of a Douglas-Fir National Monument would protect, honor, and conserve one of America's greatest natural treasures—the coast Douglas-fir forest ecosystem in Oregon's Western Cascades in the upper watersheds of the North Santiam, Middle Santiam, South Santiam, Calapooia and McKenzie Rivers. For the benefit of this and future generations.

Executive Summary

The proposed Douglas-Fir National Monument would conserve and restore a portion of federal public land in the Cascade Range of Oregon for the benefit of this and future generations. In addition to honoring the iconic Douglas-fir, the proposed national monument would also be managed to support biological diversity (including native fish and wildlife); air and quality; climate change mitigation and adaptation; wildlands and free-flowing streams; gorgeous views; quiet recreation, objects of historical and scientific interest; geological and botanical features; archeological, paleontological and cultural resources, dark skies; and natural forest succession—across the landscape and over time, from open meadows to young forests to old growth and back again through natural disturbance from fire, windstorms, and even volcanos!

In Brief

How It Can Be Established: By Act of Congress or presidential proclamation as authorized by the Antiquities Act.

Size: 700,000+ acres (1,094 square miles; or a square 33 miles on a side), all federal public land.

Administering Agency: Forest Service

Location: In Oregon's Cascade Range including the upper watersheds of the North Santiam River, Breitenbush river, Middle Santiam River, Crabtree Creek, South Santiam River, and McKenzie River on and near the Willamette National Forest in Marion, Linn, and Lane Counties.

The Landscape: Vast stands of mature and old-growth forests, young natural forests, lakes, wet meadows, dry meadows, free-flowing streams, high alpine meadows and peaks, talus slopes, and more.

Objects of Historic or Scientific Interest and/or Outstandingly Remarkable Values (aka "monumental values"): *biological diversity* (including native fish and wildlife); *air quality*; *climate change mitigation and adaptation*; *wildlands and free-flowing streams*; *gorgeous views*; *quiet recreation, objects of historical and scientific interest*; *geological and botanical features*; *archeological, paleontological and cultural resources, dark skies*; and *natural forest succession*—across the landscape and over time, from open meadows to young forests to old growth and back again through natural disturbance from fire, windstorms, and even volcanos!

Threats to Monumental Values: (1) Logging of native forest; (2) energy development; (3) mineral development; (4) unmanaged recreation.

What to Be Managed For: For the conservation and restoration of nature for the benefit of this and future generations.

Prohibited Uses: (1) Logging for purely commercial purposes (any logging is limited to scientifically sound ecological restoration thinning of monoculture plantations to put on a path to again become older complex forests, where any commercial logs are a byproduct. And (2) Mineral exploitation, subject to valid existing rights. (3) Off-road vehicle use (limited to designated routes).

Allowed Uses: Pleasure driving, hiking, biking, birding, nature study, hunting, fishing, horseback riding, camping, and other compatible uses.

How to Be Managed: Mostly passive management where nature—in all its glory and fury—is not just tolerated, but encouraged. There will be some active management such as (1) scientifically sound ecological restoration thinning to put monoculture tree plantations again on a path toward complex older forest—where commercial logs are a byproduct during a several-decade restoration period.

Economic and Social Benefits: Increased attractiveness of surrounding communities, leading to increased visitation and enhanced regional attractiveness for new or expanded investment. Improved and protected water quality. Protected carbon sequestration and a certain supply of timber from ecological thinning of monocultural plantations.

For More Information: The Friends of Douglas-Fir National Monument website:
www.douglasfirnationalmonument.org

Help Needed: Only if enough people come together and convince the Oregon Congressional Delegation and/or the President, will a Douglas-Fir National Monument come to be.

Table of Contents

Introduction.....	1
Background.....	1
Location and Extent of the Proposed Douglas-Fir National Monument.....	5
Ecoregions of the Proposed Douglas-Fir National Monument.....	7
Scientifically Sound Ecological Restoration Thinning of Douglas-fir Plantations Could Yield Several Decades of Commercially Valuable Logs...	7
What's Not in the Proposed Douglas-Fir National Monument.....	8
Ecological and Watershed Benefits of Douglas-Fir National Monument.....	8
1. Landscape Conservation and Restoration of a Douglas-fir Ecosystem	
2. More and Better Fish and Wildlife Habitat	
3. Watershed Conservation and Restoration for Nature and People	
4. Helping the Climate: Carbon Storage	
5. Opportunities for Educational and Scientific Study	
6. Outdoor Recreation	
7. Spiritual Renewal	
Economic and Social Benefits of a Douglas-Fir National Monument.....	12
1. Tourism and Recreation	
2. Local Businesses	
3. Water Resources	
4. Carbon Storage and Sequestration	
5. Timber	
Permanent Protection as a National Monument vs. Vulnerable Administrative Protection.....	13
Not Just a National Monument.....	13
How a Douglas-Fir National Monument Would be Administered.....	15
Planning for the Future.....	16
Resources.....	17
Appendices	
A. The Douglas-fir	
B. Major Tree Species in the Proposed Douglas-Fir National Monument	
C. EPA Level IV Ecoregions Within the Proposed Douglas-Fir National Monument	
D. Free-flowing Streams and Waters Within the Proposed Douglas-Fir National Monument that Qualify for Inclusion in the National Wild and Scenic Rivers System	
E. Lands Within the Proposed Douglas-Fir National Monument that Qualify for Inclusion in the National Wilderness Preservation System	

Introduction

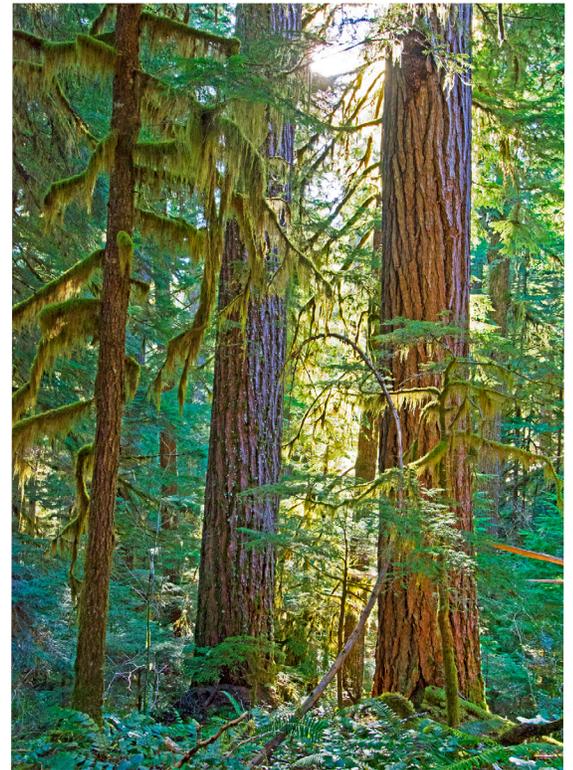
Throughout most of its range, Douglas-fir is found in stands mixed with other species. Coast Douglas-fir north of Oregon's Umpqua River is often naturally found in stands where Douglas-fir is the dominant overstory tree species. But after more than a century of intensive logging on both private and public lands, which has converted most original Douglas-fir forests to monoculture plantations, the Douglas-fir landscape is highly fragmented and relatively few parts remain undisturbed. The proposed national monument contains some of the finest remaining stands of ancient temperate conifer forest in the world, as well as substantial areas of older mature forest that, in time, will become old-growth forest. The previously logged stands (plantations) within the proposed national monument would be allowed to recover their full natural community of plants and animals—sometimes passively and sometimes utilizing scientifically sound ecological restoration thinning. The national monument can again become a significant natural, cultural and economic resource for the region and the world, and it will appropriately honor the State of Oregon's official tree.

In an era of climate change, preserving mature and old-growth forests—and allowing cutover forests to regrow into such forests—will make a major contribution to carbon sequestration and help to slow global warming.

In addition to old-growth Douglas-fir forests, there are old-growth stands of other tree species. The Douglas-fir ecosystem naturally includes a variety of tree species. (Please see Appendix B for a list of major tree species in the proposed national monument.)

Beyond conserving and restoring vast stands of coast Douglas-fir and other coniferous forests, the proposed national monument would also encompass and protect numerous objects of historic (e.g. archeological, paleontological, and cultural resources) or scientific (e.g. ecological, geological, and/or hydrological) interest, including wildflower-strewn meadows, small lakes and waterfalls that dot the landscape, and striking volcanic features.

Magnificent views will be preserved, and recreation compatible with the conservation of the values for which the national monument is established will be protected and encouraged. Pleasure driving, hiking, nature study, birding, hunting, fishing, biking, horseback riding, camping and related activities are some of the ways the national monument could be enjoyed and appreciated.



Background

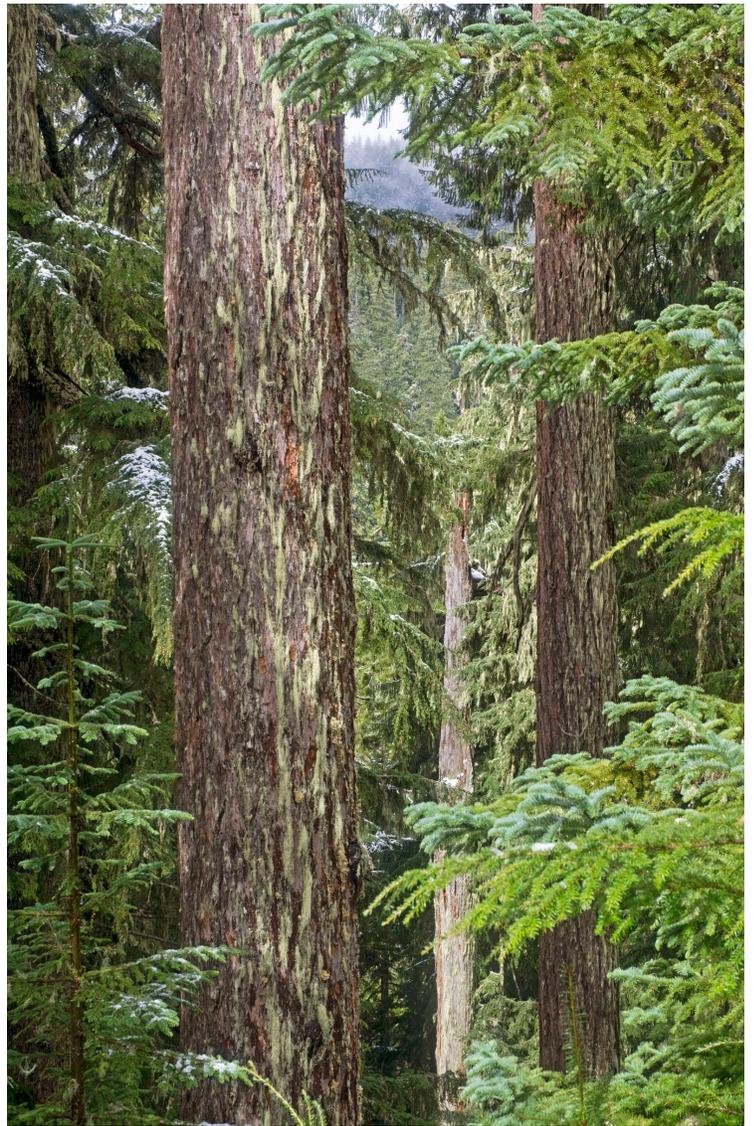
Until the twentieth century, most of Oregon west of the Cascade crest was covered by coniferous forest, comprising about 60% coast Douglas-fir, 17% hemlocks (*Tsuga* spp.; western and mountain hemlock), 15% true firs (*Abies* spp.; white fir, noble fir, subalpine fir, Pacific silver fir, grand fir and California red fir) and a small percentages of other trees. Douglas-fir was the foundation species of this magnificent forested landscape, which extended from 19°N in the mountains of central Mexico, nearly 2,800 miles to 55°N in central British Columbia. There are two recognized varieties: coast Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) and Rocky Mountain Douglas-fir (*P. menziesii* var. *glauca*). (Please see Appendix A for a brief natural history of the Douglas-fir.)

Most natural Douglas-fir forests have been clearcut and replaced with monoculture plantations of Douglas-fir trees—all evenly spaced and of the same height. Such plantations are more akin to a cornfield than a forest. Today, pristine stands of mature and old-growth Douglas-fir are but a small fraction of their former extent.

Coast Douglas-firs can rival redwood trees in size and age. The Scottish pioneer botanist David Douglas, for whom the tree is named, noted trees in the lower valleys of western Washington that averaged 17-feet thick. They can reach heights of several hundred feet, but the tallest were logged first, and no one knows for sure how tall these were. The trunk of the Nooksak Giant, cut in 1897, was said to be 465 feet long. Douglas-firs can reach ages of a thousand years or more. In California there are both national and state parks that pay homage to the redwoods, yet nothing comparable exists for the Douglas-fir, even though it is a more important species in its range and significance, and old growth forests of Douglas-fir are as magnificent as those of coast redwoods—often with greater ecological diversity.

The proposed national monument will protect a significant relic of the globally unique Pacific Northwest temperate rainforest for this and future generations to enjoy.

Conservation biologists tell us that in order to prevent catastrophic extinctions we must preserve approximately half of the earth in an essentially natural condition. Yet the once-great conifer forests of Oregon have been mostly logged and replanted in even-aged stands that lack most of the ecological characteristics of a natural forest. The establishment of the Douglas-Fir National Monument won't completely solve this problem, but it would be a good start.



We are now at a historical crossroads in our relationship to the natural world that supports and nourishes us. Ecosystems of every sort are increasingly disrupted by fragmentation and resource extraction. Species of plants and animals are under unprecedented pressure as habitat shrinks to isolated islands in a sea of human activity

The conservation and restoration of the magnificent Douglas-fir forest will disproportionately help ameliorate global warming. Because of their massive amounts of biomass, unlogged Douglas-fir forests store huge amounts of carbon that, if logged, would be released into the atmosphere and contribute to climate change. Even though young forests are fast-growing, they do not approach the carbon storage of old-growth for at least 200 years.

The conversion of diverse Douglas-fir ancient forests to monocultural plantations is almost complete on private and state timberlands. Clearcutting was followed by replanting with just Douglas-fir seedlings, herbicide spraying to kill competing plants and clearcutting again in 35-50 years. The resulting “forest” is impoverished for fish and wildlife, destructive to soils and streams, and devoid of scenic value—and in the long run it is not sustainable.



A clearcut on private land north of the Menagerie Wilderness. In the proposed monument, such blocks of land will remain under private ownership and management, unless they are acquired by the Forest Service from willing sellers.

Federal public lands are mostly at higher elevations than private holdings, and they contain a mixture of stands of different ages from recent clearcuts to very old forest in a patchwork across the landscape. The taller forest in the background is a still-standing older forest on federal public lands. The middle ground is a Douglas-fir plantation.



The national forest lands in the proposed national monument are currently managed by the U.S. Forest Service under the 1995 Northwest Forest Plan (NWFP). While the NWFP is the best large landscape conservation plan ever implemented by any government in the world, it is not ecologically sufficient to conserve and restore ancient coastal Douglas-fir forests and it is currently being amended. More must be done, such as the establishment of the permanent protection of a national monument.

Nearly all remaining old-growth Douglas-fir forests are on federal public forestlands, mostly administered by the Forest Service. But the proposed monument also includes significant amounts of lands administered by the Bureau of Land Management, including Crabtree Valley, home of some of the largest and oldest Douglas-fir trees left in Oregon. Because no more than 15% of old-growth public forestlands remain, the Douglas-Fir National Monument is proposed to preserve some of the best remaining old-growth and allow eventual restoration of significant stands of future old-growth forests. Almost all federal forestlands have been significantly fragmented by past logging.



Log trucks still haul logs out of the forest, including in the area of the proposed monument.

Federal public forestlands also have many stands that were logged long ago and now are beginning to approach maturity. True “ancient” forests—with trees at least 200 hundred of years of age and of great structural complexity—are scarce almost everywhere, and the best stands are generally only accessible by driving many miles on logging roads and then hiking. However, mature and old-growth forests in the proposed national monument are the rule, not the exception.

Scientists have found that the root system of one Douglas-fir tree will graft to the roots of adjoining trees, and collectively they share hormones and starches. This is one of many ways that a forest is much more than a mere collection of individual trees.

The needle surface area of two average old-growth Douglas-fir trees is equal to the playing area of an American football field, making each tree an amazing collector of moisture and carbon dioxide from the atmosphere. An old-growth Douglas-fir continues to increase its carbon storage all its life. When it dies, the stored carbon is mostly transferred and stored in the forest’s soil.

If all remaining blocks of coast Douglas-fir are preserved, if the natural young and mature stands are allowed to continue to grow older, and if the young plantations are managed for ecological diversity instead of commercial log production, then the Western and High Cascades within the proposed national monument has a chance to recover much of the wild quality it had before the era of massive clearcutting. The proposed Douglas-Fir National Monument would preserve the best of what is left and would restore the rest.

The proposed Douglas-Fir National Monument would provide a scientific laboratory to study how an extensive mature and maturing ecosystem will adapt to climate change; how it will provide a haven for species found only in old-growth forests; how it can adapt to the increased risk of wildfires, and how it can provide Americans an opportunity to visit a world not seen for more than a hundred years.

Location and Extent of the Proposed Douglas-Fir National Monument

The proposed monument would consist of federal public land within and near the Willamette National Forest. The northern boundary would abut the Opal Creek Scenic Recreation Area, Opal Creek Wilderness and Bull of the Woods Wilderness. The southern boundary takes in the Calapooia River, upper Blue River and upper McKenzie



Quartzville Creek

River watersheds, the old McKenzie Highway and the southern edge of the Mt. Washington Wilderness. The eastern boundary would be the Cascade Crest, except where the boundary excludes the Santiam off-road vehicle area between the Mount Jefferson and Mount Washington wilderness areas. The western boundary would generally follow the existing boundary of Willamette National Forest but would include the contiguous area of BLM holdings centered on the Quartzville Creek Wild and Scenic River and Crabtree Valley, home to the oldest known Douglas-firs in Oregon. It would also include a 191-acre BLM parcel along the Middle Santiam River above Green Peter Reservoir, an exceptional remnant of magnificent, low-elevation, old-growth Douglas-fir forest.

Included in the proposed national monument would be all of the Middle Santiam and Menagerie Wilderness areas, the western portion of the Mount Jefferson and Mt. Washington Wildernesses, and the Quartzville Creek and Upper McKenzie Wild and Scenic Rivers. When the Middle Santiam Wilderness was established in 1984, it was to set aside an example of old-growth Douglas-fir forest. But the example was just a sample and the de facto Middle Santiam wildland is over twice the size of the Middle Santiam Wilderness. To achieve the necessary task of preserving a meaningful and useful component

of the Douglas-fir ecosystem of the Pacific Northwest, a much larger area of wilderness, roadless areas and already impacted areas that—with proper management—can gradually return to a natural state is necessary.

The proposed national monument would also include important roadless areas, including: the margins of Opal Creek, Middle Santiam, and Mount Jefferson Wildernesses, Hoover Ridge, Bachelor Mountain, McQuade Creek, Three Pyramids, Moose Creek, Gordon Meadows, Jumpoff Joe, and Iron Mountain. (Please see Appendix B for more details.)

At over 700,000 acres the proposed Douglas-Fir National Monument would be on scale with many other major national monuments around the country. For instance, Cypress National Preserve in Florida protects 720,566 acres and Joshua Tree National Park in California protects 790,636 acres.

A national monument to preserve and honor the Douglas-fir needs to include a lot of Douglas-fir forest of all ages and conditions across a large landscape. The goal of creating a new national monument to the Douglas-fir forest is not merely to preserve the scattered fragments of older forest that remain today, but to restore ecological and hydrological integrity to a region that has undergone profound alteration since large-scale industrial logging began after World War II. While some excellent groves of ancient Douglas-fir forest are permanently protected in places like the Middle Santiam and Mount Jefferson Wildernesses, much but certainly not all, of the older Douglas-fir forest stands in the area only have some level of administrative protection, which is vulnerable to change as political administrations change.

There are many magnificent stands of old-growth Douglas-fir forest scattered across the proposed national monument. Some of the oldest stands are in Crabtree Valley and the Gordon Meadows roadless area (Millennium Grove) and in areas that could be included in an expanded Middle Santiam Wilderness.



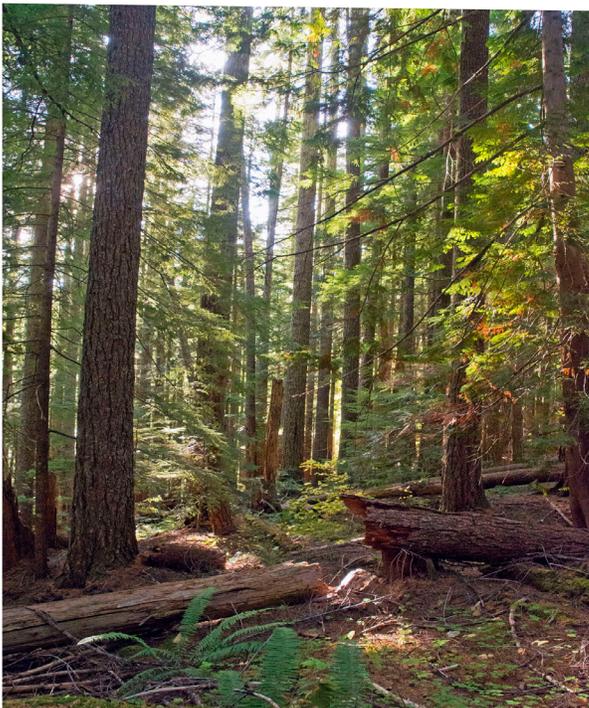
The southern and northern limits of the proposed monument span over 40 miles. The eastern and western limits are separated by 20–25 miles, and elevation change of nearly 10,000 feet (from the peak of Mount Jefferson to the South Santiam River).

Crabtree Lake after a late spring snowfall.



Gordon Meadows

photo by Tanya Harvey



Besides many “cathedral groves” of ancient forest—where one can walk among majestic, ancient trees that are incomparably awe-inspiring—much of the remaining old-growth forest consists of “younger” (though often well over a century or two in age) stands with old-growth trees scattered within them. This pattern reflects the history of large natural cataclysmic events—predominantly fires, but also wind storms and unstable soils, which left a naturally patchy mosaic on the landscape.

In areas such as the Millennium Grove near Gordon Meadows, for example, there are large-diameter trees over 800 years old. These remnants of an ancient fire stand tall among smaller trees that survived a different fire about 200 years ago (still old growth in anybody’s book). Older forests, with a mixture of trees of different ages, abundant snags and downed logs are the most favorable for wildlife and provide the best conditions for healthy watersheds.

Millennium Grove



Photo by David Treedt

In addition to conserving and restoring vast stands of coast Douglas-fir and other coniferous forests, the proposed national monument would also encompass and protect numerous objects of historic (e.g. archeological, paleontological, and cultural resources) or scientific (e.g. ecological, geological, and/or hydrological) interest, including wildflower-strewn meadows, small lakes and waterfalls that dot the landscape, and striking volcanic features.

*Panorama Point,
in the Menagerie Wilderness*

Ecoregions of the Proposed Douglas-Fir National Monument

The proposed national monument is entirely within the Cascades “Level III” Ecoregion, as defined by the Environmental Protection Agency. The mountains of the Cascades are widely underlain by Cenozoic volcanic rocks and have been affected by alpine glaciation. Maximum elevations of up to 11,239 feet occur on active and dormant volcanic peaks in the eastern part of the ecoregion (the High Cascades). The western portion of this ecoregion is called the Western Cascades, which are older, lower and dissected by numerous, steep-sided stream valleys. The Cascades have a moist, temperate climate that supports an extensive and highly productive coniferous forest that has been intensively managed for logging. Subalpine meadows occur at high elevations.

Further refining the ecoregion, EPA scientists divide Oregon’s Cascade Range Level III Ecoregion into six additional Level IV ecoregions, four of which are found in the proposed national monument:

- Western Cascades and Lowland Valleys
- Western Cascades Montane Highlands
- Cascade Crest Montane Forest
- Cascade Subalpine/Alpine.

(A more detailed description of the four Level IV ecoregions may be found in Appendix C.)

Scientifically Sound Ecological Restoration Thinning of Douglas-Fir Plantations Could Yield Several Decades of Commercially Valuable Logs

Clearcut logging of old-growth forests on federal public lands took off after the end of World War II and mostly came to an abrupt end the early 1990s, culminating in the Northwest Forest Plan (NWFP) of 1995. Since the NWFP, logging operations transitioned to trees established in plantations after clearcutting of old-growth forests.

The establishment of a Douglas-Fir National Monument will not lead to the immediate end of all logging on public lands in the area. Rather, for at least another 20 to 30 years, the careful ecologically-sound restoration thinning of many of the monoculture plantation stands will continue. That will allow the stands to evolve again into mature and then old-growth forests, while providing timber supply to local mills.



There are vast stands of “successful” Douglas-fir plantations in the proposed national monument. The trees in these stands are generally of all the same age, same spacing and same species. They are closer to biological deserts than real forests. Judicious ecological restoration thinning of such stands can accelerate the onset of late successional (older forest) characteristics, putting these stands on a fast track to again become old-growth forests. Thinning a stand can allow the remaining Douglas-fir trees to get bigger faster (bigness is a characteristic of an ecologically complex old forest). Where bigleaf maple, alder

species, and other native conifer species have nonetheless established themselves in the plantation, thinning can favor the growth of these stalwart survivors, increasing the diversity of the stands. In addition, small openings can be created to the benefit of deer and elk.

What’s Not in the Proposed Douglas-Fir National Monument

Within the proposed national monument boundary are some blocks of private timberland—legacies of 19th Century railroad land grants. National monument designation would not affect their private land ownership or management. If any private or other non-federal lands are to come into federal ownership due to sale or gift by willing sellers, such lands will become part of the national monument. The communities of Detroit and Idanha (as well as Detroit Reservoir) are outside the proposed monument boundary. Within its exterior boundary are 1,270 acres that are part of Santiam State Forest and about 50,000 acres of privately owned land, excluded as well.

Ecological and Watershed Benefits of a Douglas-Fir National Monument

1. Landscape Conservation and Restoration of the Douglas-fir Ecosystem

The proposed national monument will provide a tremendous opportunity to conserve and restore ecosystem integrity and a full complement of biological diversity to a significant part of the range of the Douglas-fir. The western



Cascades are home to 322 regularly occurring species of vertebrates, including 187 birds, 74 mammals, 18 amphibians and 12 reptiles. There are also over 7,000 species of arthropods—insects and spiders—(comparable to numbers found in tropical forests)), and thousands of different species of plants, fungi and lichens. These species do not live in isolation, but in complex networks of interaction. Most of their interrelationships are still unknown to science and are important to maintaining the ecosystem.

Northern spotted owl

Especially important to the health of the forest, but largely invisible, are over 2,000 species of mycorrhizal fungi that nourish the roots of large trees and provide food for small mammals such as the northern flying squirrel, one of the main prey species of the northern spotted owl. These fungi are largely destroyed by the kind of forestry that has prevailed for the last century, but will recover in time—if left alone. Larger ecosystems have more resilience than small ones and can recover better from natural disruptions such as wildfires. A national monument will provide a significant buffer against disturbance, a local environmental insurance policy in a time of global climate change.

Northern flying squirrel



Hygrophorus punicea

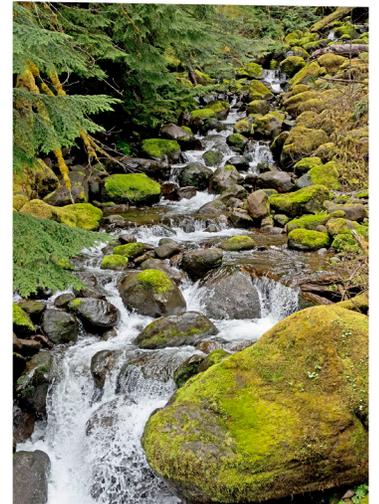
2. More and Better Fish and Wildlife Habitat

Conditions for wildlife will improve enormously after the establishment of the national monument. Many animal species need older forest to thrive; not only northern spotted owls but also pileated woodpeckers, northern goshawks, many amphibians, and mammals such as the wolverine, fisher and marten. An exciting mid-term possibility is that wolves may return to this area and—in the longer term—grizzly bears. Recent research has demonstrated that ecosystems lacking their traditional top predators are out of balance, leading to overpopulations of ungulates such as deer and elk, and impoverished vegetation. Animals that prefer more open forest stages will benefit from the restoration of natural young forests, a landscape consisting of diverse habitats rather than tree farms.



Grey wolf

Of particular importance will be the protection and enhancement of streams for native fish such as bull trout, steelhead, and chinook salmon. By protecting streams and entire watersheds from the effects of logging—and from the erosion caused by roads—habitat for fish will be enhanced. Restoration of salmon habitat has been underway for some time in Moose Creek, a stream within the proposed Monument, and the restoration of healthy riparian habitats will be one of the major goals of the area's management.



The proposed national monument will also improve connectivity between areas of prime wildlife habitat, reducing the fragmentation that can trap animals in shrinking islands of their preferred range. Many animals need to travel over large areas to feed or find mates, or, like the spotted owl, they may use one type of habitat for nesting and another for foraging. It is crucial that the national monument be large enough to allow for the free and necessary movement of the larger mammals.

The ecosystem would benefit from rewilding, that is, the restoration of all of its natural components including large predators. The proposed national monument has the potential to become a key component of what has been called the Pacific Wildway, a mega-linkage for wildlife that could potentially extend from Baja California to Alaska.

Another benefit of the proposed national monument is as a refuge for wildlife in a time of global warming. Climate change is already causing stress to many animal populations. Older forest with its greater shade, abundant moisture, complexity of vegetation and variety of structural and functional features offers the best chance for long term survival of countless species. North-facing slopes of mature forest often provide the most protective habitat for animals in need of shelter from a warming climate.

Here is just one area within the proposed national monument that has extraordinary wildlife values: The Quartzville Creek basin provides one-quarter to one-third of all of breeding habitat for the harlequin duck in Oregon. There are also several interesting waterfalls on the creek.

3. Watershed Conservation and Restoration for Nature and People

Ancient forests provide the best water quality and quantity on the planet. All of the towns and cities downstream from the proposed national monument will see an enhancement of their water quality, including the communities of Salem, Eugene, Lebanon, Mill City, Stayton and Sweet Home. Costs for filtration will drop as the quantity of sediment in the water decreases, and this enhanced water quality will be provided at no cost to the ratepayer.

4. Helping the Climate: Carbon Storage

Mature and old-growth forests provide one of the most effective mechanisms of carbon storage in existence. Forests contribute to the atmospheric stability in two ways: they actively remove carbon dioxide through photosynthesis that puts carbon into vegetation and soils, and they simultaneously release oxygen. Forests also store enormous amounts of carbon in their biomass—both above and below ground.



Scientific studies have shown that conversion of old-growth forests to plantation monocultures does not decrease atmospheric carbon as the timber industry would have you believe. Even when the long-term sequestration of carbon in wooden buildings is taken in to account, logging forests result in more carbon in the atmosphere than not logging forests. Older forests store more carbon, and younger forests do not approach old-growth storage capacity for at least 200 years.

An older forest in the McQuade Creek watershed

5. Opportunities for Educational and Scientific Study

The proposed national monument can be a site for advanced scientific study, since science still has much to discover about the dynamics of natural forests and about many of the organisms that live there. In addition to the importance of mycorrhizal fungi, examples of scientific findings from the last few decades of research include:



- The amazing diversity of life in the canopy of old forests, with trees of many other species sprouting from moss-covered limbs high in the air;

Researchers in an old-growth Douglas-fir tree over 200 feet tall, in the H. J. Andrews Experimental Forest, near the proposed monument

- The isolation of paclitaxel (now synthesized), the active ingredient in the cancer-fighting drug Taxol®, from the bark of the Pacific yew (*Taxus brevifolia*), once considered a weed tree;

- Research that suggests millipedes play key roles in the maintenance of forest soils, showing that some of the most seemingly humble organisms can turn out to be the most important; and



Millipedes in an Oregon forest



- The discovery that the lichen *Lobaria oregana*, called lung lichen, or Oregon lettuce, is a primary source of fixed atmospheric nitrogen in old forests. It is an organism that supplies free fertilizer to the ecosystem, but it cannot grow in tree plantations with short rotation cycles.

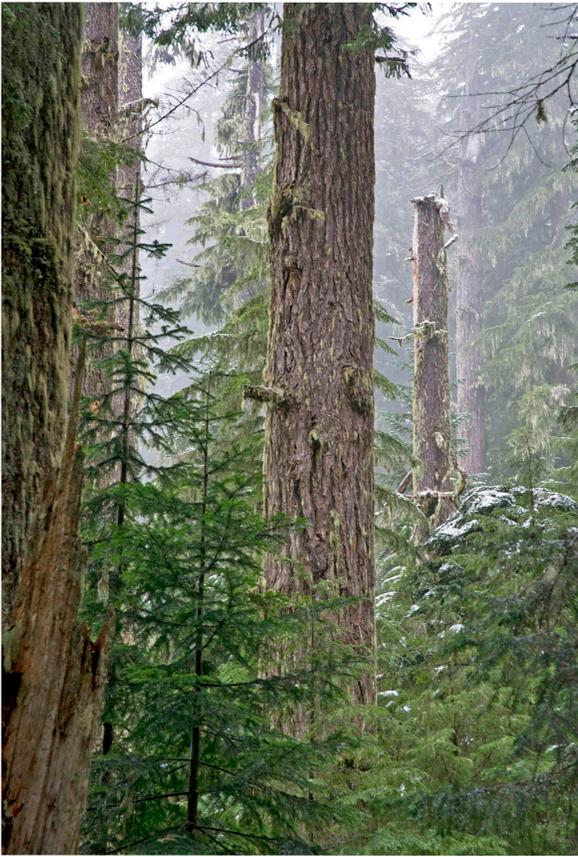
Lobaria oregana on a tree limb in the H. J. Andrews Experimental Forest

6. Outdoor Recreation

Establishment of the national monument will provide increased recreational opportunities, first and foremost by creating an icon of the Douglas-fir forest, giving it official recognition as a place of value, a unique treasure of the Pacific Northwest. As the younger portions of the area again grow into mature forest—and the now-mature forest approaches the conditions of old growth—the attractiveness of the Monument will steadily increase, drawing more and more visitors to the region.



The area in the proposed monument has 38 campgrounds and ~55 trailheads serving about 500 miles of trails. As heavy visitor use of Opal Creek Scenic Recreation Area demonstrates, large numbers of people, from families with young children to the elderly, want to explore trails in old forests, especially trails that follow streams, or ridgelines with commanding views. Cross-country skiers enjoy the Maxwell Butte area and road bikers use the area, especially the paved 40-mile Quartzville Backcountry Byway. The national monument will serve the recreational needs of Oregonians and attract visitors from elsewhere in the nation and from around the globe.



7. Spiritual Renewal

The forest can also be a locus for educational and spiritual activities, with much to teach old and young alike. People will learn about plants, animals, stream life and ecosystems by visiting the monument, and it will inspire contemplation of our place in nature for people of all ages and beliefs. It will be a setting in which we can gain a proper sense of context, a sense of humility, and the knowledge that we are but one part of a much larger and vastly complex world. It will be a place to experience actual, rather than virtual, reality.



Economic and Social Benefits of a Douglas-Fir National Monument

1. Tourism and Recreation

The creation of the Douglas-Fir National Monument will attract visitors to the area from everywhere on the globe, from Asian and European tourists to hikers from the Willamette Valley, around the state and Northwest; it will have a significant positive impact on the economic health of the region.

2. Local Businesses

Outdoor recreation industry jobs in Oregon are on the increase. In addition, Oregon employers have a competitive advantage over other parts of the country in that they offer jobs to workers that allow them to enjoy the great Oregon outdoors during their time off.

As discussed in the website's more focused discussion on economics, studies have found that communities near important protected natural resource sites, such as national parks or national monuments, experience an increase in the diversity of locally based business. Part of this is an increase in recreational based businesses, but another important source of growth is the tendency of new businesses that can locate anywhere often choose to locate in such areas because of their proximity to a national monument or national park.

3. Water Resources

Over time, local communities downstream will see a decrease in their costs for filtration and water treatment due to the enhancement of water quality that will result from the Monument's establishment.

4. Carbon Storage and Sequestration

Climate change is costly to society in ways that influence every aspect of life, such as rising sea levels, more severe storms, disruption to agriculture, impacts on water supplies, increased cooling costs and the spread of invasive species and pathogens. By conserving older forests and allowing the continued growth of younger ones, the Monument

will help mitigate these costs. Additionally, as carbon pollution is properly priced in the market, the stored carbon in proposed Douglas-Fir National Monument can be economically recognized.

5. Timber

Under the Northwest Forest Plan as implemented, logging on the federal lands within the proposed national monument has generally been limited to ecological restoration thinning of previously logged stands. This would generally continue in the proposed national monument for two to three decades.

Since 1995, the number of wood products mills and jobs in Oregon have halved, while the milling capacity of the remaining mills has increased by one-quarter. The timber industry's appetite for logs increases while it provides fewer jobs. Most logs in the state come from non-federal lands. More logs from private lands are exported to Shanghai, Tokyo and other locations than come from federal public lands in Oregon and Washington.

Jobs in Oregon's wood products industry will continue to decline as mill automation continues to increase. Our remaining older forests are more valuable for the watershed, recreation and ecosystem goods and services they provide, rather than as mere sawlogs.

Permanent Protection as a National Monument vs. Vulnerable Administrative Protection

Portions of the proposed national monument are already designated by Congress as Wilderness (Mount Jefferson, Mt. Washington, Middle Santiam and Menagerie areas) or as a Wild and Scenic River (Quartzville Creek and McKenzie River), both designations that can provide enduring conservation for the benefit of this and future generations.

Most of the proposed national monument is managed under the Northwest Forest Plan (NWFP) of 1995, which established conservation areas called Late Successional (older forest) Reserves and Riparian (streamside) Reserves. It also established "Matrix" land for logging. There is a lot of Matrix in the proposed monument that contains mature and old-growth forest and that is generally open to logging. The NWFP is subject to being weakened by a future administration. The NWFP is currently undergoing amendment, where it is all but certain that the Forest Service will weaken conservation protections and increase logging. Including these lands in the national monument will add a degree of protection that would be shielded from evolving policies within the federal land management agencies.

Not Just a National Monument

1. Wild and Scenic Rivers

Within the proposed Douglas-Fir National Monument are numerous rivers, creeks, and small lakes that qualify for inclusion in the National Wild and Scenic Rivers System. Wild and Scenic River status confers not only additional recognition as to the outstandingly remarkable values of these water bodies, but also additional protection against dams and other water diversions. Presently, the only Wild and Scenic River in the proposed monument are lower Quartzville Creek and upper McKenzie River. Potential Wild and Scenic Rivers include:



- the rest of Quartzville Creek with several tributaries;
- Breitenbush River and its forks
- the North Santiam and several tributaries
- The Middle Santiam and several of tributaries;
- The South Santiam (several of its tributaries); and
- Crabtree Creek (including Crabtree Lake).

These candidates are all on the introduced River Democracy Act, which has not yet been enacted into law. Protection in a national monument would preserve the beauty of these rivers while Congress considers its options. (Please see Appendix D for more detail.)

2. Wilderness

Within the proposed national monument are numerous roadless areas that qualify for inclusion in the National Wilderness Preservation System. Currently, the only designated Wildernesses in that area are the Middle Santiam, Menagerie, and the portions of the Mount Jefferson and Mount Washington wildernesses west of the Cascade Crest.



Potential new wilderness areas include, but are not limited to, Gordon Meadows, Bachelor Mountain, Moose Creek, Mount Bruno, Jumpoff Joe, Hoover Ridge, Menagerie Additions, Hall Ridge, Iron Mountain, Scorpion Mountain, Three Pyramids, Box Canyon, and Crabtree Valley Roadless Areas, as well as potential roadless additions to the Middle Santiam, Menagerie, Mount Jefferson, and Mount Washington wildernesses. (Please see Appendix E for more detail.)

Mt. Jefferson in winter

3. Byways

Parts of two national scenic byways and an Oregon scenic byway traverse the proposed national monument. A byway designation only confers recognition of scenic and recreation resources along the route. A national monument designation will confer protection of such resources. Included with the proposed DFNM are:

- Quartzville Road BLM Back Country Byway (USFS 11);
- Over the River and Through the Woods Oregon Scenic Byway (US 20);
- West Cascades National Scenic Byway (OR 22 and Breitenbush River Road), and
- McKenzie Pass – Santiam Pass National Scenic Byway.

4. Birdways

Most of the Mount Jefferson and Three Sisters Loops of the Oregon Cascades Birding Trail are within the proposed national monument. While not directly affording any conservation protection of bird habitat, the birding trail confers important recognition of avian habitats within the area.

5. Conservation Opportunity Areas

The Oregon Department of Fish and Wildlife have identified Conservation Opportunity Areas (COAs). These COAs are partially or wholly within the proposed Douglas-Fir National Monument:

- Central Cascades Crest, West Conservation Opportunity Area;
- McKenzie River Area Conservation Opportunity Area;
- Quartzville Creek Area Conservation Opportunity Area; and
- Breitenbush River Conservation Opportunity Area.

6. Native Fish

- Resident cutthroat trout are common to most every stream in the proposed national monument.
- Resplendent rainbow trout are found in a few streams within the proposed national monument.
- Pacific lamprey are struggling to hold on in the South Santiam and Calipooia basins.
- Spring chinook salmon are resident in the Breitenbush, North Santiam, McKenzie, Calapooia, and South Santiam watersheds, despite several downstream dams operated by the US Army Corps of Engineers.
- Bull trout, a species listed under the Endangered Species Act, were historically found in the North Santiam and South Santiam River basins and could be again.
- Summer steelhead are found in the upper McKenzie mainstem.

How a Douglas-Fir National Monument Would be Administered

1. Administration

The proposed Douglas-Fir National Monument would be administered by US Forest Service. (The federal public forestlands currently administered by the Bureau of Land Management would be incorporated into the Willamette National Forest. The mandate and clear goal of monument designation will be the conservation and protection of the natural environment. Only uses that are compatible with that goal will be allowed in the national monument. As proposed herein, the Douglas-Fir National Monument can be established by an Act of Congress or by a proclamation by the President under authority granted by Congress in the Antiquities Act of 1906.

2. Forestry

Forestry within the national monument would be limited to previously logged lands in ways that aid the reestablishment of natural ecosystem and watershed dynamics, such as variable density thinning to accelerate the re-creation of older forest character. Any logs produced by logging within the national monument will be a byproduct of ecological restoration. No salvage logging after fire, windstorm, disease occurrence or insect event will be allowed, as these disturbances are natural and beneficial. As one key study says:

...post-fire (salvage) logging does not contribute to ecological recovery; rather, it negatively affects recovery processes, with the intensity of impacts depending upon the nature of the logging activity. Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts. Trees that survive fire for even a short time are critical as seed sources and as habitat that sustains biodiversity both above- and below ground. Dead wood, including large snags and logs, rivals live trees in ecological importance. Removal of structural legacies, both living and dead, is inconsistent with scientific understanding of natural disturbance regimes and short- and long-term regeneration processes. (Noss, et al. Ecological Society of America, 2006)

A post-disturbance forest—also called a “snag forest” or complex early seral forest—is one of the rarest and most biologically diverse forest ecosystem stages. A “snag forest,” is full of wildlife, including species that require or prefer those kinds of forest conditions, such as the black-backed woodpecker, whose coloring allows it to enjoy food from the blackened trees with reduced risk of being eaten itself.

3. Roads

Existing US and state highways will not be affected by national monument designation other than to improve the scenic views as logged-over forests recover in time. An extensive road system, necessary for the public enjoyment and administration of the national monument, will be maintained. Unnecessary roads will be decommissioned by encouraging (through recontouring of the slope, etc.) or allowing (passive restoration) them to revert to nature. Some might become hiking, horseback riding and mountain biking trails. Necessary roads will be maintained and improved to make public travel safer and to make such roads more wildlife- and watershed-friendly. No new roads will be built.

4. Fires

Natural wild fire is either the rebirth or the continuation of a forest. As a general rule, fires will be left to burn naturally until they run out of fuel or the rains come. The protection of buildings will be accomplished primarily through vegetation management directly adjacent to those buildings and ensuring the buildings themselves are resistant to fire.

5. Biological Diversity and Wildlife

A key component of management in the national monument will be to restore as much as possible the full complement of native species diversity and wildlife that was historically present in the Western Oregon Cascades. Habitats favored by species that are rare, threatened or endangered, such as the northern spotted owl and the fisher, will be given highest priority for protection, and access to these habitats will be restricted as needed to preserve and in-

crease populations at risk. Re-establishment of beavers (the Oregon state mammal) in their historic range, and the return of wolves and grizzly bears will be allowed. The managing agency will endeavor to maintain national monument lands in a condition that enhances their use as wildlife corridors.

6. Mining

Subject to valid existing rights, the federal public lands within the proposed national monument will be withdrawn from all forms of mineral exploitation. Any valid existing right to mine could proceed unless they were acquired by the federal government.

7. Recreation

Recreation that is compatible with the conservation goals of the national monument, such as hiking, birding, botanizing, photography, camping and pleasure driving will be encouraged. Hunting and fishing will remain under the jurisdiction of the State of Oregon. Off-highway motorized recreation use will be limited to existing designated routes, and in ways that do not harm the values for which the national monument was established.

8. Existing Homes and Businesses

The cities of Detroit and Idanha (as well as Detroit Reservoir) are not included in the proposed national monument boundary. The status of privately owned inholdings on federal land will remain unchanged, and traditional access will be preserved.

9. Native American Interests

The establishment of the national monument will not increase, decrease, or change any Native American rights. Native Americans made use of the area of the monument when it was in a condition approximating that to which it would be restored after the creation of the monument. Native American tribes with interests in the proposed national monument area will be especially consulted as to the development and implementation of the management plan.

Planning for the Future

Douglas-Fir National Monument will provide an improved protective environment for many of the endangered and threatened species native to the Pacific Northwest. The proposed national monument will provide a scientific laboratory for studies of the renewal of an extensive area of old-growth forests and how these areas respond to climate change.

Douglas-Fir National Monument will provide a large net benefit to the economy of Oregon through an increase in recreation-related activities, improved water quality and the sequestration of carbon. Any loss in jobs due to a reduction in log supply from the federal public forestlands that will be part of the proposed Douglas-Fir National Monument will be more than offset by the creation of other jobs. The Monument will also provide great ecological social and cultural benefits by honoring and preserving one of the greatest ecosystems on earth, attracting visitors from around the globe and restoring a complex community of life that is unique to the Western Cascades.

The local economies in the North Santiam Canyon and the South Santiam Valley are in transition. The days of huge logging levels attained by the clearcutting of old-growth forests are long gone. Almost all state and private lands have been converted to plantations, and society has decided that what old-growth forest is left on the public lands has higher and better uses than an unsustainable wood supply.

For better or worse, the Willamette Valley will continue to increase in population and urbanization. The establishment of Douglas-Fir National Monument can help the economic transition and diversification of local communities. There is still money to be made and jobs to be had by logging on public lands. Increasingly, there will also be

money to be made and jobs to be had from a sustainable tourism and recreation-based economy. People who come to see and enjoy the vast forests of Douglas-fir will need lodging, food, drink, supplies and guides. The trees of the national forest will still be producing economic value to local communities, but they won't have to give their lives to do so.

By including currently degraded forests in a national monument dedicated to long-term conservation, our grandchildren will be able to see the vast landscape of old-growth forests that our grandparents saw.

Resources

Jim Furnish, *Toward a Natural Forest; The Forest Service in Transition*. Oregon State University Press, 2015, 224 pp.

Mark E. Harmon, William K. Ferrill and Jerry F. Franklin, "Effects on Carbon Storage of Conversion of Old-Growth Forests to Young Forests", *Science*, Feb 9, 1990, 247.

Debra L. Johnson, Jerry F. Franklin, and K. Norman Johnson, *Ecological Forest Management*. Waveland Press, 2018, 646 pp.

Tim Lahey (Forest Products Program Manager, Willamette National Forest). June 2015. "For the Greatest Good" (PowerPoint presentation).

Harvey Locke, "Nature Needs (At Least) Half: A Necessary New Agenda for Protected Areas" in *Protecting the Wild*, George Wuerthner, Eileen Crist and Tom Butler, eds., The Foundation for Deep Ecology and Island Press, 2015.

Information in this section from "Why Forests Need to be enlisted in climate change actions" by Dominick A. DellaSala, Ph.D., Chief Scientist Geos Institute, 2015, and from the talk on that subject by Dr. DellaSala at the 2015 Public Interest Environmental Law Conference, Eugene, OR.

Information from the Outdoor Industry Association website.

Information from the Oregon Office of Economic Analysis (<http://oregoneconomicanalysis.com/2015/08/12/oregonexports-2015-industries/>)

Andy Kerr, Oregon Wild: "Endangered Forest Wilderness".
<https://westerncascades.com/blog/>

Reed F. Noss, Jerry F. Franklin, William L. Baker, Tania Schoenagel and Peter B. Moyle, "Managing fire-prone forests in the western United States", *Frontiers in Ecology and the Environment*, 2006; 4(9): 481–487. Ecological Society of America

Thor D. Thorson, Sandra A. Bryce, Duane A. Lammers, Alan J. Woods, James M. Omernik, Jimmy Kagan, David E. Pater, Jeffrey A. Comstock. 2003. "Ecoregions of Oregon" (color poster with map, descriptive text, summary tables and photographs). USDI-Geological Survey. Reston, VA (map scale 1:1,500,000).

George Wuerthner, ed. *Wildfire; A Century of Failed Forest Policy*. Island Press, 2006, 322 pp.

Appendix A

Major Tree Species in the Proposed Douglas-Fir National Monument

Conifer Trees

While Douglas-fir is the most prevalent coniferous tree species in the proposed national monument, there are at least seventeen others:

- Alaska yellow cedar (*Chamaecyparis nootkatensis*)
- Douglas-fir (*Pseudotsuga menziesii*)
- dwarf (common) juniper (*Juniperus communis*)
- Engelmann spruce (*Picea engelmannii*)
- grand fir (*Abies grandis*)
- incense cedar (*Libocedrus decurrens*)
- lodgepole pine (*Pinus contorta*)
- mountain hemlock (*Tsuga metersiana*)
- noble fir (*Abies magnifica*)
- Pacific silver fir (*Abies amabilis*)
- Pacific yew (*Taxus brevifolia*)
- ponderosa pine (*Pinus ponderosa*)
- subalpine fir (*Abies lasiocarpa*)
- sugar pine (*Pinus lambertiana*)
- western hemlock (*Tsuga heterophylla*)
- western redcedar (*Thuja plicata*)
- western white pine (*Pinus monticola*)
- white fir/grand fir hybrid (*Abies concolor/Abies grandis*)

Interestingly, of the eighteen species or species hybrids listed above, all but two (incense cedar and sugar pine) are found on a mere quarter section (160 acres) on Echo Mountain Ridge in the heart of the proposed national monument.

Deciduous Trees

Non-conifer tree species include:

- big leaf maple (*Acer macrophyllum*)
- black cottonwood (*Populus trichocarpa*)
- chinquapin (*Castanopsis chrysophylla*)
- Oregon White oak (*Quercus garryana*)
- Pacific dogwood (*Cornus nuttallii*)
- Pacific Madrone (*Arbutus menziesii*)
- red alder (*Alnus rubra*)
- Sitka alder (*Alnus sinuate*)
- vine maple (*Acer circinatum*)

Appendix B

Lands Within the Proposed Douglas-Fir National Monument that Qualify for Inclusion in the National Wilderness Preservation System

There are a total of ~159,000 acres of roadless areas within the proposed national monument that qualify for, and should be included in, the National Wilderness Preservation System.

Existing Wilderness Areas

Mount Jefferson Wilderness Additions (23,854 acres). The Mount Jefferson Wilderness is magnificent already, but could be more biologically diverse with the addition of adjacent roadless lands that are at lower elevation and more forested with older forests. The South Breitenbush River National Recreational Trail in the proposed wilderness additions affords recognition but not protection.

Mount Washington Wilderness Additions (16,508 acres). The Mount Washington Wilderness is magnificent already, but could be more biologically diverse with the addition of adjacent roadless lands that are of lower elevation and more forested with older forests. The current wilderness boundary goes through Robinson Lake and kind of, but not really, follows a trail that goes in and out of the Wilderness several times.

Menagerie Wilderness Additions (1,906 acres). The Menagerie Wilderness was named after The Menagerie, a series of volcanic plug rock pinnacles that tower above the thick forest of mature Douglas-fir, western hemlock, and western redcedar.

Middle Santiam Wilderness Additions (9,219 acres). In 1984, when Congress established the Middle Santiam Wilderness, while it included very significant amounts of majestic old-growth forest (including Chimney Peak) adjacent comparable old growth was excluded. It would be added.

Opal Creek and Bull-of-the-Woods Wildernesses Additions (3,928 acres). These roadless lands are in the Breitenbush River watershed and a small portion of the Collawash River watershed that includes Elk Lake (but not the road into and the campground beside it) and Beachie Saddle.

Proposed Wilderness Areas

Bachelor Mountain Roadless Area (3,901 acres). Featuring several miles of ridgeline and canyon trails, it is a haven for songbirds and wildflowers and may be habitat for the critically endangered lynx. It also contains very large Engelmann spruce and sugar pine. Cascade peaks visible from here range from Mount Hood to Diamond Peak.

Box Canyon Roadless Area (2,582 acres). The area has steep rocky canyons and crags amid significant old growth forest. Runs of winter steelhead and spring chinook salmon probably spawned in the lower 1.5 miles below the first falls in Box Canyon Creek. The Army Corps of Engineers is required to improve anadromous fish passage so Box Canyon Creek could again host ocean-going salmonids—if habitat is maintained.

Blowout Creek (1,295 acres). Runs of winter steelhead and spring chinook salmon probably spawned in the lower two miles before Detroit Dam. The Army Corps of Engineers is required to improve anadromous fish passage so Blowout Creek could again host ocean-going salmonids—if habitat is maintained.

Byars Creek Roadless Area (1,616 acres). The area is a scenic backdrop to those driving the road along the Breitenbush River.

Browder Ridge Roadless Area (4,622 acres). Passing through old-growth forest, alpine meadows, and mature true fir forests, this rugged 4.4 mile hike treats you to views of Mount Jefferson, Mount Washington, and Three Sisters. There are abundant early summer wildflowers and many butterflies.

Carpenter Mountain Roadless Area (3,594 acres). Only a portion of the roadless area is within the proposed national monument; the remainder is within the H.J. Andrews Experimental Forest.

Cliff Creeks Roadless Area (1,323 acres). Cliff Creek flows into the Breitenbush River at the poplar Humbug Camp-ground.

Crabtree Valley Roadless Area (1,822 acres). An island of pristine forest surrounded by a sea of industrial clearcuts. The valley's old-growth Douglas-fir and western redcedar are perhaps 1,000 years old.

Gordon Meadows Roadless Area (10,125 acres). The area contains lakes and meadows in various stages of succession. Towering over them is Soapgrass Ridge. Here one will find the Millennium Grove, a unique stand of 700 to 900 year-old-growth Douglas-firs interspersed with other younger, 200 to 300 year-old trees. It also includes a Alaska cedar forest mosaic important to scientific research and a portion of the historic Santiam Wagon Road.

Hoover Ridge Roadless Area (2,305 acres). A scenic backdrop for anglers and boaters on Detroit Reservoir.

Iron Mountain and Cone Peak Roadless Area (8,808 acres), at the headwaters of the North, Middle and South Santiam Rivers, is home to over 300 species of flowering plants belonging to 18 distinct plant communities. Over 60 species found here are unusual or rare for the western Cascade Mountains, including *Ivesia gordonii*.

Jumpoff Joe Roadless Area (6,298 acres). An impressive rock outcropping that is easily seen from US Highway 20. The Old Santiam Wagon Road traverses the unit.

Moose Creek Roadless Area (5,528 acres). Moose Creek has a falls and is kayakable for the most hardy. Moose Creek is the lowest point of elevation in the proposed national monument and hosts spawning habitat for ocean-going salmon and steelhead.

Minniece Point Roadless Area (1,438 acres) in the geologically interesting Quartzville Creek watershed.

Olallie Lakes Roadless Area (~1,900 acres; total area 7,607 acres). The roadless area is within the Olallie Lakes Scenic Area and is known for its plethora of small lakes. A glaciated region, it is forested with noble fir, western hemlock, Pacific silver fir, mountain hemlock and other species. A portion of the Pacific Crest National Scenic Trail traverses the area.

Scorpion Mountain Roadless Area (4,868 acres) The roadless area is on the Collawash-Breitenbush Divide and includes a trail to the summit of Scorpion Mountain.

Tamolitch Falls Roadless Area (2,287 acres). The Upper McKenzie Wild and Scenic River flows through the area, which is larger than the narrow protected corridor of the wild and scenic river. The McKenzie River National Recreation Trail follows the river.

Three Pyramids Roadless Area (4,167 acres). These eroding volcanic plugs tower over flowery meadows, and huge noble firs.

Tidbits Mountain Roadless Area (5,339 acres). Hosts a very nice hike through old-growth forest.

Tumble Lake Roadless Area (2,460 acres). The Tumble Creek Trail goes through both mature and old-growth forest and open ridges with views of Mount Jefferson.

Wildcat Mountain Roadless Area (6,426 acres). A portion of the roadless area is a Research Natural Area, designated to represent ecosystems common to the Pacific Silver Fir Zone. It includes slopes of a moderately high mountain ridge with rocky cliffs, meadows, and brush fields, and first, second, and third order streams and associated wetlands. Late-successional Pacific silver fir forests, as well as cliff, talus, rock garden, and mesic meadow communities are also present. The predominant tree species is noble fir, but Pacific silver fir, Douglas-fir, and mountain hemlock are also common. Sitka alder is found in association with wetlands.

There are several other roadless areas that qualify for inclusion in the National Wilderness Preservation System: **Slate Rock** (2,598 acres); **Daly Lake** (1,295); **Mount Bruno** (3,239 acres); **White Bull Mountain** (1,273 acres); **Upper Soda** (1,131 acres); **Cook Creek** (1,877 acres); **Pyramid Creek** (2,310 acres); **Two Girls** (3,111 acres) and **Quentin Creek** (1,934 acres).

Appendix C

Free-flowing Streams and Waters Within the Proposed Douglas-Fir National Monument that Qualify for Inclusion in the National Wild and Scenic Rivers System

Portions or all of the following stream segments qualify for inclusion in the National Wild and Scenic Rivers System and are proposed to be:

- **Middle Santiam** (mainstem), **Pyramid** and **South Pyramid Creeks** (15.2 miles)
- **North Santiam** (mainstem) and **Whitewater Creek** (26.9 miles)
- **South Santiam** (mainstem), **Sevenmile**, **Latiwi**, **Sheep**, **Cub**, **Boulder**, **Moose**, and **Falls Creek** (45.6 miles)
- **Breitenbush** (mainstem), **North Fork Breitenbush River**, **South Fork Breitenbush Rivers**, and **French**, **East Fork Humbug**, and **Devils Creeks** (37.5 miles)
- **Crabtree Creek**, including Crabtree Lake (5.2 miles)
- **Lower Quartzville Creek** and **Yellowstone Creek** (8 miles)
- **Lava Lake** and **Park Creek** (9 miles)

Appendix D

EPA Level IV Ecoregions Within the Proposed Douglas Fir National Monument

The **Western Cascades Lowlands and Valleys** ecoregion includes the lower slopes of the Cascades. Its mild, wet climate promotes lush forests of western hemlock and Douglas-fir. Soils are warmer than in higher elevation ecoregions. The steep valleys contain high gradient rivers and streams that support cold-water salmonids, including the threatened Chinook salmon, steelhead and bull trout. Reservoirs store winter snowmelt for irrigation and municipal water supply in the Willamette Valley.

The **Western Cascades Montane Highlands** ecoregion is composed of steeply sloping, dissected mountains between about 3,000 and 6,500 feet elevation. The western Cascades are older and more eroded than the lava plateau and prominent snow-covered cones of the High Cascades (the Cascade Crest Montane Forest and Cascades Subalpine/Alpine Ecoregions); they are composed of dark basalt in contrast to the gray andesite of the High Cascades. The Western Cascades Montane Highlands has lower temperatures and receives more winter snow than the Western Cascades Lowlands and Valleys. Soils have frigid or cryic temperature regimes, in contrast to the mesic temperature regime of soils in the Western Cascades Lowlands and Valleys. Abundant precipitation supports forests dominated by Douglas-fir, western hemlock, noble fir and Pacific silver fir.

The **Cascade Crest Montane Forest** ecoregion consists of an undulating plateau punctuated by volcanic mountains and lava flows. Volcanism in the Pliocene epoch over-topped the existing Miocene volcanics of the Western Cascades Montane Highlands. Later Pleistocene glaciation left numerous naturally-fishless lakes. Today, this ecoregion contains forests dominated by mountain hemlock and Pacific silver fir. It has a shorter summer drought and fewer intermittent streams than the High Southern Cascades Montane Forest.

The **Cascades Subalpine/Alpine** ecoregion contains the prominent volcanic peaks of the High Cascades. Pleistocene glaciation reshaped the mountains above 6,500 feet, leaving moraines, glacial lakes and U-shaped glacial canyons. Glaciers and permanent snowfields still occur on the highest peaks. The vegetation is adapted to high elevations, cold winter temperatures, a short growing season, and deep winter snow pack. Herbaceous subalpine meadow vegetation and scattered patches of mountain hemlock, subalpine fir and whitebark pine occur near timberline.

Source: US Environmental Protection Agency. 2003 *Ecoregions of Oregon*.

Appendix E

The Douglas-Fir

The Douglas-fir is the state tree of Oregon and the second tallest tree species in the world, behind only the coastal redwood. It can grow to over 300 feet tall and up to 10 feet in diameter (far too large for one person to hug!) They can live for over 500 years, and the oldest known tree was 1,400 years old. Douglas-firs and other tree species in Crabtree Valley and the Millennium Grove are believed to be nearly 1,000 years old.

As the most common tree species in Oregon, it serves as the signature old-growth species in the proposed Douglas-Fir National Monument.

The Douglas-fir ecosystem supports not only the threatened northern spotted owl and one of its primary food sources, the red tree vole, but many other animals as well.

Elk and black-tailed deer, porcupines, the Douglas squirrel and other mice and voles use the Douglas-fir as sustenance. Any number of birds eat the seeds of Douglas-fir, including song, white-crowned and golden-crowned sparrows, dark-eyed junco, pine siskin, purple finch and red crossbills. Black bears are known to hibernate in the rotted-out cavities at the base of older Doug-firs. Porcupines eat the inner bark of younger Douglas-firs; seeds are very important food for mice, voles, shrews and chipmunks; the Douglas ground squirrel caches cones for use throughout the winter. All of these birds and mammals, and many more, use the Douglas-fir forest as a home during some or all of the year.

What's In a Name?

Pseudotsuga menziesii is scientifically named in honor of Archibald Menzies, a Scottish naturalist, botanist, and surgeon (1754-1842) who accompanied Royal Navy Captain George Vancouver who circumnavigated the globe (west to east), contacting five continents. One of those contact points was what we now call the Pacific Northwest, where Menzies “discovered” (it’s more accurate to say “described for western science”) the Douglas-fir in 1791.

The species is commonly named for another Scottish botanist, David Douglas, who sent some Douglas-fir seeds back to his motherland in 1827.

The genus name translates to “false hemlock.” The Douglas-fir has been variously called the Douglas spruce, red-fir, Oregon-pine, and Columbia pine. Neither spruce nor pine, it’s also not a “true fir” (*Abies* genus), despite its common name. (the hyphen in Douglas-fir was put there by botanists to signal it actually isn’t a true fir.)

There are three recognized variants of Douglas-fir:

- Coast (*P. menziesii* var. *menziesii*);
- Rocky Mountain (*P. menziesii* var. *glauca*); and
- Mexican (*P. menziesii* var. *lindleyana*).

“Glaucous” is Latin for bluish-gray, blue, or blue-green. The Coast variant tends to be a darker green than the Rocky Mountain variant, which, of course, is somewhat bluish. There is also a “bigcone Douglas-fir”, but it’s a different species (*P. macrocarpa*) found in the mountains of southern California. It is also known locally as bigcone spruce though, of course, it’s not a true spruce species.



Green shows the range of the coastal variety; blue shows the Rocky Mountain variety of Douglas-fir.

Map courtesy of Wikipedia

Appendix H

Native Wildlife Species in the Proposed Douglas Fir National Monument

Source: <https://oe.oregonexplorer.info/wildlife/wildlifeviewer/>

Amphibians

Bullfrog	<i>Rana catesbeiana</i>
Cascade torrent salamander	<i>Rhyacotriton cascadae</i>
Cascades frog	<i>Rana cascadae</i>
Clouded salamander	<i>Aneides ferreus</i>
Coastal tailed frog	<i>Ascaphus truei</i>
Dunn’s salamander	<i>Plethodon dunni</i>
Ensatina	<i>Ensatina eschscholtzii</i>
Foothill yellow-legged frog	<i>Rana boylei</i>
Long-toed salamander	<i>Ambystoma macrodactylum</i>
Northwestern salamander	<i>Ambystoma gracile</i>
Oregon slender salamander	<i>Batrachoseps wrightorum</i>
Oregon spotted frog	<i>Rana pretiosa</i>
Pacific chorus frog	<i>Pseudacris regilla</i>
Pacific giant salamander	<i>Dicamptodon tenebrosus</i>
Roughskin newt	<i>Taricha granulosa</i>

Southern torrent salamander
Western redback salamander
Western toad

Rhyacotriton variegatus
Plethodon vehiculum
Bufo boreas

Birds

Acorn woodpecker
American bittern
American coot
American dipper
American goldfinch
American kestrel
American pipit
American robin
American three-toed woodpecker
American wigeon
Anna's hummingbird
Ash-throated flycatcher
Bald eagle
Band-tailed pigeon
Bank swallow
Barn owl
Barn swallow
Barrow's goldeneye
Belted kingfisher
Bewick's wren
Black swift
Black tern
Black-backed woodpecker
Black-capped chickadee
Black-crowned night-heron
Black-headed grosbeak
Black-throated gray warbler
Blue-gray gnatcatcher
Blue-winged teal
Boreal owl
Brewer's blackbird
Brewer's sparrow
Brown creeper
Brown-headed cowbird
Bufflehead
Bullock's oriole
Burrowing owl
Bushtit
California gull
California quail
Calliope hummingbird
Canada goose
Canvasback
Cassin's finch
Cassin's vireo
Cedar waxwing

Melanerpes formicivorus
Botaurus lentiginosus
Fulica americana
Cinclus mexicanus
Carduelis tristis
Falco sparverius
Anthus rubescens
Turdus migratorius
Picoides dorsalis
Anas americana
Calypte anna
Myiarchus cinerascens
Haliaeetus leucocephalus
Patagioenas fasciata
Riparia riparia
Tyto alba
Hirundo rustica
Bucephala islandica
Ceryle alcyon
Thryomanes bewickii
Cypseloides niger
Chlidonias niger
Picoides arcticus
Poecile atricapillus
Nycticorax nycticorax
Pheucticus melanocephalus
Dendroica nigrescens
Polioptila caerulea
Anas discors
Aegolius funereus
Euphagus cyanocephalus
Spizella breweri
Certhia americana
Molothrus ater
Bucephala albeola
Icterus bullockii
Athene cunicularia
Psaltriparus minimus
Larus californicus
Callipepla californica
Stellula calliope
Branta canadensis
Aythya valisineria
Carpodacus cassinii
Vireo cassinii
Bombycilla cedrorum

Chestnut-backed chickadee	<i>Poecile rufescens</i>
Chipping sparrow	<i>Spizella passerina</i>
Cinnamon teal	<i>Anas cyanoptera</i>
Clark's nutcracker	<i>Nucifraga columbiana</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Common merganser	<i>Mergus merganser</i>
Common nighthawk	<i>Chordeiles minor</i>
Common poorwill	<i>Phalaenoptilus nuttallii</i>
Common raven	<i>Corvus corax</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Cordilleran flycatcher	<i>Empidonax occidentalis</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Dusky flycatcher	<i>Empidonax oberholseri</i>
Eared grebe	<i>Podiceps nigricollis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
European starling	<i>Sturnus vulgaris</i>
Evening grosbeak	<i>Coccothraustes vespertinus</i>
Ferruginous hawk	<i>Buteo regalis</i>
Flammulated owl	<i>Otus flammeolus</i>
Forster's tern	<i>Sterna forsteri</i>
Fox sparrow	<i>Passerella iliaca</i>
Gadwall	<i>Anas strepera</i>
Glaucous-winged gull	<i>Larus glaucescens</i>
Golden eagle	<i>Aquila chrysaetos</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Gray jay	<i>Perisoreus canadensis</i>
Gray-crowned rosy-finch	<i>Leucosticte tephrocotis</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Ardea alba</i>
Great gray owl	<i>Strix nebulosa</i>
Great horned owl	<i>Bubo virginianus</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Green heron	<i>Butorides virescens</i>
Green-tailed towhee	<i>Pipilo chlorurus</i>
Green-winged teal	<i>Anas crecca</i>
Hairy woodpecker	<i>Picoides villosus</i>
Hammond's flycatcher	<i>Empidonax hammondii</i>
Harlequin duck	<i>Histrionicus histrionicus</i>
Hermit thrush	<i>Catharus guttatus</i>
Hermit warbler	<i>Dendroica occidentalis</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Horned grebe	<i>Podiceps auritus</i>
Horned lark	<i>Eremophila alpestris</i>
House finch	<i>Carpodacus mexicanus</i>
House sparrow	<i>Passer domesticus</i>
House wren	<i>Troglodytes aedon</i>
Hutton's vireo	<i>Vireo huttoni</i>

Killdeer	<i>Charadrius vociferus</i>
Lark sparrow	<i>Chondestes grammacus</i>
Lazuli bunting	<i>Passerina amoena</i>
Lesser goldfinch	<i>Carduelis psaltria</i>
Lesser scaup	<i>Aythya affinis</i>
Lewis's woodpecker	<i>Melanerpes lewis</i>
Lincoln's sparrow	<i>Melospiza lincolnii</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Long-eared owl	<i>Asio otus</i>
Macgillivray's warbler	<i>Oporornis tolmiei</i>
Marsh wren	<i>Cistothorus palustris</i>
Mountain bluebird	<i>Sialia currucoides</i>
Mountain chickadee	<i>Poecile gambeli</i>
Mountain quail	<i>Oreortyx pictus</i>
Mourning dove	<i>Zenaida macroura</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Northern flicker	<i>Colaptes auratus</i>
Northern pintail	<i>Anas acuta</i>
Northern pygmy-owl	<i>Glaucidium gnoma</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Northern saw-whet owl	<i>Aegolius acadicus</i>
Northern shoveler	<i>Anas clypeata</i>
Olive-sided flycatcher	<i>Contopus cooperi</i>
Orange-crowned warbler	<i>Vermivora celata</i>
Osprey	<i>Pandion haliaetus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Pine grosbeak	<i>Pinicola enucleator</i>
Pine siskin	<i>Carduelis pinus</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Prairie falcon	<i>Falco mexicanus</i>
Purple finch	<i>Carpodacus purpureus</i>
Purple martin	<i>Progne subis</i>
Pygmy nuthatch	<i>Sitta pygmaea</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Red-breasted sapsucker	<i>Sphyrapicus ruber</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>
Red-necked grebe	<i>Podiceps grisegena</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Redhead	<i>Aythya americana</i>
Ring-billed gull	<i>Larus delawarensis</i>
Ring-necked duck	<i>Aythya collaris</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Rock pigeon	<i>Columba livia</i>
Rock wren	<i>Salpinctes obsoletus</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Ruffed grouse	<i>Bonasa umbellus</i>

Rufous hummingbird	<i>Selasphorus rufus</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Sandhill crane	<i>Grus canadensis</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Short-eared owl	<i>Asio flammeus</i>
Song sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Spotted owl	<i>Strix occidentalis</i>
Spotted sandpiper	<i>Actitis macularius</i>
Spotted towhee	<i>Pipilo maculatus</i>
Steller's jay	<i>Cyanocitta stelleri</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Townsend's solitaire	<i>Myadestes townsendi</i>
Townsend's warbler	<i>Dendroica townsendi</i>
Tree swallow	<i>Tachycineta bicolor</i>
Trumpeter swan	<i>Cygnus buccinator</i>
Turkey vulture	<i>Cathartes aura</i>
Varied thrush	<i>Ixoreus naevius</i>
Vaux's swift	<i>Chaetura vauxi</i>
Vesper sparrow	<i>Poocetes gramineus</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
Virginia rail	<i>Rallus limicola</i>
Warbling vireo	<i>Vireo gilvus</i>
Western bluebird	<i>Sialia mexicana</i>
Western grebe	<i>Aechmophorus occidentalis</i>
Western gull	<i>Larus occidentalis</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western meadowlark	<i>Sturnella neglecta</i>
Western screech-owl	<i>Megascops kennicottii</i>
Western tanager	<i>Piranga ludoviciana</i>
Western wood-pewee	<i>Contopus sordidulus</i>
White-breasted nuthatch	<i>Sitta carolinensis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
White-headed woodpecker	<i>Picoides albolarvatus</i>
White-tailed kite	<i>Elanus leucurus</i>
White-throated swift	<i>Aeronautes saxatalis</i>
White-winged crossbill	<i>Loxia leucoptera</i>
Wild turkey	<i>Meleagris gallopavo</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
Willow flycatcher	<i>Empidonax traillii</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Wilson's snipe	<i>Gallinago delicata</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
Wood duck	<i>Aix sponsa</i>
Wrentit	<i>Chamaea fasciata</i>
Yellow warbler	<i>Dendroica petechia</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>

Mammals

Allen's chipmunk	<i>Neotamias senex</i>
American badger	<i>Taxidea taxus</i>
American beaver	<i>Castor canadensis</i>
Belding's ground squirrel	<i>Spermophilus beldingi</i>
Big brown bat	<i>Eptesicus fuscus</i>
Black bear	<i>Ursus americanus</i>
Black-tailed deer	<i>Odocoileus hemionus</i>
Black-tailed jack rabbit	<i>Lepus californicus</i>
Bobcat	<i>Lynx rufus</i>
Brush rabbit	<i>Sylvilagus bachmani</i>
Bushy-tailed woodrat	<i>Neotoma cinerea</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
California myotis	<i>Myotis californicus</i>
California vole	<i>Microtus californicus</i>
Camas pocket gopher	<i>Thomomys bulbivorus</i>
Canada lynx	<i>Lynx canadensis</i>
Coast mole	<i>Scapanus orarius</i>
Common gray fox	<i>Urocyon cinereoargenteus</i>
Common porcupine	<i>Erethizon dorsatum</i>
Common raccoon	<i>Procyon lotor</i>
Coyote	<i>Canis latrans</i>
Creeping vole	<i>Microtus oregoni</i>
Dark kangaroo mouse	<i>Microdipodops megacephala</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Dusky-footed woodrat	<i>Neotoma fuscipes</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern gray squirrel	<i>Sciurus carolinensis</i>
Elk	<i>Cervus canadensis</i>
Fisher	<i>Martes pennanti</i>
Fog shrew	<i>Sorex sonomae</i>
Fringed myotis	<i>Myotis thysanodes</i>
Golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
Gray Wolf	<i>Canis lupus</i>
Gray-tailed vole	<i>Microtus canicaudus</i>
Heather vole	<i>Phenacomys intermedius</i>
House mouse	<i>Mus musculus</i>
Least chipmunk	<i>Neotamias minimus</i>
Little brown myotis	<i>Myotis lucifugus</i>
Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
Long-tailed vole	<i>Microtus longicaudus</i>
Long-tailed weasel	<i>Mustela frenata</i>
Mink	<i>Neovison vison</i>
Montane vole	<i>Microtus montanus</i>
Mountain beaver	<i>Aplodontia rufa</i>
Mountain goat	<i>Oreamnos americanus</i>
Mountain lion	<i>Puma concolor</i>
Muskrat	<i>Ondatra zibethicus</i>
Northern pocket gopher	<i>Thomomys talpoides</i>
Northern river otter	<i>Lontra canadensis</i>

Norway rat	<i>Rattus norvegicus</i>
Nutria	<i>Myocastor coypus</i>
Nuttall's cottontail	<i>Sylvilagus nuttallii</i>
Pacific jumping mouse	<i>Zapus trinotatus</i>
Pacific water shrew	<i>Sorex bendirii</i>
Pallid bat	<i>Antrozous pallidus</i>
Pinon mouse	<i>Peromyscus truei</i>
Red fox	<i>Vulpes vulpes</i>
Red tree vole	<i>Arborimus longicaudus</i>
Ringtail	<i>Bassariscus astutus</i>
Shrew-mole	<i>Neurotrichus gibbsii</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Siskiyou chipmunk	<i>Neotamias siskiyou</i>
Snowshoe hare	<i>Lepus americanus</i>
Striped skunk	<i>Mephitis mephitis</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
Townsend's chipmunk	<i>Neotamias townsendii</i>
Townsend's mole	<i>Scapanus townsendii</i>
Townsend's vole	<i>Microtus townsendii</i>
Trowbridge's shrew	<i>Sorex trowbridgii</i>
Vagrant shrew	<i>Sorex vagrans</i>
Virginia opossum	<i>Didelphis virginiana</i>
Water vole	<i>Microtus richardsoni</i>
Western gray squirrel	<i>Sciurus griseus</i>
Western jumping mouse	<i>Zapus princeps</i>
Western pocket gopher	<i>Thomomys mazama</i>
Western red-backed vole	<i>Myodes californicus</i>
Western spotted skunk	<i>Spilogale gracilis</i>
White-footed vole	<i>Arborimus albipes</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Wolverine	<i>Gulo gulo</i>
Yellow-bellied marmot	<i>Marmota flaviventris</i>
Yellow-pine chipmunk	<i>Neotamias amoenus</i>
Yuma myotis	<i>Myotis yumanensis</i>

Reptiles

Common garter snake	<i>Thamnophis sirtalis</i>
Gopher snake	<i>Pituophis catenifer</i>
Northern alligator lizard	<i>Elgaria coerulea</i>
Northwestern garter snake	<i>Thamnophis ordinoides</i>
Painted turtle	<i>Chrysemys picta</i>
Racer	<i>Coluber constrictor</i>
Ringneck snake	<i>Diadophis punctatus</i>
Rubber boa	<i>Charina bottae</i>
Sagebrush lizard	<i>Sceloporus graciosus</i>
Sharptail snake	<i>Contia tenuis</i>
Southern alligator lizard	<i>Elgaria multicarinata</i>
Western fence lizard	<i>Sceloporus occidentalis</i>
Western rattlesnake	<i>Crotalus oreganus</i>
Western skink	<i>Eumeces skiltonianus</i>
Western terrestrial garter snake	<i>Thamnophis elegans</i>