

EVERY LITTLE THING



MAPPING THE UNITED STATES' KEYSTONE FORESTS

The keystone forest map identifies select remaining areas of forests in the United States that Greenpeace has prioritized for increased protection, conservation and restoration. These areas are called “keystone” forests, borrowing from the architectural term for the middle stone at the top of an arch that holds all the other pieces in position. The keystone is the central cohesive source of support and stability for the greater whole.

It is important to note that these keystone forests are not the only lands that need increased protected status. Indeed, many critical forest areas, such as Vermont’s Green Mountain National Forest and Colorado’s Rio Grande National Forest, have been aggressively logged and the very survival of several species, such as the Canada lynx and Northern goshawk, depend on these areas being protected and restored. However, protecting our keystone forests to serve as biological cores—the heart of our nation’s largest unfragmented forest cover, is an excellent beginning. Although prioritizing these

keystone forests for protection is vital, it is only a complement, not a substitute, for detailed planning on a regional and local scale.

Included in each keystone forest description are some of the federally managed forest areas such as national parks, national forests and wilderness areas. For the most part, we have excluded naming state or county parks or significant areas of privately protected land with the notable exception of the Maine Keystone Forest where limited federal ownership exists. These types of protected areas, especially those adjoining federal lands can serve as an excellent basis for a larger protected area. When referring to a larger ecoregion to which a keystone forest is a part of, we reference ecoregion names used by the National Geographic/World Wildlife Fund “Wildworld Global 200” project that identified terrestrial ecoregion’s worldwide (see www.nationalgeographic.com/wild-world/terrestrial.html).



To create this map, the following process was used:

Step 1. Select quantifiable factors to represent distinct characteristics of forest quality.

Physical fragmentation (i.e., the size, condition and remoteness of each forest tract). Forest tract characteristics are derived from Conservation Biology Institute’s (CBI’s) values for “class area” and “total core area index.” We also use CBI’s values for mean road density within forested tracts to represent remoteness and human impacts.¹²

Presence of hotspots of biological diversity (i.e., the forests that are important to the greatest number of rare species). We give higher value to those areas that have been found to have at least moderate terrestrial rarity-weighted richness index and those

Forested BLM Lands (non-wilderness)	1,983,084
Forested National Forest Lands (non-wilderness)	45,312,755
Forested National Wildlife Refuge Lands (non-wilderness)	66,315
Forested National Park Lands (non-wilderness)*	3,874,146
Forested Wilderness	14,944,541
Forested miscellaneous public and private preserves	18,467,286**
Privately owned, unprotected forest lands	34,287,180
Total Forested Lands	118,935,307
*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.	
**Includes industrial forest lands in Maine	



watersheds that are “critical for conserving aquatic biodiversity.”¹³

Intactness of natural communities (i.e., forests that have most of their original parts in good working order). We give higher value to those areas in which the largest percentage of communities is intact, based on recent assessments of endangered communities.¹⁴

Step 2. Assign relative values for each factor and measure forested areas for each factor.

In our assessment, physical fragmentation is given the most importance. Hotspots of biological diversity are given an important, but secondary role. Community intactness rankings give additional value to those areas that have generally good ecological health, even if large numbers of rare species

may not be present.

Mapping software (GIS layers) is used to assign numeric values to represent each of the factors listed above. Forested areas are defined according to the U.S. Geological Survey National Land Cover Data set, which is consistent across the contiguous 48 states. This data does not include Alaska and Hawaii.¹⁵

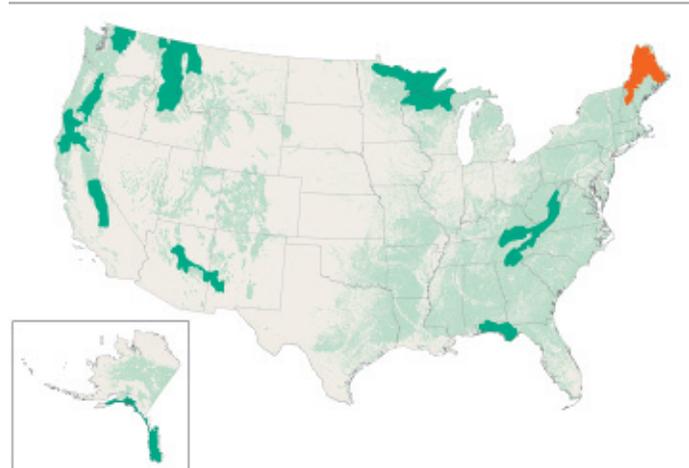
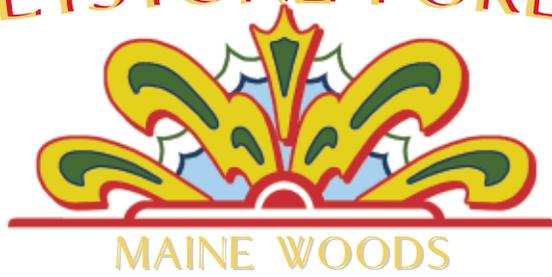
Alaska was not included in several of the studies from which we obtained fragmentation and hotspot data, so it was not possible to compare Alaska’s forests directly with those of the contiguous 48 states. We delineated the Alaska Keystone Forest by following the general boundaries of the most densely forested areas of coastal temperate rainforest within Southeast Alaska.¹⁶

Step 3. Sum of all factor values.

The overall value of a given forested location is the simple arithmetic sum of the numeric factors. Of all of the forested areas in the 48 contiguous states, we selected the top-rated 20 percent to represent the highest value forest. Where these forests form blocks of several million acres or more, we reviewed boundaries of national parks, wilderness areas, wildlife refuges, other public lands and private preserves, to identify America’s keystone forests.

One notable feature of this map is the relatively balanced geographical distribution of keystone forests. The large areas of unfragmented forests of the northern United States (many of which do not have great numbers of rare species) are well represented, as are the smaller, species-rich and critically important unfragmented forests of the southern United States.

KEYSTONE FOREST



Physical Description

Henry David Thoreau was so inspired by the forests of Maine in the mid-1800s that he proposed that it become a “national preserve.” Today, the 10 million-acre “Maine Woods,” part of the larger New England Acadian forest ecoregion, remain the largest undeveloped forest in the eastern United States. A mix of spruce-fir coniferous forest and beech-maple hardwood forest richly carpet this vast remnant of the legendary North Woods. Within this forest is a wide variety of native plant and wildlife species, including

moose, deer, black bear, beaver, loon, broad-winged hawk, blue-spotted salamander and brook trout. The region provides habitat for endangered and sensitive species such as the Atlantic salmon, bald eagle, spruce grouse, Canada lynx, pine marten, Northern bog lemming, blueback trout and small-whorled pogonia. There is also potential habitat for the restoration of extirpated species including the Eastern wolf, cougar, wolverine and woodland caribou.

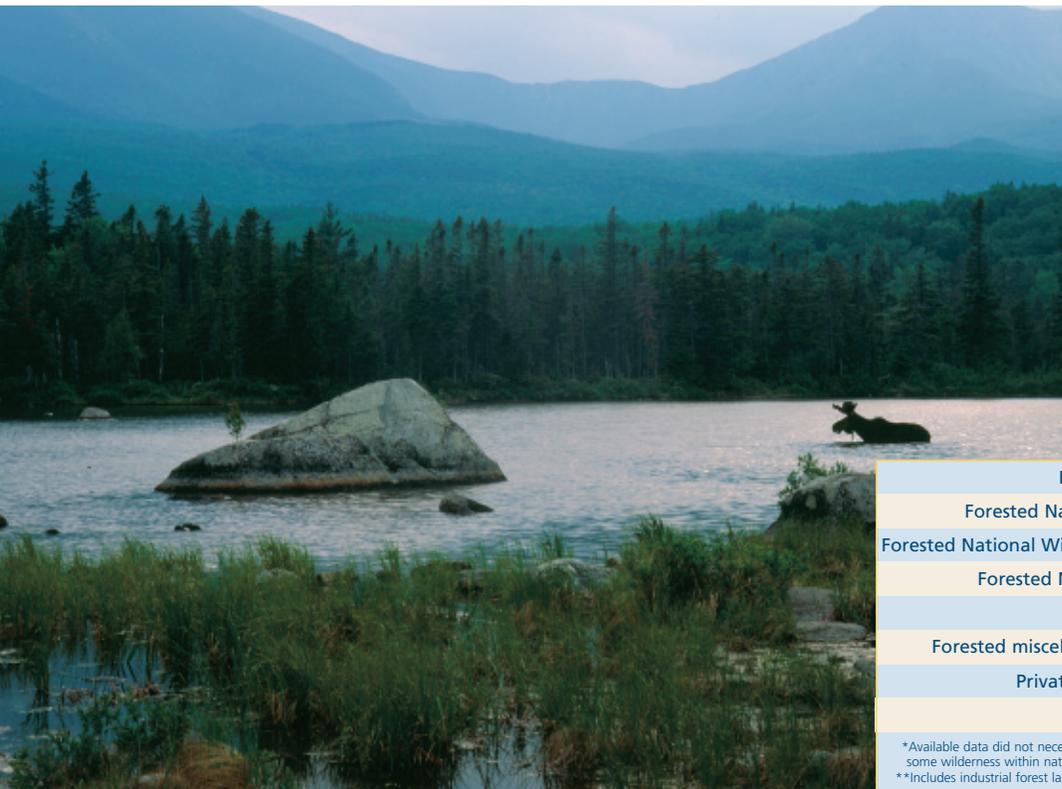
The landscape is mountainous, reaching its highest point on 5,271-foot

Mount Katahdin, dissected by major rivers such as the Allagash, Kennebec, Penobscot and St. John, and dotted with thousands of pristine lakes and ponds, including 75,000-acre Moosehead Lake. The Maine Woods play a critical environmental role as the headwaters of several major rivers, a massive carbon sink to help mitigate global warming, and a largely intact reservoir of native biodiversity. In the crowded northeastern United States, the Maine Woods offer outstanding backcountry recreation, particularly hiking, camping, canoeing, boating, fishing, hunting, cross-country skiing, snowshoeing, nature study and solitude.

Threats

Maine has one of the smallest percentages of public land of any state. Less than five percent is protected in public or private conservation ownership, and

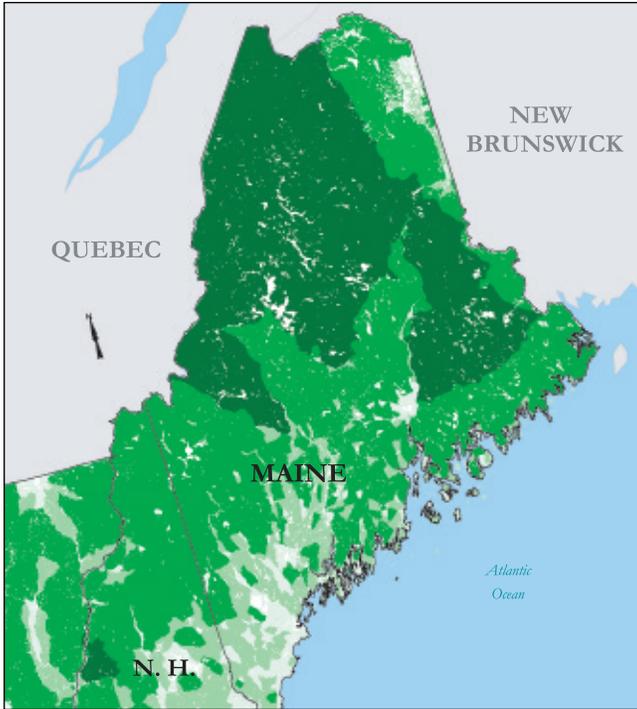
The Maine Woods are home to a variety of wildlife species including the moose shown here at Baxter Park.



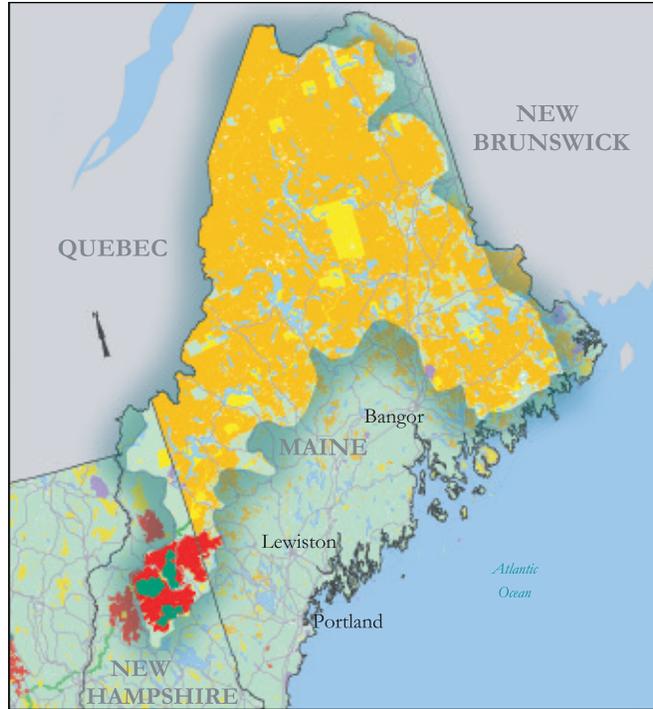
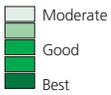
Forested BLM Lands (non-wilderness)	0
Forested National Forest Lands (non-wilderness)	458,636
Forested National Wildlife Refuge Lands (non-wilderness)	14,339
Forested National Park Lands (non-wilderness)*	2,162
Forested Wilderness	101,239
Forested miscellaneous public and private preserves	10,048,127**
Privately owned, unprotected forest lands	2,186,609
Total Forested Lands	12,811,112

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.
**Includes industrial forest lands in Maine

© GEORGE WNERTHNER



Forest Quality



Forest Ownership



less than one percent is preserved as wilderness. The famed "Appalachian Trail" begins in the Maine Woods, but it is only a thin "beauty strip" increasingly hemmed-in by clearcuts, roads and motorized recreation.

Transnational paper and timber companies, investment partnerships and real-estate speculators own most of the land in a few large blocks. During the last two decades these landowners have clearcut an area of forest larger than Delaware, built 15,000 miles of logging roads and subdivided remote lakeshores for second-home development. Intensive motorized recreation penetrates areas that were not long ago wild and roadless. More than five million acres of land have been sold in the last decade, with only a tiny portion being acquired by the public or other conservation buyers. Without the creation of new public parks and preserves, the Maine Woods will probably be irretrievably fragmented and

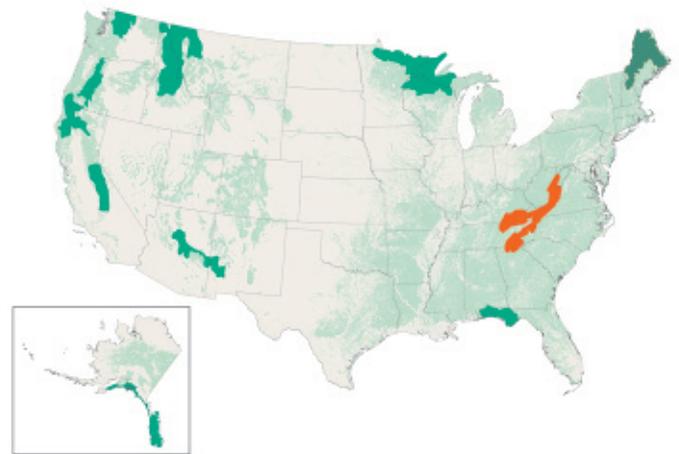
degraded within the next two decades.

Efforts to Increase Protected Areas

There is an existing proposal submitted to the National Park Service for the creation of a 3.2 million-acre Maine Woods National Park and Preserve in the heart of the Maine Woods. This new park would bring the land back into public ownership, restore past damage from logging and other industrial uses, guarantee public recreational access and serve as the foundation for a sustainable regional economy.

*Written by Michael Kellett
Restore the North Woods
www.restore.org*

KEYSTONE FOREST



Physical Description

The Blue Ridge-Appalachia Keystone Forest overlaps both the larger Appalachian mixed mesophytic forests and the Appalachian Blue Ridge forest ecoregions. They are some of the oldest and most biologically diverse temperate forests in the world. Due to the geologic and climatic stability of this region over the past 65 million years, a great number of plant and animal species have evolved specifically in this region, creating an environment rich with endemic species. The region also contains some of the last holdouts of

unlogged native forest in the eastern United States, including 130 hardwood tree species such as oaks, red maple, tulip poplar, chestnut and hickory. Also living in these forests are more than half the flowering plants and ferns in North America (more than 2,000 species). Coniferous trees also characterize this region with an overstory dominance of red spruce or Fraser fir. This region provides much-needed habitat for endangered species such as black bears, bald eagles and flying squirrels. Today, these forests contain more than 50

species of plants and animals formally listed as endangered or threatened, and more than 280 imperiled fresh water species.

The Appalachia forests have long been a major tourist destination for outdoor recreation activities such as fishing, hunting, hiking, kayaking and backpacking. Recreation in this area contributes a significant number of jobs and income to the region. Well-known recreation areas that contribute a significant number of jobs and income to the region include Great Smokey Mountain National Park, Big South Fork Recreation Area, and the George Washington-Jefferson and Monongahela National Forests.

Threats

This forest region is threatened by destructive logging practices (especially for woodchip demand), road-building and gas exploration. Air pol-

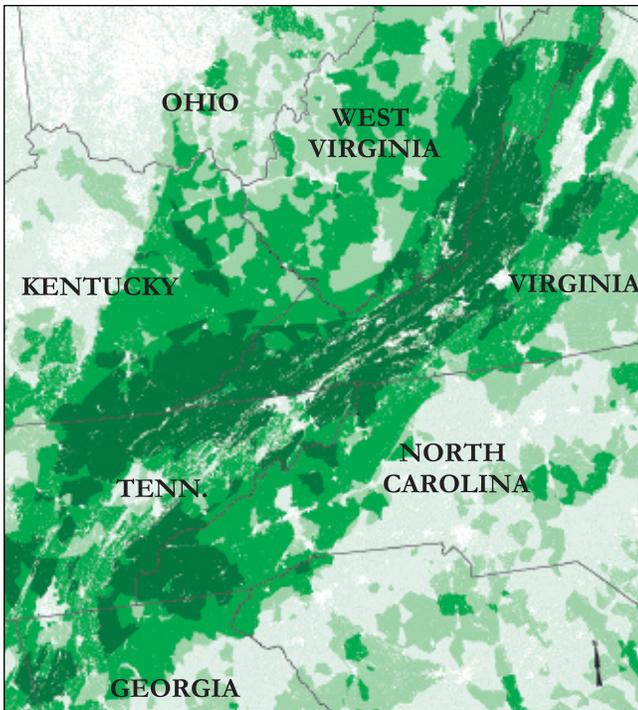
George Washington-Jefferson National Forest, Virginia.



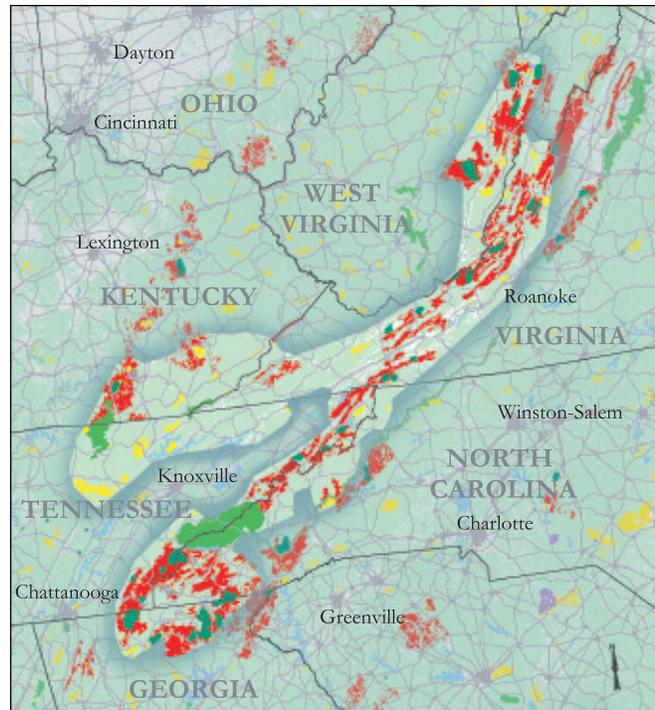
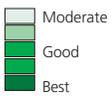
© DAVE MUHLY

Forested BLM Lands (non-wilderness)	0
Forested National Forest Lands (non-wilderness)	3,554,663
Forested National Wildlife Refuge Lands (non-wilderness)	504
Forested National Park Lands (non-wilderness)*	634,380
Forested Wilderness	343,923
Forested miscellaneous public and private preserves	559,803
Privately owned, unprotected forest lands	10,500,639
Total Forested Lands	15,593,912

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.



Forest Quality



Forest Ownership



lution, acid rain, invasive species and increasing urban sprawl heighten the immediate need for greater protected areas. Although the region has experienced more than a century of industrial logging, small remnants of native old-growth remain and much of the forest in the region that was clearcut a century ago are once again reaching maturity. Very little of this key-stone forest is under wilderness or national park status.

Efforts to Increase Protected Areas

There is a current proposal to create a new Blackwater Canyon National Park, which includes private lands in the canyon and key portions of the adjacent Monongahela National Forest.

The Ridge and Valley Wilderness and National Scenic Area Act of 2004, introduced by Representative Rick Boucher (D-VA) and Senator John Warner (R-VA) on April 22, 2004, would provide lasting protection for some 40,000

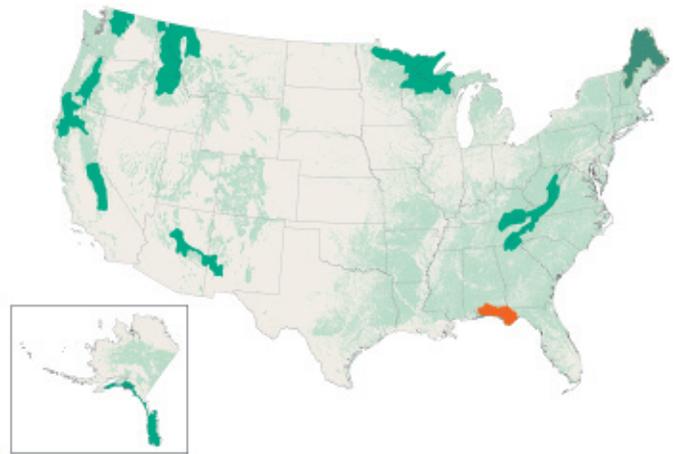
acres by establishing four new wilderness areas, two new scenic areas and expanding five existing wilderness areas in the Jefferson National Forest.

There are two other wilderness areas proposals. One proposal is the addition of 10,900 acres to the Laurel Fork Wilderness, and the second is the Little River Wilderness Proposal which would designate 28,000 acres as wilderness. The proximity of the Little River proposal to the Ramsey’s Draft Wilderness would create a large, relatively continuous natural area. Acreage from both proposals would come partially from the George Washington National Forest.

The West Virginia Wilderness Coalition has identified areas throughout the Monongahela National Forest that warrant protection, including places such as Seneca Creek, Spice Run and Roaring Plains.

*Written by Greenpeace
For more information, visit Southern Appalachian Forest Coalition
www.safc.org*

KEYSTONE FOREST



Physical Description

The Florida panhandle, centered on the Apalachicola River Basin and part of the larger Southeastern Conifer forest ecoregion, is a well-known hotspot for biodiversity. It is home to the richest endemic plant life in the south and 75 percent of Florida's plant species. These longleaf pine forests and their wiregrass understory also provide habitat for a host of rare species, including 36 federally threatened or endangered species such as the red-cockaded woodpecker, Eastern indigo snake, gopher tortoise and flatwoods

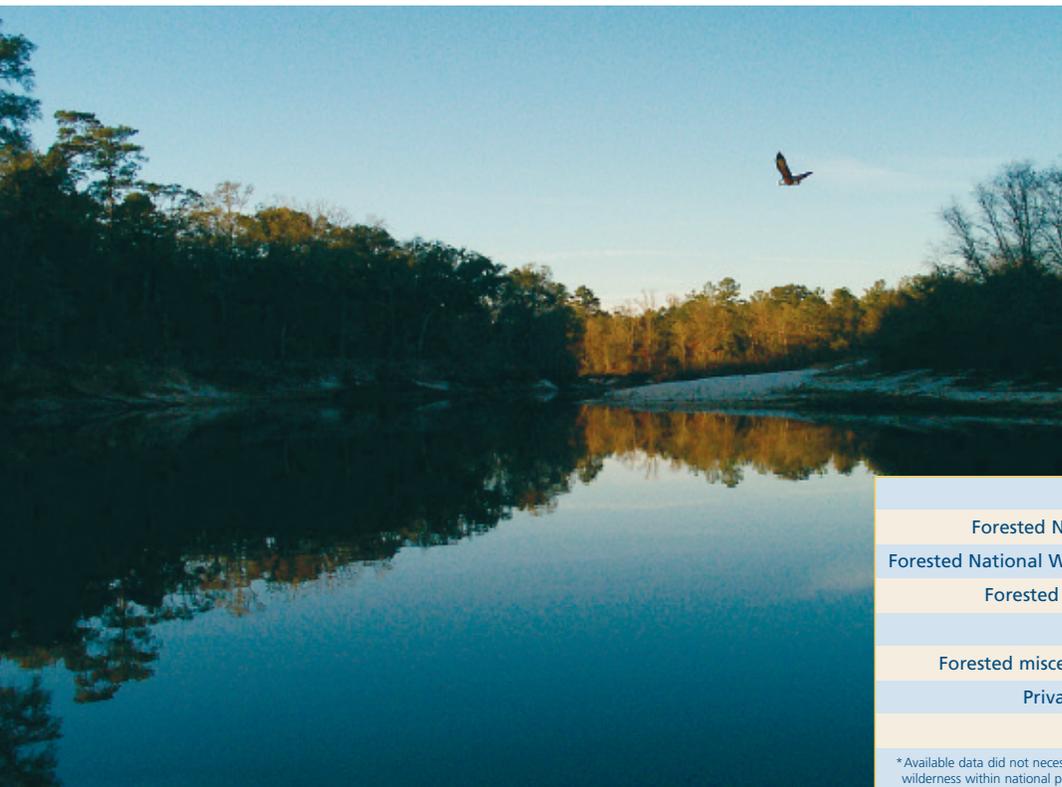
salamander. Other rare species, including Florida black bear, striped newt, Apalachicola king snake and Sherman's fox squirrel, are found here. Tree diversity and endemism is among the highest of any North American forest, with more than 190 tree species and 27 endemics. The wiregrass community contains some of the most diverse herbs in the world, with a single stand containing as many as 200 species.

The forests and numerous rivers of the Florida panhandle provide recreational opportunities for hunters, fish-

ermen, hikers, boaters and canoeists. In addition, the nutrient-rich fresh river water of the Florida panhandle makes the bays and estuaries along the Gulf Coast some of the most productive in the world. In fact, 10 percent of all the oysters harvested in the United States come from Apalachicola Bay.

Threats

The longleaf pine forests that once covered approximately 90 million acres from Virginia to Texas have been reduced to fewer than three million acres. Until very recently, the Florida panhandle had escaped the development pressures seen in the rest of the state. However, the largest landowner in the Florida panhandle, the St. Joe Company (formerly the St. Joe Paper Company), has recently decided to commercially develop the region and has begun selling off a significant portion



A Bald Eagle glides along the Ochlockonee River in the Apalachicola National Forest.

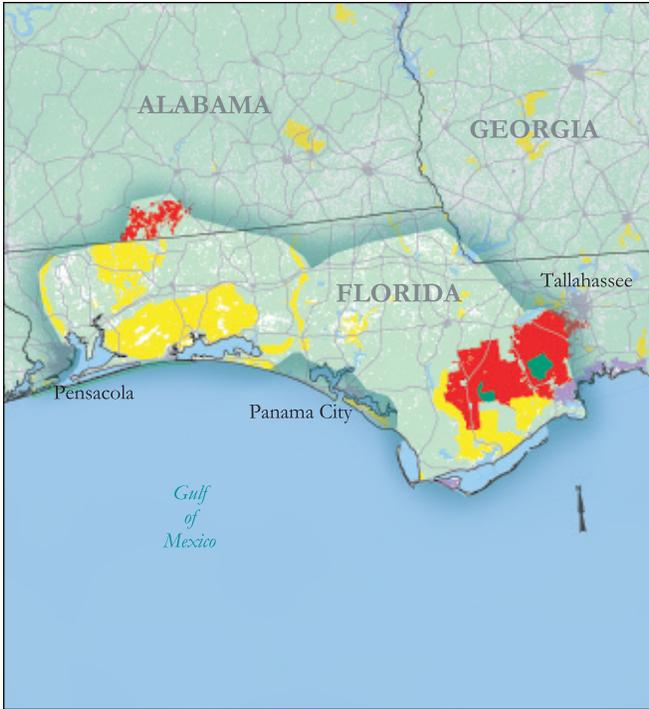
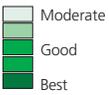
Forested BLM Lands (non-wilderness)	0
Forested National Forest Lands (non-wilderness)	589,994
Forested National Wildlife Refuge Lands (non-wilderness)	23,778
Forested National Park Lands (non-wilderness)*	1,297
Forested Wilderness	33,002
Forested miscellaneous public and private preserves	998,767
Privately owned, unprotected forest lands	3,210,596
Total Forested Lands	4,857,434

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© LAMAR MARSHALL



Forest Quality



Forest Ownership



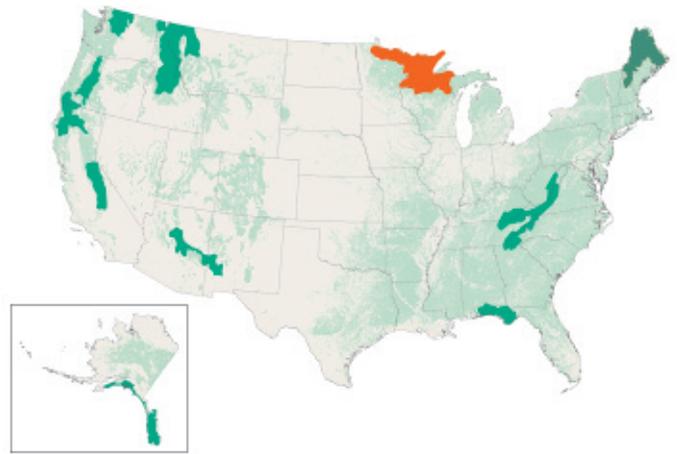
of its one million acres to land prospectors. Another threat to the longleaf pine ecosystems has been forestry practices on both public and private lands that have replaced the native longleaf pine forest with fast-growing slash pine plantations that retain only a fraction of the land’s original biodiversity. Fire, a natural regeneration process for the wiregrass community, has been suppressed. On public lands, largely unregulated off-road vehicle use is also increasing.

*Written by Brett Paben
WildLaw
www.wildlaw.org*

Efforts to Increase Protected Areas

The Nature Conservancy has a 6,000-acre preserve along the Apalachicola River and has recently signed a Memorandum of Partnership with the state of Florida and the U.S. Department of Defense to establish a 100-mile protected corridor that connects Eglin Air Force Base and the Apalachicola National Forest.

KEYSTONE FOREST



Physical Description

The Upper Great Lakes Keystone Forest is part of the larger Western Great Lakes forest ecoregion. Even today, the remote Upper Peninsula of Michigan, northern Wisconsin and Minnesota harbor some of the most expansive forests remaining in the lower 48 states. A mix of spruce-fir coniferous forest and a hardwood mix of aspen, paper birch, beech and maple dominate this keystone forest. This vast forest is home to most of the wolves and almost one-half of the bald eagles in the lower 48 states, as well as other sensitive wildlife

species including the fisher, black bear, loon, osprey and brook trout. There is also potential habitat for the recovery of extirpated or rare species such as the cougar, lynx, marten and wolverine. The most dominant feature of the region is water, with hundreds of miles of shoreline on Lake Superior; tens of thousands of lakes, ponds and wetlands; and thousands of miles of rivers and streams. This keystone forest is well-known for its diverse backcountry recreational opportunities, including hiking, camping, canoeing, boating, fishing, hunting, cross-country skiing,

snowshoeing, nature study and solitude.

Threats

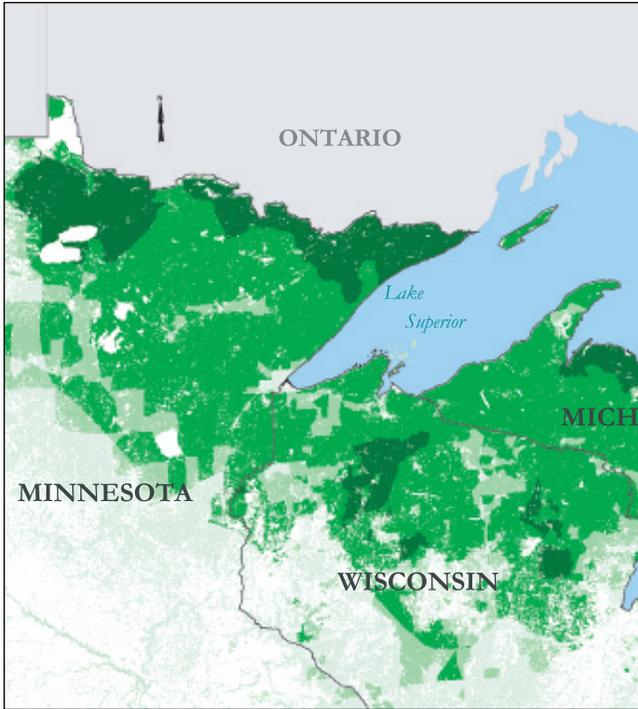
As the U.S. Forest Service has run out of areas to log in other regions, the rate of cutting has skyrocketed in the national forests of the Great Lakes. The state forests in the region have long been grossly mismanaged and continue to suffer major ecological damage from logging, road-building and intensive motorized recreation. A significant threat on both federal and state lands is widespread clearcutting to benefit commonly hunted wildlife, such as deer and ruffed grouse, to the detriment of many sensitive native species. Development on millions of acres of private inholdings and adjacent lands is a significant problem for the public lands of the region, as are expanding road networks and escalating levels of



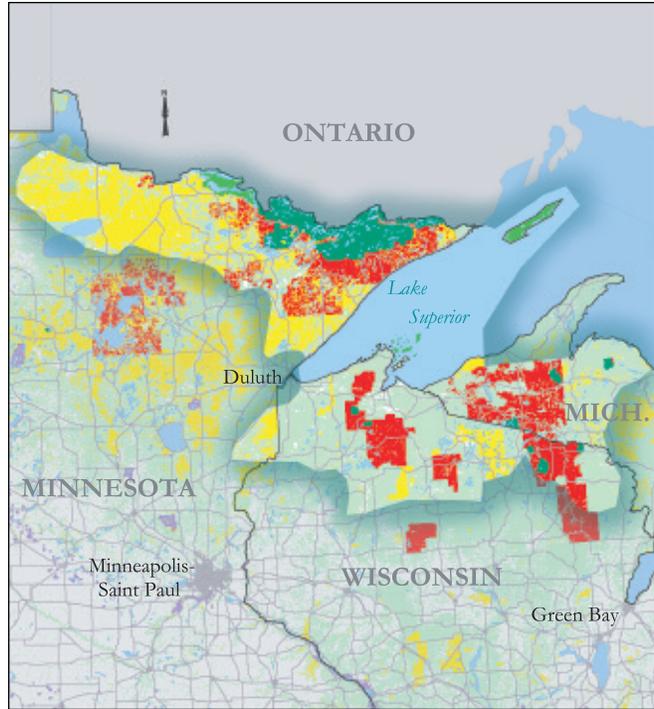
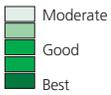
Chequamegon National Forest, Wisconsin.

Forested BLM Lands (non-wilderness)	25,868
Forested National Forest Lands (non-wilderness)	3,614,182
Forested National Wildlife Refuge Lands (non-wilderness)	0
Forested National Park Lands (non-wilderness)*	274,677
Forested Wilderness	940,474
Forested miscellaneous public and private preserves	4,263,189
Privately owned, unprotected forest lands	79,999,649
Total Forested Lands	17,117,462

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.



Forest Quality



Forest Ownership



off-road vehicle use. Without new national park or wilderness designations, the situation will certainly deteriorate in the coming years.

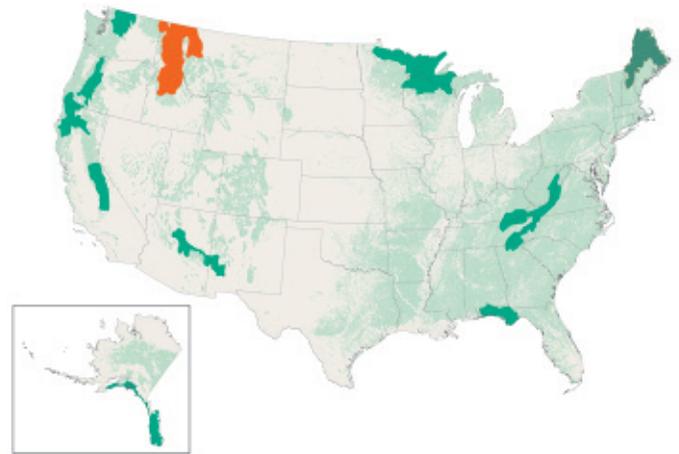
Efforts to Increase Protected Areas

Recent management plan revisions in Wisconsin’s Chequamegon-Nicolet National Forest (CNNF) claim an increase in protected areas from 71,864 acres to 184,600 acres, with 15,500 acres being proposed for wilderness designation. CNNF currently has 44,000 wilderness acres. In Michigan’s Ottawa National Forest, the Trap Hills Conservation Alliance is proposing a National Recreation Area that includes approximately 18,000 acres of wilderness. This draft proposal will be available to the public soon. Other remote areas in the Ottawa National Forest, as well as lands in the Hiawatha National Forest, Seney National Wildlife Refuge, Pictured Rocks National Lakeshore and Michigan state forests offer excellent

opportunities for protected area management.

*Written by Michael Kellett
Restore the North Woods and
Doug Cornett
Northwoods Wilderness Recovery
For more information, visit
www.northwoodswild.org and
www.hecenter.org*

KEYSTONE FOREST



Physical Description

Known as the “American Serengeti,” stretching across Idaho and Montana into the extreme northwest section of eastern Washington, the Northwest Rockies Keystone Forest is part of the greater North Central Rockies forest ecoregion. This keystone forest encompasses the largest expanse of biological diversity in the lower 48 states and contains the largest contiguous block of coniferous temperate forest in the Intermountain West. It is the only bioregion outside of Alaska that still contains all species present at

the time of the Lewis and Clark expedition. Many different forest types can be found here, ranging from wet forests full of cedar, fir and white pine to higher-elevation forests of lodgepole pine, white-bark pine and sub-alpine fir to drier, lower-elevation forests of Ponderosa pine and Douglas fir. Populations of bighorn sheep, grizzly bear, goshawk, elk, caribou and mountain lion roam the region’s forests, mountains and grasslands. Keystone species such as grizzly bear, woodland caribou and bull trout have been listed as threatened and endan-

gered. Much of the nation’s fresh water originates here creating the headwaters for the Columbia River, the Missouri River and even for water draining north into Canada’s Hudson Bay.

This keystone forest is a haven for outdoor enthusiasts who use the area for fishing, hunting, backpacking, rock climbing, mountain biking, fly fishing, skiing, scenic and whitewater paddling and camping. Additionally, many locals use these forests to gather mushrooms, berries and other edibles.

Threats

This keystone forest continues to face a myriad of industrial threats from large-scale logging, mining and oil and gas companies. More than 20 million acres of publicly-owned wild lands remain unprotected. Iconic places such as the Rocky Mountain Front, the North Fork of the Flathead River near Glacier

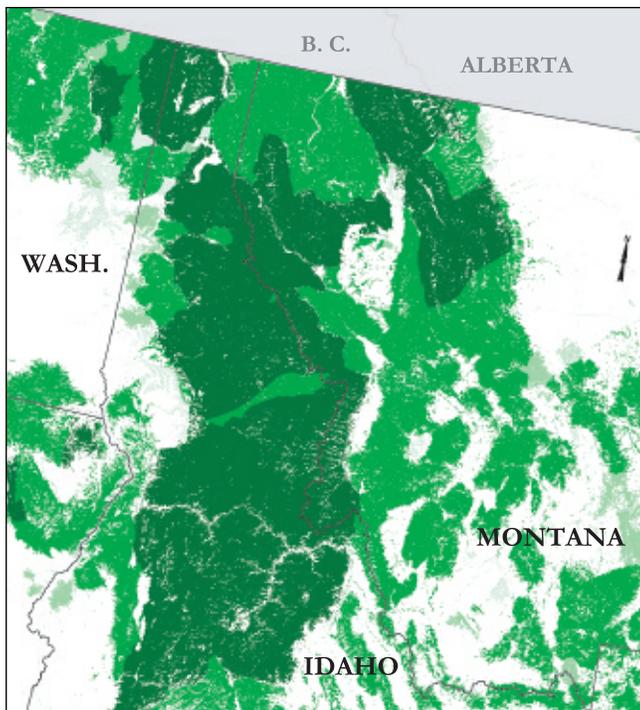
Bitterroot National Forest.



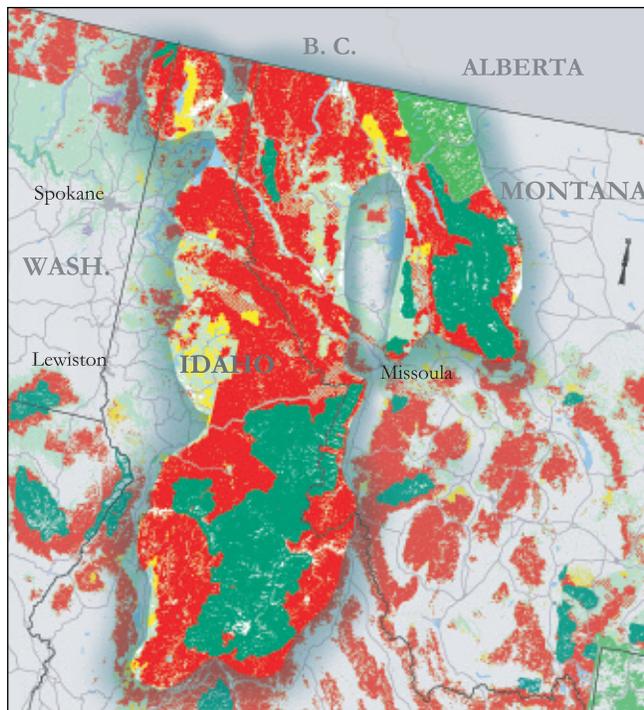
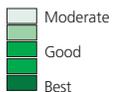
© BOB CLARK

Forested BLM Lands (non-wilderness)	146,418
Forested National Forest Lands (non-wilderness)	12,892,751
Forested National Wildlife Refuge Lands (non-wilderness)	1,297
Forested National Park Lands (non-wilderness)*	777,195
Forested Wilderness	5,039,447
Forested miscellaneous public and private preserves	944,869
Privately owned, unprotected forest lands	3,287,552
Total Forested Lands	23,089,529

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.



Forest Quality



Forest Ownership



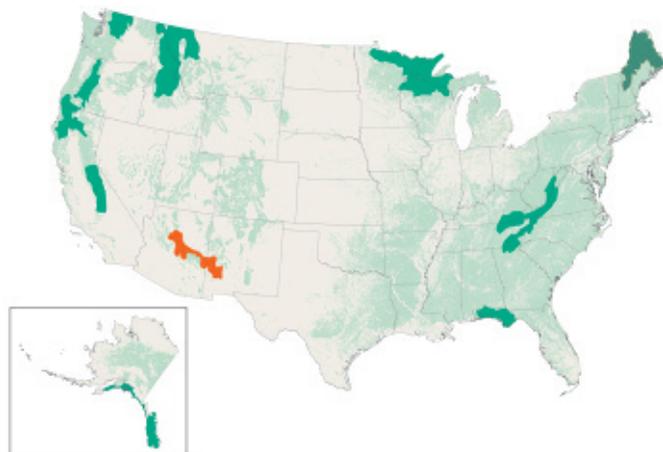
National Park, and the Lewis and Clark Trail in the Clearwater National Forest are all at risk. A relatively new and growing threat comes from off-road vehicles that cause both ecological damage and social conflict.

*Written by Jake Kreilick
National Forest Protection Alliance
www.forestadvocate.org*

Efforts to Increase Protected Areas

The Northern Rockies Ecosystem Protection Act (NREPA) proposes a wide array of wilderness designations throughout the region. In contrast to traditional state wilderness bills, designations under NREPA are made according to ecosystems, watersheds and science—not arbitrary political boundaries. NREPA would create more than 18 million acres of new wilderness and designate 1,810 miles of eligible waters as Wild, Scenic and Recreational Rivers. NREPA provides the means to connect the Northwest Rockies Keystone Forest with the neighboring Hells Canyon and Greater Yellowstone ecosystems.

KEYSTONE FOREST



Physical Description

Stretching from Flagstaff, Arizona almost to the Rio Grande Valley in New Mexico, the Mogollon Keystone Forest marks the southern edge of the Colorado Plateau where it meets the great Sonoran and Chihuahuan deserts. It is part of the larger Arizona Mountains forests ecoregion. The prominent feature is a long escarpment, known as the Mogollon Rim, that extends for several hundred miles, with an average elevation of 7,000 feet.

The Mogollon Keystone Forest is

best characterized by its vast stands of Ponderosa pine, the largest of its kind in the United States, but also is marked by the pinyon-juniper ecosystem of the upper deserts to the high elevation spruce fir forests. The effects of grazing, logging and fire suppression since the late 1880s on Ponderosa pine forests have been profound. Fire, a critical component to the Ponderosa pine ecology, has been very suppressed for many years. There are currently many efforts, some controversial, to restore this ecological process. In 1991, the National Biological Survey declared the

Southwest Ponderosa pine forests one of the nation's most endangered ecosystems.

The Blue Range of Arizona and New Mexico is currently the site of the 7,000 square-mile Mexican gray wolf recovery area. The jaguar, having once roamed these same landscapes, has made recent forays across the U.S./Mexico border. The tassel-eared Abert's squirrel, mule deer, rocky mountain elk and two seriously imperiled bird species, the Mexican spotted owl and Northern goshawk, also live among the pines.

Critical to the wildlife and human populations of this arid region are its rivers; the most notable being the Gila, Verde, San Francisco and Blue. The Wild and Scenic Verde River is the only river in this keystone forest area that has this status. However several other rivers, including the San



Gila National Forest, New Mexico.

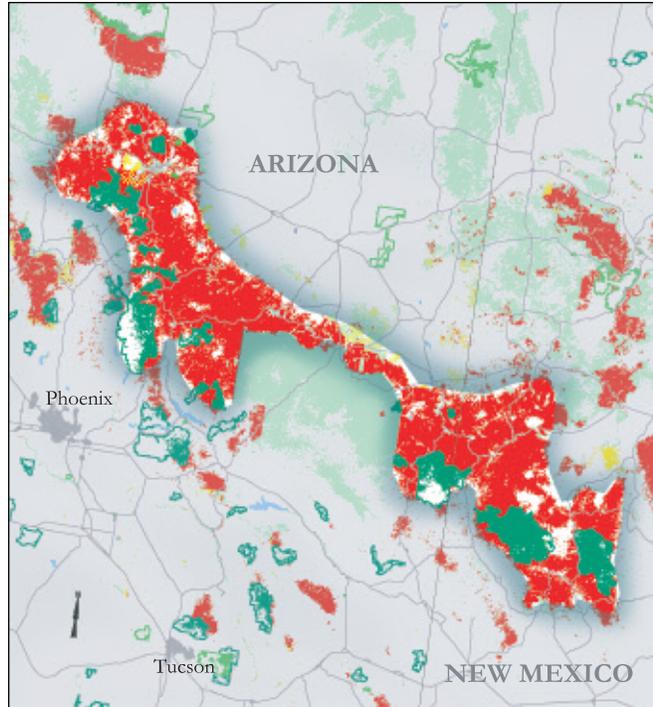
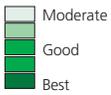
Forested BLM Lands (non-wilderness)	14,123
Forested National Forest Lands (non-wilderness)	5,163,744
Forested National Wildlife Refuge Lands (non-wilderness)	0
Forested National Park Lands (non-wilderness)*	3,459
Forested Wilderness	937,303
Forested miscellaneous public and private preserves	62,833
Privately owned, unprotected forest lands	349,759
Total Forested Lands	6,531,221

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© USFS



Forest Quality



Forest Ownership



Francisco, are strong candidates. Wilderness areas along the Mogollon Country include San Francisco Peaks, Matazal, Mount Baldy and Blue Wallow, Gila-Aldo Leopold Complex and Blue River Primitive Area. These protected areas are considered biological hotspots.

Threats

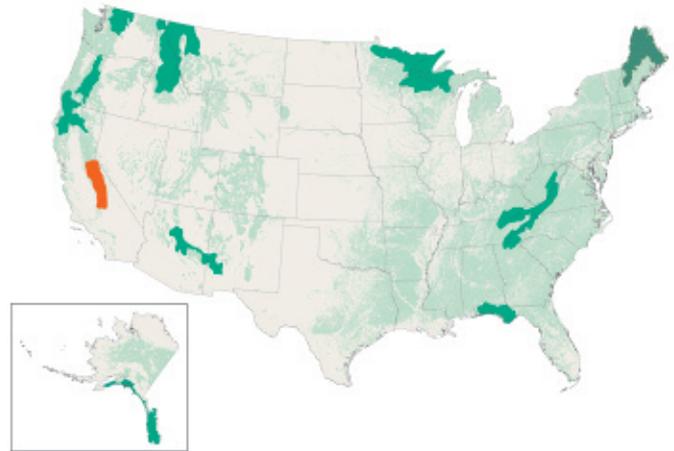
The major threats to the Mogollon Keystone Forest include logging, road-building, mineral extraction, grazing and water diversion for human consumption. Old-growth logging, however, is not entirely an anachronism, as “forest health” has become the latest dictum of the federal government. The string of federal wilderness serves as anchors for this wild, ponderosa country, but the growing wildland-urban interface presents unique challenges, e.g., maintaining the fire-based ecology.

Efforts to Increase Protected Areas

Several organizations are advocating for greater protection of the Sky Islands ecoregion, as well as the greater Mogollon Keystone Forest area, by reforming land management policies and creating national and international reserves.

*Written by Bryan Bird
Forest Guardians
www.fguardians.org*

KEYSTONE FOREST



Physical Description

The Sierra Keystone Forest, part of the larger Sierra Nevada forest ecoregion, hosts one of the most diverse and extensive forest ecosystems in North America. These magnificent forests, forming a mixed conifer forest landscape, provide habitat for many imperiled species, including the California spotted owl, Pacific fisher, Northern goshawk, American marten, Yosemite toad and the mountain yellow-legged frog. This keystone forest contains one of the highest levels of mammal endemism in North America. The for-

est is extremely diverse including the mixed conifer and sequoia forests at higher elevations, the red fir and lodgepole pine forests at lower elevations. The Sequoia National Forest and Monument contains the world-renowned groves of giant Sequoia trees that are among the oldest and largest trees in the world. The Inyo National Forest is one of the most used national forests in the country for recreation.

In most Sierra Nevada counties over the past 25 years, the primary areas of growth in the economy have been in

the areas of recreation and tourism, currently providing more jobs and roughly the same total amount of wages as all the commodity-based sectors combined. Recreation includes hiking, boating, hunting, rock climbing and fishing. This keystone forest, in particular, provides a significant proportion of California's drinking and agricultural water, including all the drinking water for San Francisco.

Threats

In 2001, the historic Sierra Nevada Forest Plan Amendment ("the Framework"), affecting 11.5 million acres in 11 national forests, was signed into law. The Sierra Nevada Forest Plan Amendment was the result of 14 years of research, planning and cooperative efforts by the Forest Service, scientists, community activists, business owners and environmentalists. The Framework was the Forest Service's first compre-

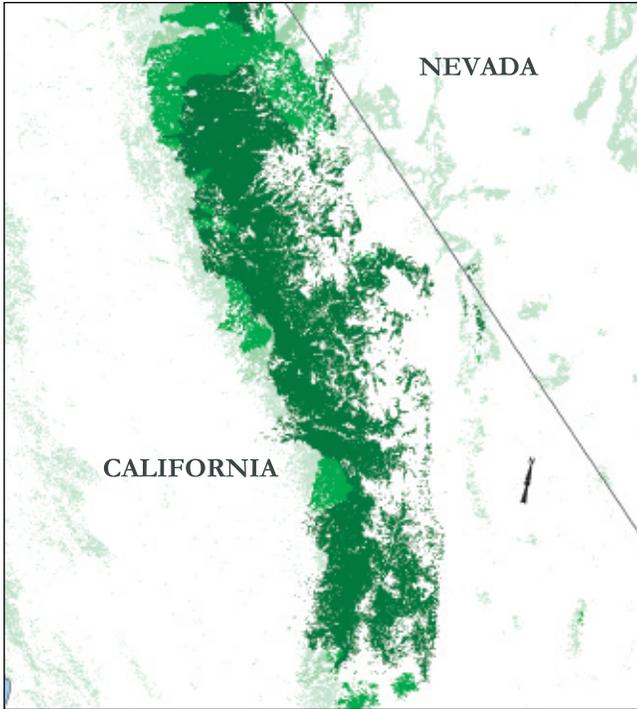


Sequoia National Park, California.

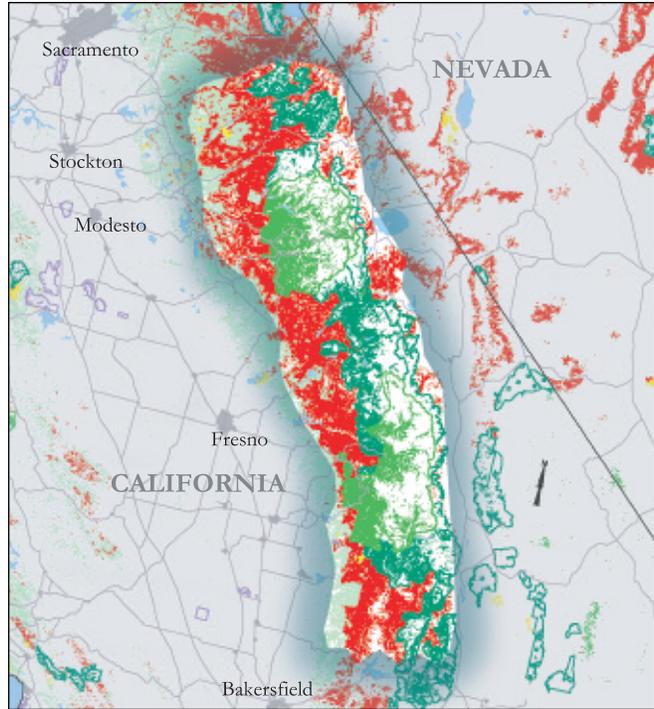
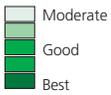
Forested BLM Lands (non-wilderness)	116,659
Forested National Forest Lands (non-wilderness)	2,099,926
Forested National Wildlife Refuge Lands (non-wilderness)	1,153
Forested National Park Lands (non-wilderness)*	817,691
Forested Wilderness	837,434
Forested miscellaneous public and private preserves	21,545
Privately owned, unprotected forest lands	732,593
Total Forested Lands	4,627,001

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© MARK LINNEMAN/GREENPEACE



Forest Quality



Forest Ownership



hensive, Sierra-wide plan to reduce the threat of wildfire and to protect forest habitat. It included: 1) a commitment to restore and protect old-growth forest conditions, including all existing old-growth stands one acre or larger; 2) a prohibition against the cutting of large trees (20 inches diameter or greater); and 3) protection for imperiled aquatic species by establishing a comprehensive aquatic and riparian habitat conservation strategy for all of the national forest lands in the Sierras. Despite widespread support for this plan, the Forest Service, responding to pressure from the Bush administration, announced sweeping revisions to the Framework. The revisions nearly triple the amount of logging on national forests and limit safeguards for water and wildlife.

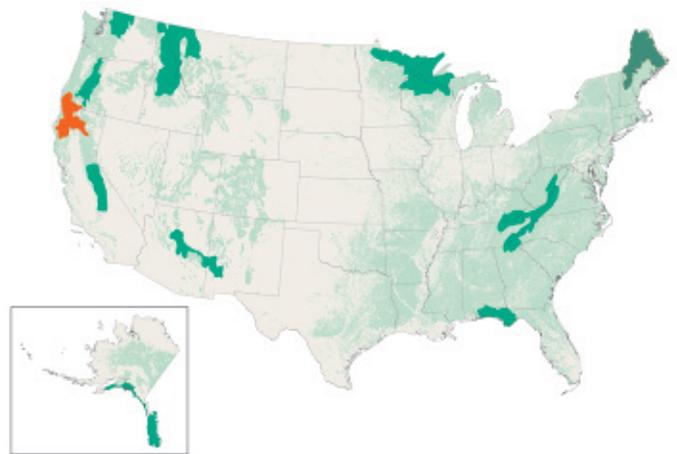
This keystone forest is also threatened by livestock grazing, conversion to tree plantations, fire suppression, air pollution and pathogens.

Efforts to Increase Protected Areas

The California Wild Heritage Act (S.1555) would designate some 2.5 million acres of wilderness in California and create more than 400 miles of Wild and Scenic Rivers. Many of these additions are located within the Sierra Keystone Forest.

*Written by David G. Graves
Sierra Nevada Forest Protection
Campaign
www.sierracampaign.org*

KEYSTONE FOREST



Physical Description

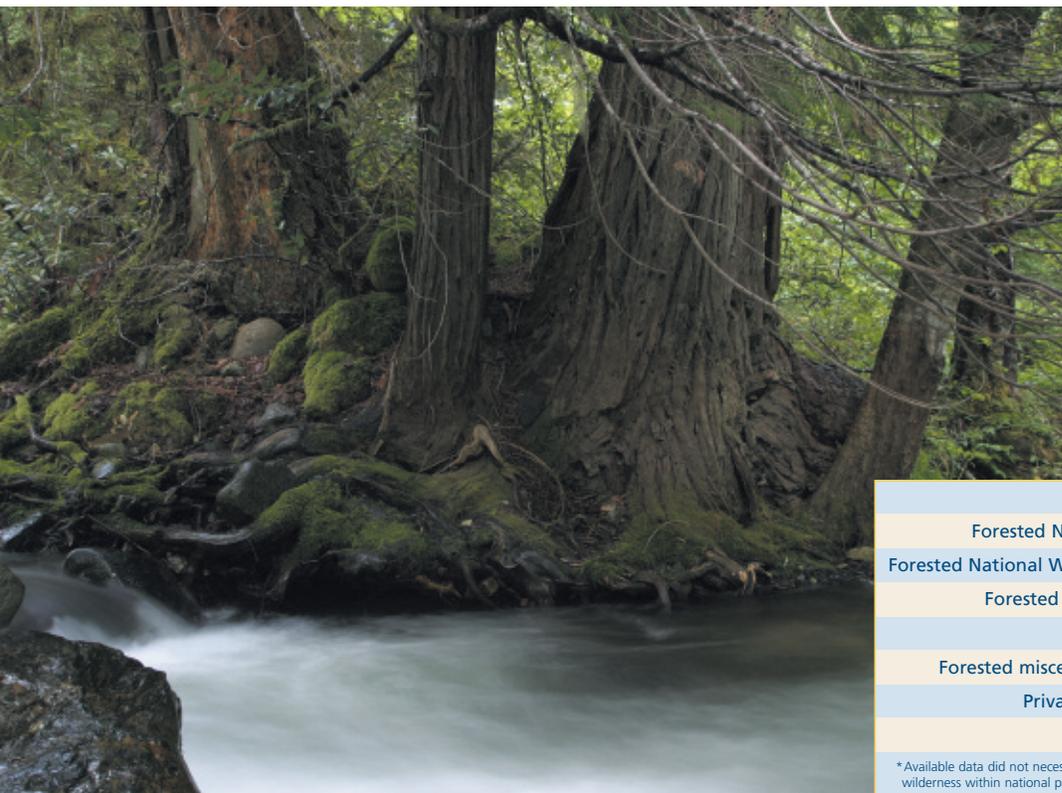
The Klamath-Siskiyou Keystone Forest ranging from Southwest Oregon to Northwest California is an area world-renowned for its biological importance and considered an “Area of Global Botanical Significance” by the World Conservation Union. It has also been proposed as a possible World Heritage Site and a United Nations Educational, Scientific and Cultural Organization Biosphere Reserve. This forest also has the largest network of remaining roadless wilderness in the Pacific Northwest, including the low-elevation 45,000-acre

Zane Grey.

The Klamath-Siskiyou Keystone Forest is a mixed conifer temperate forest that includes up to 40 species of conifers, the highest concentration in North America. Douglas fir is the dominant conifer. The forest also includes several long-lived species of pine and fir and endemic tree species such as Port Orford cedar and Brewer’s spruce. The Klamath-Siskiyou has 3,500 plant types, 220 of them found nowhere else in the world. There are also wilderness areas large enough to support the mountain lion, black bear, several

species of Pacific salmon, the tailed frog and various carnivores such as the Pacific fisher, pine marten, mountain lion and wolverine. Endangered species include the Northern spotted owl, marbled murrelet, bald eagle and coho salmon.

Three main river systems define the region: the Umpqua and the Rogue in the north and the Klamath in the south, with many large tributaries and coastal rivers adding to the mix. The Rogue, Illinois and Trinity Rivers are among those that give the Klamath-Siskiyou the largest concentration of Wild and Scenic Rivers in the United States. In these rivers are four imperiled fish species: the lost river sucker, the shortnose sucker and the commercially valuable Northern California coho salmon and steelhead trout. The area also provides excellent drinking water for local communities and offers world-class fishing, hunting, boating, rafting,



Port Orford cedar in the Siskiyou National Forest, Oregon.

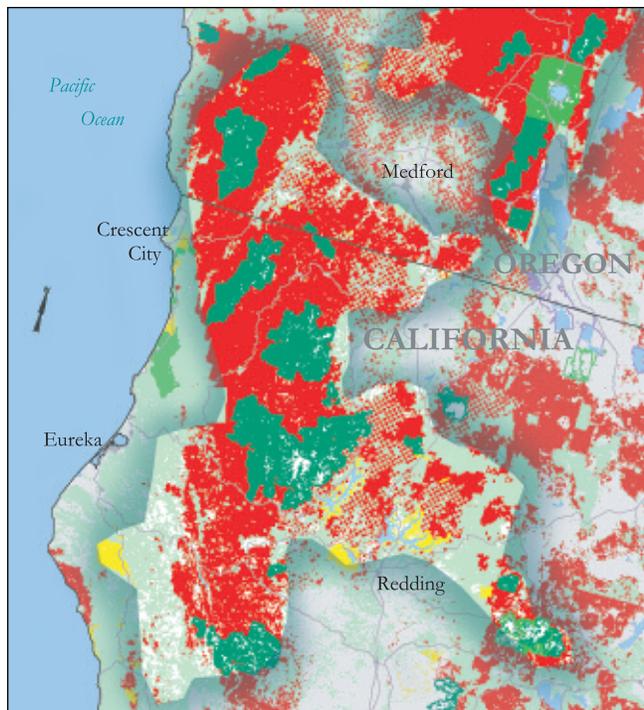
Forested BLM Lands (non-wilderness)	511,885
Forested National Forest Lands (non-wilderness)	3,766,652
Forested National Wildlife Refuge Lands (non-wilderness)	0
Forested National Park Lands (non-wilderness)*	16,933
Forested Wilderness	1,238,498
Forested miscellaneous public and private preserves	201,324
Privately owned, unprotected forest lands	2,271,563
Total Forested Lands	8,006,855

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© DANG NGO/GREENPEACE



Forest Quality



Forest Ownership



climbing and hiking opportunities. Non-timber resources such as mushrooms, cedar boughs and fisheries contribute significant revenue to local communities.

Threats

Commercial logging, primarily of old-growth, by the Bureau of Land Management, the Forest Service and private industrial land owners is a huge threat to this keystone forest. Federal logging operations, such as the Biscuit Salvage, are among the largest in the nation and typically include inappropriate responses to fire such as logging fire-resistant trees before, during and after fires. Mining is also a severe threat to this forest. The antiquated 1872 Mining Law allows miners to bulldoze and suction-dredge prime salmon spawning habitat, degrade river banks, pollute sensitive areas and even privatize public lands. In addition, a non-

native root disease is killing entire populations of the endemic Port Orford cedar (considered the most endangered forest tree species in North America). Off-road vehicles are another menace, damaging sensitive plant communities, wildlife habitat and riparian areas through erosion, soil compaction, noise and pollution. Cattle grazing harms stream sides where cows congregate, often in high elevation roadless and wilderness areas in the last summer months.

Efforts to Increase Protected Areas

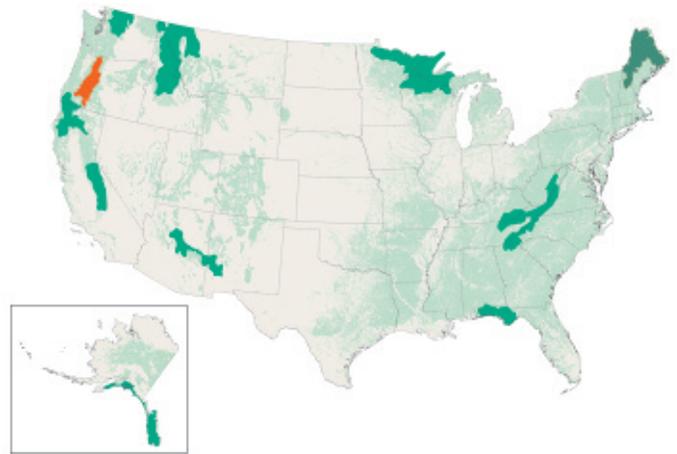
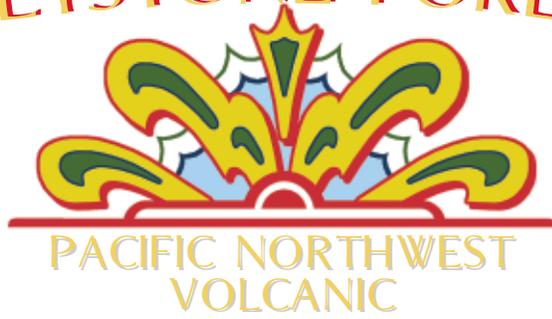
The proposed California Wild Heritage Act (S.1555) would expand several wilderness areas in the southern extent of this keystone forest. Also included in this bill are proposed Wilderness Study Areas, as well as Salmon Restoration Areas.

A coalition of groups has also proposed the Siskiyou Wild Rivers Area for protection. This area encompasses

one million acres that includes all or portions of the Siskiyou National Forest and the BLM Medford District. The coalition is seeking a combination of increased wilderness areas adjacent to the Kalmiopsis, additions to National Research Areas and Wild and Scenic Rivers and restoration zones which will also help protect the ecological integrity of the wildest, most intact forest left on the Pacific Coast.

*Written by Joseph Vail
KS Wild
www.kswild.org*

KEYSTONE FOREST



Physical Description

The Pacific Northwest Volcanic Keystone Forest is part of the larger Central and Southern Cascade forests. This keystone forest is straight out of a storybook: cascading waterfalls, crystal clear streams and rivers and ancient rainforests. Most of this keystone forest contains the dominant conifers of Douglas fir, Western hemlock, Western red cedar, incense cedar, Pacific yew and a myriad of true fir. At lower elevations, hardwoods such as big leaf maple, vine maple and dogwood are present. The Northern spotted owl is

the most well-known endangered species in the area. However, other threatened species such as the bald eagle, bull trout and a host of salmon also reside in this area. Waldo Lake, considered one of the purest lakes in the world, is located near the Cascade Crest, 60 miles southeast of Eugene. The city of Eugene gets its municipal water supply from the magnificent McKenzie River, which has its headwaters in the Willamette National Forest. The town of Cottage Grove gets its municipal water supply from Brice Creek, in the northern portion of the

Umpqua National Forest. Outdoor enthusiasts including hikers, rafters, kayakers, bikers, hunters, anglers, mushroom pickers and non-timber product gatherers heavily use this region.

Threats

The greatest threat to this keystone forest is ongoing logging of ancient forest on public lands administered by the BLM and the Forest Service. Over the next 20 years, 1.1 million acres of late successional and old-growth forest are slated for logging.

Efforts to Increase Protected Areas

The Lewis and Clark Mount Hood Wilderness proposal introduced by Senator Ron Wyden (D-OR) would add 177,000 acres of wilderness and 48 miles of Wild and Scenic River designation around Mount Hood and in the Columbia Gorge. A small percentage of

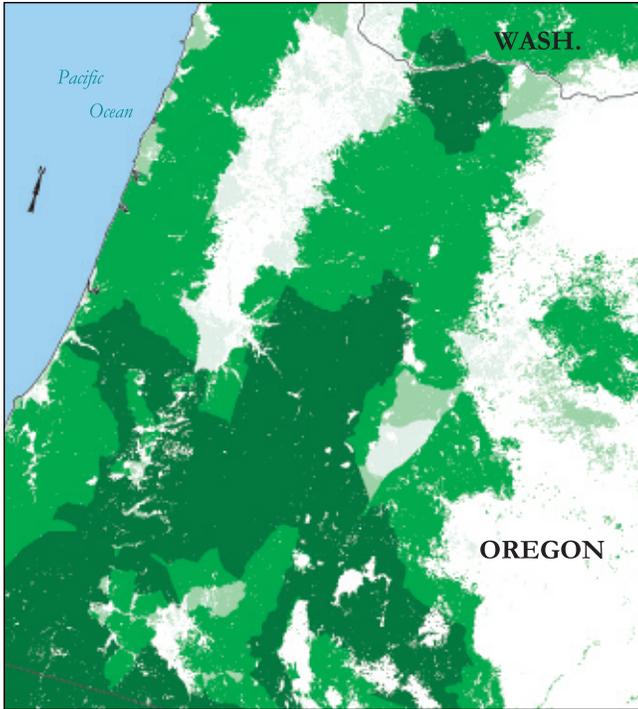
Mount Hood National Forest, Oregon.



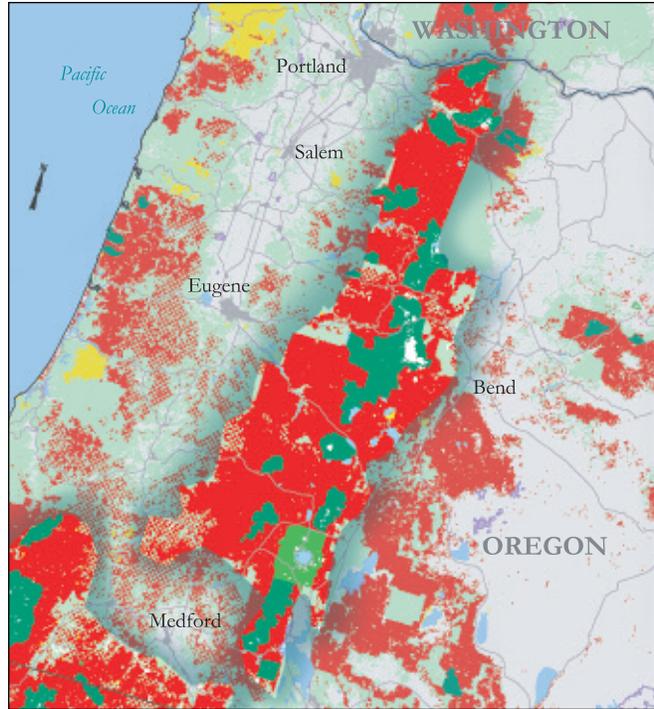
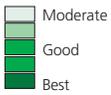
Forested BLM Lands (non-wilderness)	189,291
Forested National Forest Lands (non-wilderness)	3,814,425
Forested National Wildlife Refuge Lands (non-wilderness)	793
Forested National Park Lands (non-wilderness)*	155,929
Forested Wilderness	897,240
Forested miscellaneous public and private preserves	10,664
Privately owned, unprotected forest lands	629,120
Total Forested Lands	5,697,462

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© CRAIG TUTTLE/CORBIS



Forest Quality



Forest Ownership

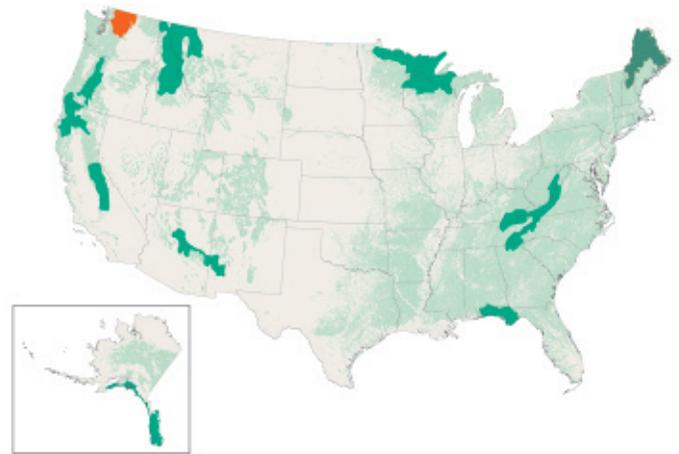
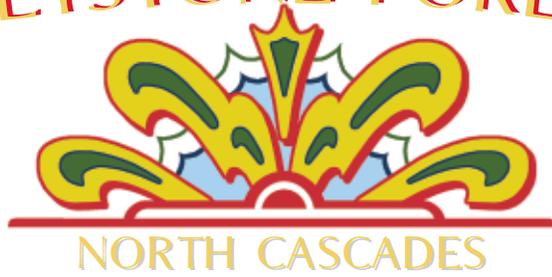


this legislation pertains to an eastern portion outside of this keystone forest.

There is a growing campaign to convert much of the northern portion of Mount Hood National Forest to a newly formed Mount Hood National Park. Though the exact boundaries would be determined by a national park feasibility study, probable boundaries could include the Oregon side of the Columbia Gorge, Mount Hood and the backcountry around the mountain, extending south to the Clackamas River. In addition, the campaign is expected to introduce wilderness legislation that includes approximately one million acres of roadless areas in national forest and BLM land.

*Written by Josh Laughlin
Cascadia Wildlands Project
www.cascwild.org*

KEYSTONE FOREST



Physical Description

The North Cascades Keystone Forest, ranging from Interstate 90 in Washington north to the Canadian border, is among the wildest places in America. During the months when the North Cascades Highway (SR 20) is under snow, the area features the largest contiguous expanse of roadless land left in the lower 48 states. This keystone forest stretches between the Puget lowland and the Cascade Mountains leeward forest ecoregions.

Forests of Douglas fir, Western hemlock and Western red cedar domi-

nate the Western slopes. The Eastern slopes vary from Douglas fir to Ponderosa pine to lodgepole pine. The valleys start as low as almost sea level and are often separated by high and rugged ridges that reach to stunning peaks, the highest of which is volcanic Mount Baker at more than 10,000 feet. In this remote expanse, low populations of grizzly bear, wolverine, lynx and cougar are still found and the occasional wolf. The usual list of Northwest forest-dependent species also live here, from the Northern spotted owl to Pacific giant salamander,

pine marten and a few lonely Pacific fisher. Runs of Pacific salmon, steelhead and bull trout vary in health.

The North Cascades is heavily used for recreation by both the urban population around Seattle and the surrounding rural communities. Hunting, fishing, hiking, birding, rafting, rock/mountain climbing, backcountry skiing and horsepacking are all common.

Threats

The North Cascades is presently one of the best protected ecosystems in the country, but Bush administration policies related to the logging of dry forests as well as the ongoing rollbacks of Northwest Forest Plan provisions, pose serious threats. There are also significant problems with overgrazing in some areas, excessive recreational use and growing impacts associated with population growth in valleys like the

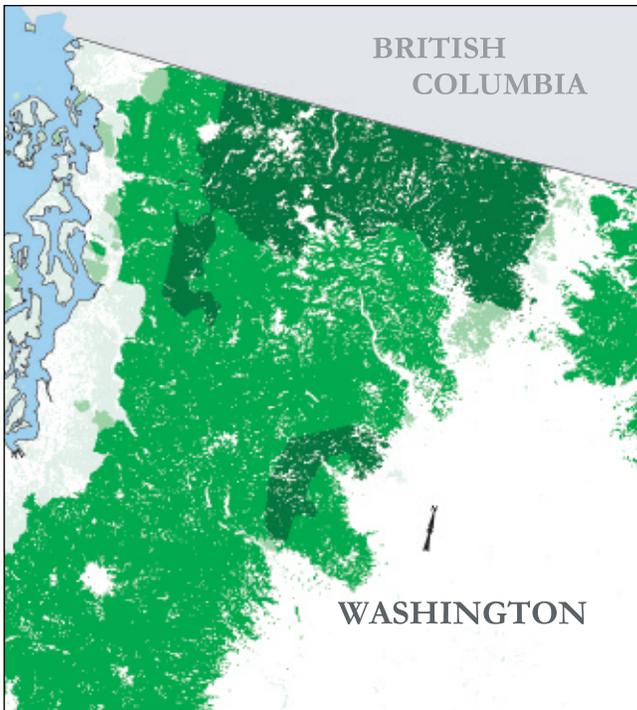
Mount Shuksan is reflected in Picture Lake in the North Cascades National Park, Washington.



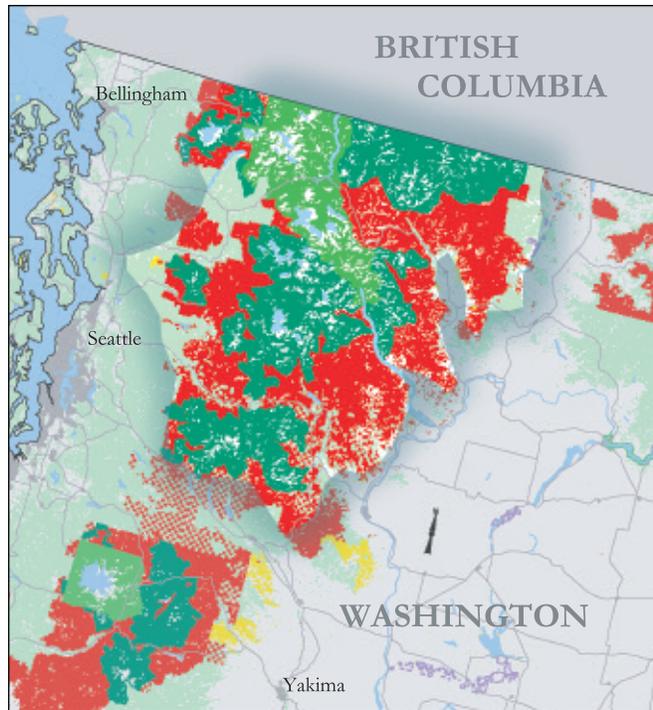
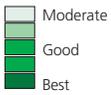
Forested BLM Lands (non-wilderness)	6,773
Forested National Forest Lands (non-wilderness)	2,082,560
Forested National Wildlife Refuge Lands (non-wilderness)	576
Forested National Park Lands (non-wilderness)*	484,360
Forested Wilderness	1,586,887
Forested miscellaneous public and private preserves	6,341
Privately owned, unprotected forest lands	795,786
Total Forested Lands	4,963,283

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.

© QT LUONG/TERRA GALLERIA PHOTOGRAPHY



Forest Quality



Forest Ownership



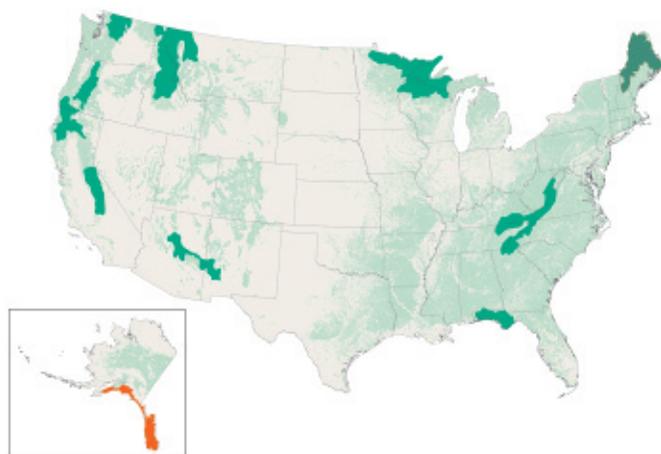
Methow and Skagit.

Efforts to Increase Protected Areas

The Wild Sky Wilderness Act would permanently protect more than 100,000 acres as a Wild Sky Wilderness Area of wildland in the Mount Baker-Snoqualmie National Forest. This act has passed the Senate twice, but is stalled in the House. Citizen proposals also exist for additional wilderness around Mount Baker and other areas.

*Written by Mitch Friedman
Northwest Ecosystem Alliance
www.ecosystem.org*

KEYSTONE FOREST



Physical Description

The northern limit of North America's coastal temperate rainforest is in Alaska. This is the rarest forest type on Earth with 38 percent of this ancient forest in Alaska. This keystone forest is part of the larger Northern Pacific Coastal forest ecoregion. Dominant tree species are Western hemlock and Sitka spruce, with some Alaska yellow cedar in the southern portion. Watersheds consist of small to very large islands numbering in the thousands, and relatively short mainland rivers with headwaters in a glaciated

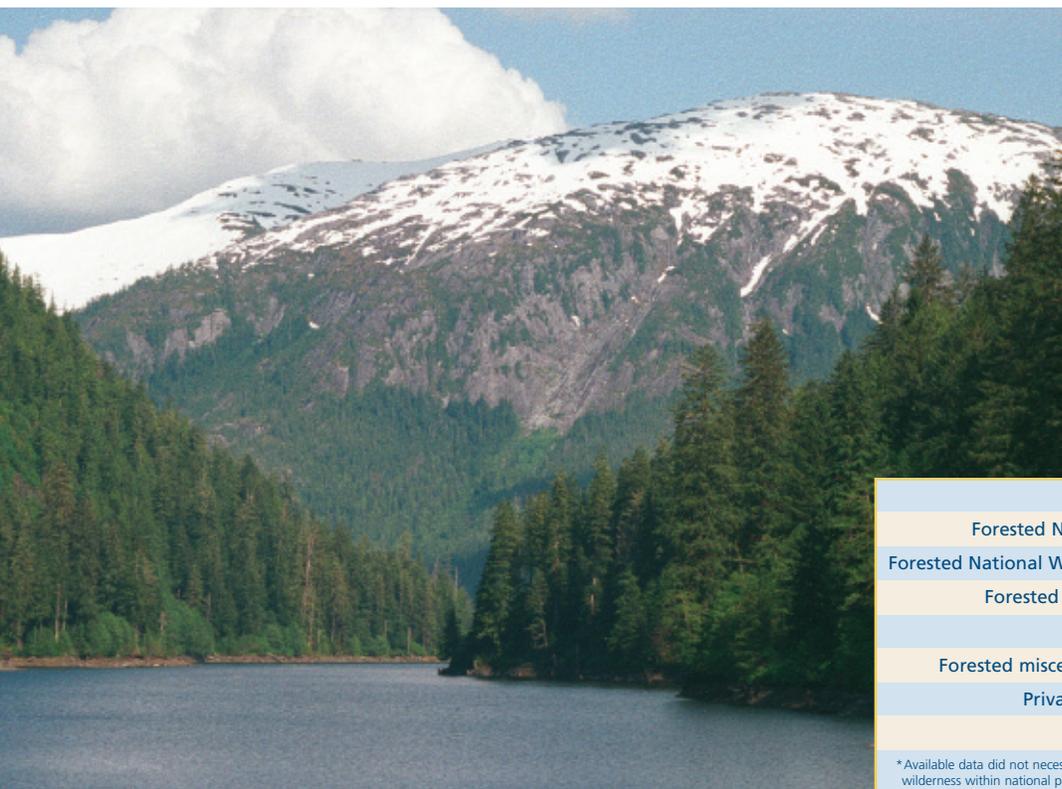
coast range hundreds of miles long that has peaks typically 5,000 to 10,000 feet in elevation, reaching to 18,000 feet. Some islands are also very mountainous and have alpine glaciers. The preponderance of land in the keystone forest is federal, nearly all of it in the Tongass and Chugach National Forests and Glacier Bay National Park. The state of Alaska, the University of Alaska, the Alaska Mental Health Trust, and a number of for-profit Native corporations have other significant landholdings.

Important wildlife includes five

species of salmon, brown and black bears, wolves, mountain goats, moose, deer and bald eagles. The area is also home to the imperiled Alexander Archipelago wolf and Queen Charlotte goshawk. There are several endemic animal populations as a result of the island geography. Many scientists believe the viability of several species in the southern part of the keystone forest is not assured beyond 100 years under current forest management practices.

Biological hotspots are estuaries and their surrounding forest, salmon streams and coarse-canopy forest (old-growth stands with large trees that have well-developed crowns and break snowfall well). Coarse-canopy forest was always rare here and now is being heavily targeted by a half-century of industrial scale logging (an estimated two-thirds has been lost). Much of the land area is non-forest (89 percent of

Tongass National Forest, Alaska.



© GREENPEACE/STEPHANIE HILLMAN

Forested BLM Lands (non-wilderness)	972,067
Forested National Forest Lands (non-wilderness)	7,275,222
Forested National Wildlife Refuge Lands (non-wilderness)	23,875
Forested National Park Lands (non-wilderness)*	706,063
Forested Wilderness	2,989,094
Forested miscellaneous public and private preserves	0
Privately owned, unprotected forest lands	2,323,314
Total Forested Lands	14,289,635

*Available data did not necessarily distinguish wilderness from non-wilderness within national parks, so some wilderness within national parks may be included within this statistic.



Forest Quality

- Remaining coastal temperate rainforest
- Other forested areas



Forest Ownership

- Forested BLM and national forest lands
- Forested national parks
- Forested wilderness areas
- Forested national wildlife refuges
- Misc. forested public lands and private preserves
- Privately owned forests
- Wilderness area boundaries
- National park boundaries
- National wildlife refuge boundaries
- Urban areas
- Highways

the Chugach National Forest and 54 percent of the Tongass National Forest), and much of the forested area is scrub forest. Accordingly, old-growth habitat is naturally highly fragmented, and in many places logging has dramatically increased fragmentation.

Native cultures have remained strong in this keystone forest. Sport and subsistence hunting, fishing and gathering are highly important activities in the regional culture (both native and non-native). Commercial fishing for salmon, ground fish and crab is a mainstay of the region. Tourism is also important, ranging from independent travelers who come to hike or kayak to cruise ships.

Threats

The primary threat in the southern portion of the forest is logging and associated road-building. Logging in the region is marginally economic, creating pressure to target valuable, accessible

low elevation coarse-canopy forest stands, often in roadless areas. Active plans by the state of Alaska to build a region-wide electrical intertie and to replace the existing ferry system with many short ferry hops connected by highways also present significant threats to the forest.

At present, there is no significant timber industry in the northern region. Proposed road access to the Bering coal-field presents one threat. Much of the shoreline/forest interface was damaged by the 1989 *Exxon Valdez* oil spill, and wildlife populations are stressed.

Efforts to Increase Protected Areas

Pending legislation: the Alaska Rainforest Conservation Act (H.R. 979) introduced by Rep. Rosa DeLauro (D-CT) with more than 100 cosponsors would permanently protect the remaining wildlands of the Tongass and Chugach National Forests to provide for hunting, fishing, recreation,

tourism and ecological integrity. Another area for protection includes the expansion of Kenai Fjords National Park to include portions of the Chugach National Forest on Prince William Sound.

Written by Greenpeace
www.greenpeaceusa.org