

Endangered Species Acts Must Protect Plants

Plant Conservation Fact Sheet

SUMMARY

Our planet is experiencing species extinction rates unprecedented in our history (National Academy of Sciences, 1995). Scientific work over recent decades has given us a good understanding of the risks these extinctions pose for the planet and its human inhabitants. Science has also provided us with an understanding of the basic requirements for effective conservation of biological diversity. California is one of the most biologically diverse regions on earth and our conservation laws are among the most advanced. However, our California Endangered Species Act is being misinterpreted and misused to withhold protection from many of our rarest plant species. This problem must be remedied.

California's Biological Diversity is a Global Conservation Priority

- California is recognized worldwide as an uniquely biologically rich and diverse region.

California is home to 25% of the plant species in the continental United States (California Department of Fish and Game, 1997). California has almost 6000 native plant species, more than 2000 of which are found nowhere else on earth (California Native Plant Society, 2001).

- Our plants are at risk.

CNPS has identified over 1,500 plants that are imperiled, nearly 25% of our native flora (California Native Plant Society, 2001). According to the Association for Biological Diversity, California has more imperiled species than any state except Hawaii (Stein et al., 2000). California also has more Federally listed plants, than any state except Hawaii (U.S. Fish and Wildlife Service, 2001).

- California is a biodiversity conservation hotspot.

Because of this, numerous studies have identified California as an urgent priority for habitat and species conservation efforts (e.g. Stein et al., 2000; Noss and Peters, 1995; Olson and Dinerstein, 1998; Wilson and Perlman, 2001).

Plants are the Foundation of Ecosystems and of Life

- Plants are essential to life on this planet.

Through photosynthesis, plants convert water into the oxygen we breath. Plants convert atmospheric nitrogen into protein – one of the basic building blocks of life (Brady and Weil, 1999). Through photosynthesis, plants convert the sun's energy into forms that are usable by other living things. Without photosynthesis, almost all life on this planet would cease to exist (Raven et al., 1981).

- Native plants are essential to wildlife.

Native plants and wildlife have coevolved over the millennia. Plants meet the exact food and shelter needs of native wildlife through mutual adaptation. Wildlife-plant relationships are often extremely specialized. For example, the Clark's Nutcracker, a bird native to the Sierra Nevada, cannot survive or reproduce without nutrition from the seeds of a specific plant: the native Whitebark Pine. For its part, the nutcracker helps the pine reproduce by spreading seeds (Lanner, 1996). Neither native species can survive without the other. Many butterflies, such as the imperiled Bay Checkerspot, feed on, lay eggs in, and pollinate only specific native plants (U.S. Fish and Wildlife Service, 1987). This type of obligate interrelationship is why land managers, such as the California Department of Fish and Game and the U.S. Forest Service, use the composition and health of plant communities to evaluate the quality of wildlife habitat through the Wildlife-Habitat Relationships (WHR) system (Mayer and Laudenslayer, 1988).

Native Plants Perform Valuable Ecosystem Services

➤ Native plants are essential to ecosystem function.

Plants build soil. Soil stores water and mediates floods (Daily et al., 1997) and produces the foods we eat and the commodities we use (Brady and Weil, 1999). Plants also clean water by absorbing contaminants, particularly in streams and other wetlands (Ewel, 1997). Plants help ecosystems reduce flooding by facilitating water infiltration into soil, reducing runoff, and through absorbing and transpiring water (Wilson and Perlman, 2001). Plant roots, shoots, and foliage also reduce erosion by holding soil in place and softening raindrop impact (Myers, 1997).

➤ Native plants produce valuable commodities.

Timber, food, fibers, medicines, and numerous other products are made from plants. Twenty-five percent of prescriptions written in the United States are for medicines originally derived from plants. The life-saving cancer drug taxol was developed from the Pacific Yew, a native of moist stream canyons in our ancient forests (San Francisco Chronicle, 5/8/95). Insects and birds that depend on native plants for habitat and survival pollinate billions of dollars of California's crops each year (Abramovitz, 1997).

Native plants are reservoirs of genes that may be useful for the production of medicines and other commodities, for the maintenance of food supplies, or for ecosystem survival. As the United Nations Environmental Programme has stated in its 1995 "Global Biodiversity Assessment" (UNEP, 1995), based on contributions by more than 1500 scientists:

"...it is clear that the loss of biodiversity has serious economic and social costs. The genes, species, ecosystems and human knowledge that are being lost represent a living library of options available for adapting to local and global change."

➤ Native plants provide aesthetic and recreational benefits.

Finally, native plants provide invaluable aesthetic and recreational benefits to the people of California. Plants are the most visible elements of California ecosystems. Up and down our coast, valleys, and mountains, native wildflowers and trees delight the eye and perfume the air throughout the year. California's multi-billion dollar wildland recreation industry depends on these plants. According to the U.S. Fish and Wildlife Service, outdoor recreation (wildlife watching, hunting and fishing) generated more than \$5.6 billion in economic activity in California in 1996. Wildlife watching alone generated \$2 billion and supported almost 48,000 jobs in our state (U.S. Fish and Wildlife Service, 1996).

Ecosystems Need Native Plants

Native plants are specifically adapted to function optimally in concert with their native soils, wildlife and climate. Infestation by non-native plants tends to decrease the ability of ecosystems to provide the valuable, high quality services we depend upon.

➤ Native wildlife need native plants.

Wildlife habitat quality is degraded by non-native plants. As noted above, many native wildlife depend on specific native plants for survival. Numerous studies demonstrate reduced numbers and/or diversity in birds, reptiles, small mammals, and insects in areas infested with non-native plant species (Huenneke, 1996). For this reason, the Audubon Society replaces non-native plants with natives to restore habitat for imperiled birds such as our state bird, the California Quail (San Francisco Chronicle, 12/27/01).

➤ Native plants protect ecosystem integrity.

The roots of many noxious weeds such as tamarisk, star-thistle, and knapweed are known to penetrate deeper into the soil than natives resulting in depletion of water tables and increased competition for limited resources such as water. Other common non-natives, particularly grasses, have weaker root systems than natives, substantially reducing a plant community's ability to control soil erosion. For example, sediment yield can be almost 200 percent higher for hillsides dominated by Spotted Knapweed than for native bunch grass vegetation types, causing costly damage to water supplies and reservoirs (Lacey, 1989). Conversion of native chaparral to non-native grassland has also been found to increase risk of slope failure and erosion (Barro and Conard, 1987).

Rare Species Conservation is Central to Biological Diversity Conservation

"...of all the global problems that confront us, [extinction] is... moving the most rapidly... will have the most serious consequences; and unlike other global ecological problems, it is completely irreversible." Peter Raven, 1993.

- Rare species are indicators of endangered ecosystems.

Rare species are rare because the ecosystems they inhabit are unusual or degraded. Rare species, therefore, are not isolated entities, but indicators of larger problems. Rare species help us determine which habitats require special conservation attention if California's native biological diversity is to survive.

- Rare species may perform valuable functions.

Rare species and their habitats must also be conserved because more often than not, we do not know what critical functions they may perform, now or in the future. They may provide essential ecosystem services. They may be reservoirs of genetic diversity that will maintain sustainable food and commodity production. They may be required for other species or ecosystems to survive climate change or disturbances such as flood, fire or disease. This is why a U.S. Forest Service fact sheet on biological diversity states:

"The extinction of even a single plant species may result in the disappearance of up to 30 other species of plants and wildlife." (USDA Forest Service, 1993).

In summary, rare species must be conserved so that California ecosystems can continue to provide the ecosystem services that drive our economy and enhance our quality of life.

CONCLUSION

Endangered Species Acts Protect Ecosystems and Habitats, Not Just Species

Plainly, our elected officials understand these concepts because both the California and Federal Endangered Species Acts explicitly recognize that we must conserve intact, functioning habitats and ecosystems if we are to conserve our natural heritage.

The Federal Endangered Species Act states:

"The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species...", (16 USC 1531 *et seq.*, Sec. 2(b), emphasis added).

The California Endangered Species Act states in its findings section:

"These species of fish, wildlife, and plants are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern." (California Fish and Game Code. Sec. 2051(c), emphasis added).

Science tells us that we must conserve plants in order to successfully conserve ecosystems and biological diversity. As the National Academy of Science put it in its critique of the Federal Endangered Species Act, which provides weaker protections for plants than animals,

"There is no scientific reason (other than lack of knowledge) to exclude nonvertebrate animals and plants from coverage under the ESA." (National Academy of Science, 1995)

The California Endangered Species Act does cover plants but has been widely misread to cast this protection into doubt. This confusion has led to inconsistent implementation of the law and to the needless and unmitigated loss of many populations of California's listed plants. This problem must be corrected.

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