

# Environmental protection program

[Environment](#), [Ecology](#)



The collective action of humans - developing and paving over the landscape, clear-cutting forests, polluting rivers and streams, altering the atmosphere's protective ozone layer, and populating nearly every place imaginable - are bringing an end to the lives of creatures across the Earth. Extinction of biological species is not necessarily a phenomenon initiated by human activity, some argue. Although the specific role of extinction in the process of evolution is still being researched and debated, it is generally accepted that the demise of any biological species is inevitable.

Opponents of special efforts to protect endangered species invariably point this out. They also suggest that the role of homo sapiens in causing extinction should not be distinguished from that of any other species. This position, most often espoused by individuals whose other views are curiously much more anthropocentric, is contrary to some well established facts.

Unlike other creatures that have inhabited the Earth, human beings are the first to possess the technological ability to cause wholesale extermination of species, genera or even entire families of living creatures.

This process is accelerating. Wildlife management efforts initiated during this century have been unsuccessful in stemming the tide. Most public attention given to endangered species has focused on mammals, birds, and a few varieties of trees. Ecologists recognize a far greater threat to the much larger number of species of reptiles, fish, invertebrates, and plants that are being wiped out by human activity. In the past few decades, vast areas in several regions of the world have been cleared to make room for urban development or for food production.

Modern agriculture techniques and industries' need for raw material have contributed to the epidemic of extinction. During the last few centuries, growth in the human population and intensification of our use of resources has greatly increased the rate of species extinction. Today, this rate is at least 1, 000 times higher than it was when the genus Homo made its appearance about 2 million years ago. According to the best estimates, an average of 200 species vanishes from the Earth every day.

By the year 2025, an estimated 20 percent of Earth's species may have been pushed to extinction - a loss of species unmatched since the end of the Mesozoic 65 million years ago. For human beings, the consequences of this extensive wave of extinction's will be severe, whether they are viewed from a moral, aesthetic, scientific, or economic perspective. Scientists fear that the vitality of our ecology may be seriously threatened by the reduction of biological diversity resulting from the lost genetic resource contained in the extinct species.

They note that the ability of species to evolve and adapt to environmental change depends on the existence of a vast pool of genetic material. This problem joins the issue of endangered species with that of wilderness preservation. Unfortunately, the need to set aside vast undeveloped areas to prevent wholesale extinction is more acute in the poorer, more crowded regions of the world where people are pressured by both their own basic needs and the demand of the industrialized world for their resources.

The concept of biodiversity helps capture the magnitude of the problem. Biodiversity is the variety of, and interaction among, living organisms and

the ecological complexes that they occur in, from the smallest habitat to the Earth as a whole. The concept also includes the genetic variability within these species, the raw material of both evolutionary adaptation and selective breeding by humans. In terms of biodiversity, extinction is more than the loss of individual species, it is the degradation of the ecological complexes that support all life on this planet.

The set of plant, animal, fungus and microorganism species that occur together at a particular place make possible the functioning of an ecosystem at that place. Undisturbed ecosystems, with their natural level of biodiversity - regulate the flow of energy and the cycling of nutrients, which all life depends on. The ongoing elimination of a sizable portion of the Earth's biota is probably the clearest sign that the manner in which we use the natural environment is not sustainable. The intensity of our exploitation of natural resources is simply too great.

In the past 40 years, human beings have wasted over a fifth of the Earth's topsoil, destroyed more than half of its forests, polluted most fresh and onshore marine waters, and profoundly changed the characteristics of the atmosphere. It is easy to put much of the blame on population growth. The human population has more than doubled over the past 40 years to reach the present level of more than 5.5 billion. Each new person puts an added burden on the natural environment. Yet if we are to understand the roots of the problem and work towards real solutions, we need to look at other factors besides population growth.

As living organisms, we must utilize the natural environment to satisfy our basic needs. The manner in which we do this, however, is as variable as humanculture. The problem is that present social, economic, and political structures encourage us to maximize our use of natural resources rather than use them wisely. In today's world, economic resources are highly concentrated in industrialized countries, where most of the world's goods are consumed by a minority of the global population.

Seventy-seven percent of the people in the world - most of whom live in less-developed nations - have only about 15 percent of the world's wealth, consume only 10 to 15 percent of the world's natural resources, and generate about 10 to 15 percent of the world's pollution. This global inequality is one of the major factors contributing to overuse of resources and destruction of natural habitats.

At present, our ignorance of biodiversity is telling: scientists believe that the total number of species on Earth may be about 10 million, although only 1.1 million have been named and classified. Such knowledge is of great importance in itself, and of fundamental importance to achieving sustainable productivity. But it is only one of many prerequisites; another is a stable human population. Unfortunately - and only if we sustain our attention to family planning around the world - two to three times the current number of people may be alive when the human population levels out. At that point, the intelligent use of organisms and other natural resources will be absolutely essential for future stability.

A stable human population, however, will not in itself allow us to attain a stable world. We must also address much more effectively the problems of poverty and lack of social justice throughout the world. This must include pursuing sustainable agricultural development in a way that guarantees more people access to the land they must have to meet their own needs. The role of women must also be enhanced throughout the world, in relation to health and family planning, literacy and school involvement, and participation in the work force.

Another problem to confront is overconsumption of the world's resources by people in industrialized countries. Plans to preserve biodiversity and utilize it sustainably will fail as long as the global community continues to promote growth and consumption rather than reduce them. In addition, it is important to augment the number of educators, scientists, and engineers who live in developing countries, only about one in twenty of the world's scientists and engineers live there.

Without technical knowledge and expertise, the chances for most less-developed nations to achieve sustainable productivity are poor. All nations must be given the opportunity to explore multiple paths, consistent with their own social values, for making biodiversity an indispensable ingredient of socioeconomic, cultural, and scientific development. Without the achievement of a stable global population and the implementation of social justice, it simply will not be possible to learn about, manage, preserve, and benefit from what is left of the world's biodiversity.

Understanding the connections between biodiversity, human institutions, and our long-term survival is the first step in learning to manage the biological resources of the planet Earth, our common home, for our mutual benefit. The sixth extinction is not inevitable. If humans are the cause, they can also be the solution. Conservation law in this country has taken a new turn, and in many ways California is leading the charge. The next decade will be an exciting and critical time for this state and the nation.

The future of our natural resources and of our quality of life may well depend upon the choices and commitments we make over the next few years. If you travel the length or breadth of the state of California, you experience its diversity as a progression of distinct environments, each with characteristic plant species and climatic conditions. To highlight such contrasts, scientists have divided the state into large bioregions, each of which encompasses environments with broadly similar characteristics. A bioregion is itself a mosaic of unique aquatic and terrestrial environments-marshes, grasslands, woodlands, forests.

California is composed of 11 major biogeographic areas, or bioregions. The great diversity of habitats within the state has allowed California to serve as a final refuge for species once dispersed throughout the West. The isolation provided by restricted habitats has allowed them to act not only as refuges, but also as centers of evolution for new species. Hence, California has a remarkably high degree of endemism - of species found nowhere else - in much the same way that an island often has endemic species. The two most

important arbiters of California's natural landscapes are its Mediterranean climate and its varied topography.

These factors are interconnected: landforms modify the climate, producing local variations in temperature and precipitation, and climate determines the nature and rate of erosion and soil deposition. Over eons, these and other factors have interacted to produce an amazing diversity of both landscapes and species. More than a third of the plants native to California are endemic, either evolving here in response to the continual opening up of new ecological niches, or finding refuge here after geologic change had altered their homelands. In California, population growth is obviously a direct cause of spreading urbanization.

New housing developments and freeways overwhelm woods, meadows, and chaparral, destroying unique habitats full of evolutionary novelties, placing many native plant and wildlife species in imminent danger of extinction. It is tempting to blame our problems on overpopulation. The California that once supported 300, 000 native Americans is now teeming with about 31. 5 million inhabitants-and their automobiles. It may be that the state's environment cannot support this many people, but we also should remember that incredible environmental damage had already been done when the state's human population numbered 1 million or fewer.

It may be more appropriate to look at the nature of our economic system, a system oriented toward and dependent upon continuous growth, and one that operates on the fixed assumptions that there are potentially unlimited resources at one end of our economic pipeline and, at the other, a



bottomless sink for disposal of wastes. Of course, there is neither. The first inhabitants of California lived for centuries within the limits of their environment, and the Spanish and Mexican economy was oriented more toward stability than growth.

Unfortunately, the "get-rich-quick" mentality of the Gold Rush pioneers who followed them continues to play a role in California even now. The view of the natural world as a place to live, and therefore to care for, has not held its own against the view of nature as something to exploit. We have reached our present dilemma: Now we must balance the need to protect and maintain what is left of California's once renowned biodiversity against the need to care for the well-being of its human population. Yet protecting nature is no longer merely an option; the survival of humanity depends on the survival of our cohabitants on Earth.