


The Ecological Society of America

2010 Massachusetts Avenue, NW
Suite 400
Washington, D.C. 20036
(202) 833-8773
Fax (202) 833-8775

25 September 1995

To: Senators and Representatives Concerned about Preservation of Biological Diversity

From: Gordon H. Orians, President 
The Ecological Society of America

Subject: **Scientific Basis of Species Preservation**

Throughout the world, species are being driven to and toward extinction by human activity at a rate unprecedented in the history of life on the Earth. This fact has stimulated a spirited debate in the United States on the causes of extinctions, the economic significance of extinctions, how much to invest in efforts to prevent extinctions, and the ethics of presiding over extinctions that could be prevented. By passing the Endangered Species Act of 1973, Congress affirmed that the best interests of the American public are served by investing societal resources to prevent the extinction of species. This affirmation was based on ethical, economic, and scientific considerations. The ethical imperative, of long standing in Western societies, is that humanity has a responsibility as a careful steward of the Earth, especially of the other species that share the planet with us. The greatly enhanced ability of people to cause massive extinctions of species makes this ethical imperative more vital than at any previous time in human history. Many people in the current political debate are calling for a return to the "traditional values" that have sustained our society. One of the traditional values that is suffering serious erosion is that of stewardship of the Earth.

The economic motivation of the Endangered Species Act is that species provide us with novel molecules and biological information that are used to develop agricultural products, medicines, drugs, fabrics, building materials, and other products of direct use to people. Species also provide essential ecological services to humanity by maintaining soil fertility, cleansing water and air, controlling erosion, regulating climate, and pollinating crops. Species also serve as the basis of extensive recreational activities that contribute immensely to the emotional and spiritual quality of human life. Some of these services are irreplaceable; others can be substituted by human efforts, but at considerable cost.

A major scientific motivation for passage of the Endangered Species Act was the increasing recognition that current rates of extinction are unprecedented and are primarily the result of human activities. Scientific information also showed that habitat alteration and destruction are the primary causes of increasing rates of extinction. Overexploitation and the massive trade in pets and animal parts are also contributing to endangerments and extinctions. These scientific findings, by demonstrating that human activities were the primary causes of driving species to

extinction, also showed that human activities could serve to reverse declines of species populations and to prevent extinctions.

Current debates over the reauthorization of the Endangered Species Act really focus on ethical and economic issues. The ethical debate centers on the seriousness of our stewardship responsibilities. The ethical imperative of stewardship is, like all other ethical imperatives, not absolute, but that does not decrease its importance. "Thou shalt not kill" is a strong ethical imperative, but most societies have supported taking of human life under specific restrictive conditions. Nonetheless, nobody supports wanton killing, nor would anyone wish to discard the imperative simply because exceptions are allowed.

"Thou shall not cause species to become extinct," the implied ethical imperative of the Endangered Species Act, underlies the efforts undertaken by American society to prevent the extinction of species. Some participants in the current debate believe that this ethical imperative should be replaced with the ethical imperative "Thou shall prevent species from becoming extinct only when it does not interfere with other objectives." Adoption of this ethical stance would result in further increases in the rate of species extinctions in the United States and elsewhere. Such ethical issues cannot, of course, be resolved by scientific data or arguments. The role of science is to help design appropriate actions in support of society's ethical imperatives that guide policy decisions.

Many polls show that the American people wish to continue their stewardship responsibilities and to benefit from the many goods and services provided by living in a species-rich world. The environmental sciences can help make the implementation of provisions of the current and future Endangered Species Act more effective and efficient by clearly identifying the causes and threats to the survival of species and populations of species, by estimating the economic consequences of loss of species, by analyzing the likely outcomes of implementing various policy options to prevent extinctions, and by estimating the effort needed to implement these options.

Many of these scientific issues are thoroughly analyzed in recent reports of a congressionally mandated committee of the National Academy of Sciences/National Research Council (NRC) and a special committee of the Ecological Society of America. These reports both agree that the provisions and procedures written into the Endangered Species Act are based on sound science and are appropriate for achieving the goals of the Act. These reports endorse the importance of protecting both species and the ecosystems upon which they depend, the value of protecting distinct population segments of species, the criteria for listing species under the Act, and the need for protection on both public and private land. Both reports also point out the value of a more proactive policy that identifies future threats and initiates actions before species are critically endangered. By the time a species is truly endangered, options are more limited and costs of restoring the species to a viable state are more expensive than they would be if restoration had been initiated sooner. In the arena of species preservation, as in the arena of public health, an ounce of prevention is worth a pound of cure.

Scientific data show that any federal legislation capable of functioning as the basis upon which the biological resources of the United States can be preserved and passed along in undiminished form to future generations must contain the following provisions:

1. A commitment to preventing extinction and promotion of recovery of populations as the goals of the legislation.

2. Recognition that sufficient amounts of critical habitat must be provided so that species can survive in nature, and that both public and private lands are essential components of viable preservation plans for many species.
3. Recognition that habitat destruction directly "harms" species as much as, and in many cases more than, shooting or killing individuals does.
4. Recognition that "listing" is a scientific decision and that the only appropriate listing criteria are scientific ones.
5. Recognition that captive breeding serves primarily as a holding operation that maintains species until the causes of their endangerment have been removed or reduced so that individuals can be reintroduced into the wild.
6. Recognition that delays in providing adequate protection for threatened and endangered species increase the chance that the species will become extinct and increase the costs of recovery.

Weakening of any of these provisions would guarantee accelerated extinctions of species within the United States. To assert or pretend that rates of extinction can be reduced by actions undertaken under alternative policy guidelines is to ignore all relevant scientific information. If Congress is serious in its efforts to base federal regulatory activities on sound science, any revisions to the Endangered Species Act must retain or incorporate the above provisions.

This is not to claim that the Endangered Species Act has been completely successful or that implementation problems have not existed. Most of these difficulties, however, have been due to information gaps, failure to utilize the full range of options available under the Act, and allocation of insufficient resources to implement the requirements of the Act, not to deficiencies in the Act itself. Indeed, in recent years, several imaginative new approaches to species preservation have been initiated, all of which employ procedures appropriate under current provisions of the Endangered Species Act. These initiatives need to be encouraged so that stewardship becomes a more cooperative venture among a diverse array of public and private entities. By these means all members of American society may share appropriately in the costs and benefits of preservation of the biological heritage of the United States.