

How to Improve the Endangered Species Act

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The United States' Endangered Species Act (ESA) is based on societal values, not science. For practical as well as political reasons, the ESA should remain an active, Federal statute. However, many modifications can be made in the language of the ESA to greatly improve its implementation and enforcement. Some proposed changes are minor; others will have major impact on the law.

My intentions for suggesting these changes are:

- To make the ESA more reasonable, effective and accepted (by the regulated public).
- To make recovery efforts and the money spent actually benefit the listed species.

The second point is very important. Consider the Pacific salmon populations in the Columbia River basin (258,000 miles square). The basin includes most of the states of Washington, Oregon and Idaho plus smaller areas in Montana, Wyoming, Nevada and Canada. Since the first five salmon populations were listed under the ESA in 1991, over \$3.5 billion have been spent on recovery efforts by the Bonneville Power Administration alone. However, I cannot find any published reference to the benefits given to the five listed populations by this large amount of money. In other words, what have we bought for these populations by spending all this money?

The changes I suggest are in three categories:

- assumptions,
- science and
- regulation.

Under assumptions, I suggest modifying the definition of a species under the ESA and enhancing the recognized reasons for decline in species numbers. Under science, I suggest strengthening the scientific foundations for deciding critical species numbers and I recommend that recovery plans be active rather than

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passive. Under regulation, I suggest statutory guidance to reduce the amount of regulatory decisions which are arbitrary or capricious.

1 Assumptions

There are two badly flawed, basic assumptions of the ESA. The first is the definition of a “species”; the second is the cause of species population decline. Both assumptions are fundamental to the ESA and have major impact on every aspect of the law.

1.1 What is a species?

This is a question which appears to divide biologists. However, it is of greater importance to those individuals whose specialty is dependent upon identifying and naming new species, or those individuals working in a related subject area, such as genetics. From a non-scientific, societal perspective, we identify species based more on convenience to ourselves than on objective, measurable biological “facts”.

Consider domestic animals such as dogs, cats, horses, cows and chickens. We name differences in appearance (phenotype), genetics (genotype) and behavior (ethnology) as “breeds”, not as sub-species.

Our food plants are differentiated as “varieties”, not as sub-species. Furthermore, we deliberately manipulate plant genetics to produce “strains” with desirable characteristics (*e.g.*, drought or root-rot resistance.)

And, of course, all human beings are considered to belong to a single species despite being classified into distinct “races” by at least 92 different physical characteristics,

On the other hand, we readily accept the concept of sub-species to distinguish among observed or measured differences of game animals, non-game animals, wild plants and other non-domesticated species.

Among the most passionate advocates of the concept of sub-species are those academicians who specialize in the subjects of taxonomy (naming plants, animals, bacteria and other organisms), systematics (establishing the evolutionary relationships among different species) and population genetics (studying the genetic differences among individuals and assigning meaning to those differences). There are also agency staffers who perceive their professional future as directly dependent upon sub-speciation. In the scientific vernacular, this category of scientists or bureaucrats is called “splitters”; people who want to split species into smaller, identifiable units.

I, like many ecologists, comprise the other category of scientists: we are “lumpers”, scientists who want to lump the different varieties into the same species name. We subscribe to Ernst Mayr’s (1949) Biological Species Concept (BSC). This is the definition we were all taught in school: if two adults have the potential to breed and produce viable offspring, the breeding parents are of the same species. (The equivalent language describes plant species.)

The ESA has been defined and refined by “splitters”. The current concept of an “evolutionarily significant unit” (ESU) is the extreme representation of this concept. The ESU evolved from a concept called the “discrete vertebrate population segment” developed by the National Marine Fisheries Service and the Fish and Wildlife Service in 1994.

Splitting species into sub-groups based on local genetic differences is bad science for several reasons. For example, we have no proof that the observed genetic differences result in different survival rates for individuals. (We do know that genetic variability improves species survival rates, but that is at a different scale than the individual.) Also, populations at the fringes of a species’ geographic distribution must be genetically different from populations toward the center of the species’ range. The conditions are very different between the center and the edges; if this were not the case, the edges would be further away from the center. From the perspective of a species, populations on the distributional edge are expendable because they are very highly specialized and locally adapted.

My recommendation as an ecologist and biologist is that the ESA language be changed to apply only to named species. This means that local populations, management units of fish (called “stocks” by fisheries managers) and geographically-specific variants of plants and animals would not be considered to be species under the ESA. There is compelling scientific support for this change – particularly for anadromous salmon and many plant species.

1.2 Why Populations Decline

Within the existing ESA is the assumption that all species population declines are due to loss of habitats. Even when the term “habitat” is loosely defined, this has rarely been the case. Bald eagles and many other birds of prey (raptors) declined in numbers because of the thinning effects of the insecticide DDT on egg shells. Pacific salmon have been declining because of climatic and ocean conditions (over which we have no control whatsoever), decades of over-harvest, land use changes (agriculture and urbanization), hydroelectric dams which changed the river hydraulics and eliminated access to spawning or rearing habitats, hatcheries, and other natural and human factors. Almost 100 years ago, populations of Columbia River salmon were almost extirpated because of over-harvest. As we know from our lifetimes, the salmon populations recovered when fishing pressure lessened.

Habitat loss certainly has reduced the numbers of some species populations. Buffalo (bison) were once very numerous on the grass plains of the central United States. Conversion of short- and tall-grass prairies to agricultural fields, cities and towns, and interstate highways removed their historic grasslands habitats and constricted their distributional range. Profligate and unregulated hunting also took a tremendous toll on population numbers.

There are many causes of species population decline, and the ESA should recognize more than just habitat loss. Not changing the definition will very

likely lead to continued spending of large amounts of money, significant disruptions to everyone in the affected areas (not just commerce and industry) and yielding no identifiable or measurable benefits to the species on the list.

2 Science

The ESA requires the responsible agencies (currently the NMFS and FWS) to make three determinations:

1. When the population size of a species has so few potentially interbreeding individuals that it may become extinct.
2. What actions can actively produce an increase in the size of the population.
3. When a species has sufficient numbers to be self-sustaining and removed from the ESA list.

The first and third determinations have no measurable basis applicable to all species of plants and animals. And the second determination has too often been passive rather than active. The lack of science may well be the major reason so many ESA-related lawsuits are filed and end up in court.

The ESA language should reflect the lack of hard science, but direct the responsible agencies to develop administrative rules and procedures that document, support and justify their decisions based on the best available science.

Specifically, the agencies should be directed to prepare a comprehensive bibliography of relevant research and other data and use *all* the available data when making decisions. Unfortunately, this is not always done. The public should be encouraged to participate in the collection of the data and in the assessment of its relevance similar to public participation under the National Environmental Policy Act (NEPA). The specifics of public participation can be left to the agencies (since that is more of an administrative decision than a statutory one), but it should be a necessary element.

3 Regulation

There is high value in allowing the responsible agencies a great deal of flexibility in implementing the ESA. On the other hand, they need to be made more accountable to the public. This accountability takes two forms: ecologic/economic and responsiveness.

3.1 Ecologic and economic accountability

Too often the responsible agencies offer the image that the end justifies all means, regardless of cost or harm to the public. Another change in ESA language should be the requirement for a benefit-to-cost analysis for proposed

actions imposed on the regulated public. The economic impacts to small businesses, cities and private industry should be evaluated relative to the anticipated benefits of a proposed action. Again, the implementation details are administrative rather than statutory, and I acknowledge that benefits of natural resources (such as species) are neither objective nor easily established. But, we need to know the basis used for that valuation.

One example of where benefit:cost analysis could have made a significant difference are the “recovery” efforts for Pacific salmon populations. As I mentioned toward the beginning of this article, according to reports published by The Oregonian (Portland, Oregon), the Northwest Power Planning Council, and the Bonneville Power Administration, approximately \$3.5 billion has been spent on “salmon recovery” efforts over the past decade. (I have also heard estimates that range up to \$10 billion dollars over the same period.) It would be very useful to know how much documented “recovery” society has gained from that expenditure.

3.2 Regulatory responsiveness

While all Federal statutes mandate time limits for regulatory action, these are easily avoided by agency staff. Sometimes an application is deemed incomplete regardless of what is submitted, and the regulatory clock does not start until a completed application is accepted by the agency. In other cases, agency staff will delay making a tough decision and not make any decision at all. This quite often has significant impacts on the private sector; companies can be put out of business if permits are not issued or re-authorized in a timely manner.

Another lack of regulatory responsiveness is seen by the public when agency staff refuse to act or make a decision, and the unresponsive staffer has no accountability and suffers no consequences. Despite not doing the job he or she was hired to do – and is paid for doing – nothing is done for weeks or months on end. And there is no way for the regulated public to force action, so resentment and dislike builds against “bureaucrats” and “the government”. One way to possibly change these attitudes and behaviors is by making continuing education an integral part of the technical staffs’ career. Training in the specific scientific and management knowledge needed to efficiently and effectively fulfill a job description is not asking too much of anyone. And it is a very good use of public funds and public employee time.

These changes in the regulation of the ESA will affect how the Act is administered. In turn, more efficient administration saves taxpayer money and decreases the potential for litigation. Better staff knowledge and more objectively-applied science will yield more timely (and legally defensible) listing and delisting decisions.

The changes I have suggested are technically sound and will improve both the letter and the spirit of the ESA. They will provide society with a stronger, better working statute while reducing or eliminating many of the reasons for non-compliance or resistance on the part of the regulated public.