

The Economic Impacts of Critical Habitat Designation

by

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Designation of critical habitat can impose significant costs by raising the cost of development, reducing the amount of usable land and delaying completion of projects. These costs are borne by many groups including farmers, land owners, developers and, especially, consumers.

Among environmental regulations, the Endangered Species Act has the most potential to alarm landowners and developers who fear its ability to slow or thwart implementation of their plans. In general, the requirements that the Act places on property owners are absolute and there is no role for economic analysis or a balancing of competing social objectives. One exception, however, is in the designation of critical habitat—an issue of great concern in California since literally millions of acres in the state have been so designated.

When the government deems that a species is endangered or threatened, it is also supposed to designate critical habitat, which includes the areas presently occupied by the species and other areas that are “essential to the conservation of the species” and which may require special management or protection. As Table 1 indicates, there are a large number of endangered species listed by the U.S. Fish and Wildlife Service (USFWS) so that the critical habitat designation process has the potential to affect a significantly large number of landowners.

Section 4 of the Endangered Species Act requires economic analysis of the impacts of critical habitat designation and authorizes the Secretary of the Interior to take these impacts into account when deciding whether to exclude land from critical habitat. In a recent study conducted with David Zilberman, I developed a framework for measuring such impacts that draws on stylized facts about project development and land conversion, and compared this method to the one used currently by the USFWS.

The most obvious economic effects of critical habitat designation (CHD) are to increase the cost of development by making it more difficult to obtain necessary permits and to reduce the size of individual projects (e.g., number of single-family housing units, office spaces, etc.). However, the economic effects of CHD go well beyond these costs. The process of land development is complex

and conditioned by numerous factors. If land is set aside or if the scale of projects is reduced by CHD, there may well be market and regional effects from this designation. Other land cannot necessarily be brought into production to make up for losses due to designation, and even if it can, it may be in a sub-optimal location. CHD also delays the development process, which imposes additional costs on developers, consumers and others in the affected region.

The Numerous Impacts of Critical Habitat Designation

Costs of Completing a Section 7 Consultation. Section 7 of the Endangered Species Act requires federal agencies to consult with the USFWS to

Table 1. Type and Number of Endangered Animal and Plant Species in the U.S.

Mammals	65
Birds	78
Reptiles	14
Amphibians	12
Fishes	71
Clams	62
Snails	21
Insects	35
Arachnids	12
Crustaceans	18
Flowering Plants	570
Conifers and Cycads	2
Ferns and Allies	24
Lichens	2

Source: U.S. Fish and Wildlife Service as of January 24, 2003

insure that any activity funded, carried out or authorized will not likely jeopardize the continued existence of the species. This requirement increases the cost to complete the project and also imposes additional costs on federal agencies involved with the consultation. Sources of cost to the applicant include hiring outside consultants and attorneys to assist with the consultation process, and also the developer's own staff resources.

Another direct cost of Section 7 consultation is that the Service may require additional mitigation above that required by the action agency. In the case of California vernal pools, for example, the Service required that three acres of vernal pools be created for every one filled over and above the baseline. Adding the costs of the Section 7 consultation to the costs of mitigation, the direct, out-of-pocket cost of Section 7 consultation can be substantial, running to several thousand dollars per house in the case of some single-family housing projects.

Costs of Project Modification.

The Section 7 consultation process may also force project developers to redesign their project to avoid modification of certain areas deemed to be critical habitat. This project redesign typically reduces the output of the project. Again using the vernal pool case as an example, additional Section 7 conservation requirements consist of avoidance of 85.7 percent of vernal pools, a condition that allows only 14.3 percent of the project site to be developed. Project redesign imposes additional costs on developers and has other, potentially large, economic impacts that stem from the attendant reduction in output, particularly in areas like California that have a well-documented shortage of housing and urban infrastructure.

Increase in Price and Reduction in the Availability of Housing and Other Development. Because critical habitat designation increases the cost of development and reduces the level of project output, it has the potential to alter regional markets for housing, commercial space and other types of development. In particular, critical habitat designation can increase market prices for these goods and result in large losses to consumers.

Whether for homes, schools or other activities, there are numerous physical and regulatory constraints on site selection. Accordingly, if critical habitat designation places some land off-limits to development, there are a limited number of comparable sites that can be developed to pick up the slack. While an area may appear to have an ample supply of developable land, in reality the development process is highly constrained. In such a setting, critical habitat designation can reduce the regional stock of housing and other goods, and prices of these goods will increase to establish new market equilibria.

Delay in Completion of Projects. Critical habitat designation can also delay completion of projects. Unlike the supply-reduction effects just described, delay is a pure loss affecting both producers and consumers. Theoretical results suggest that in many cases delay can be the largest component of overall economic impact resulting from environmental regulation.

Delay affects project developers by pushing out project receipts further into the future. Delay affects consumers in that they must postpone the enjoyment of the project output. For example, if the project is to construct a school, then parents and children must wait to use the new facilities; if the project is to construct new homes, then homeowners must live temporarily in a less-than-optimal location, perhaps having to commute longer distances during this waiting period.

Economic Losses Borne Primarily by Consumers

The economic impacts of critical habitat designation are borne mainly by consumers. Cost increases can be passed on to consumers to some degree, and increases in market price of project outputs actually benefit producers.

A stylized example can help to provide some sense of the magnitude of impacts and their distribution across the affected population. Consider a 1,000-unit housing project to be built on 200 acres (an average of five homes per acre, including roads, open spaces and other infrastructure). The pre-regulation price of the homes in the project is

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\$250,000, and the price elasticity of demand for these homes is -1.67 . The pre-regulation marginal cost of homes in the project is assumed to be a constant \$200,000. Suppose that some of the project is considered to be critical habitat; development is to be avoided in these areas and any habitat impacts mitigated by some ratio of the USFWS's choosing. Suppose that the out-of-pocket cost to the developer of the Section 7 consultation, including the mitigation exaction, is \$2,000 per home. Suppose also that critical habitat designation reduces the size of the project to a total of 900 units instead of the planned 1,000. Finally, suppose that critical habitat concerns delay completion of the project by two years.

Based on these figures, what are the economic impacts of critical habitat designation for this hypothetical project? Homes in the project are now more expensive to construct and there are fewer of them, so their market price will increase. Under the assumptions above, the price of a home in the project will increase from \$250,000 to \$265,000.

Consumers lose from critical habitat designation in three ways. Some are unable to purchase homes at all due to the reduction in the size of the project. Some do purchase homes, but at higher prices. And what consumption does occur is two years later than it would have been without the critical habitat designation. The impacts on developers (and landowners) are more complex. While producers gain from the increase in home prices, they lose from the increase in costs and from the delay in completing the project and receiving their return on investment.

Taking consumers and producers together, the total economic losses from critical habitat designation are \$19.5 million for this project. This figure counts the cost of project delay, which amounts to \$12.5 million, or over half of total losses. While the designation reduces the size of the project from 1,000 to 900 completed units (which results mainly in losses to consumers), both consumers and producers must wait an extra two years for these 900 units to be completed.

Several interesting conclusions emerge from this example:

- ❖ Critical habitat designation can be quite expensive. Total economic losses amount to nearly \$20 million in the example, which implies costs of \$1 million per acre of habitat conserved.

- ❖ Consumers bear the brunt of losses from critical habitat designation. They are unambiguously harmed by increases in price and reductions in the number of homes available for purchase. Developers and landowners fare better because they can pass on some costs to consumers in the form of higher prices.

- ❖ Traditional measures of the cost of regulation, namely the out-of-pocket cost of Section 7 consultation, are far off the mark. In this example, they understate true impacts by more than 90 percent.

Regional and Indirect Impacts: Is Conservation Good for the Environment?

Critical habitat designation is effectively an ad hoc tax on development that changes its intensity, location and timing. As such, critical habitat designation can literally change the shape of urban areas, and another class of economic impacts results.

A natural question to ask is whether, by limiting growth in certain areas, critical habitat designation pushes development to areas more distant from the city center, away from jobs, shopping areas, schools and other amenities. If the effect of critical habitat designation is to force relocation to areas further out on the urban fringe, there can be some important regional and indirect consequences of designation as well. For example, if critical habitat designation forces commuters to locate further from their jobs, then designation may increase traffic congestion and commute times, and may contribute to regional problems of sprawl and air pollution.

Impacts Beyond the Federal Nexus

A common claim of the USFWS is that critical habitat designation only causes economic impacts in the presence of a federal nexus, that is if the activity in question is carried out with a federal permit or federal funding. While there is no definitive research on this topic, my work with developers, local government officials and others suggests that critical habitat designation has more far-reaching implications.

One concern is that development is subject to numerous regulatory processes carried out by federal, state and local authorities. If land is designated as critical habitat by the Service, this designation may affect the way the project is treated by other agencies through a "signaling" effect.

At a conceptual level, this signaling effect is not surprising. Regulators operate under uncertainty and are generally risk-averse. A decision by an expert environmental agency like the Service raises concerns about potential environmental impacts of the project and will lead other permitting agencies to take a more conservative approach to it. From a practical point of view, this signaling effect means that the costs of critical habitat designation go beyond the cost and the outcome of the Section 7 consultation process.

Another concern is that designation of critical habitat can impose costs on developers even if their project is not on critical habitat at all. The USFWS defines critical habitat in such a way that some time and expense is needed to determine whether a parcel is actually included or not. For example, critical habitat is defined in terms of landscape features and some investigation is required to determine their presence or absence on a particular parcel. Again, the practical effect is for the costs of critical habitat designation to extend beyond the Section 7 process.

Flaws in the Service's Approach to Economic Analysis

It is useful to compare the types of economic impacts just described with those categorized in the Service's analyses of various critical habitat designations. There are two major failings in the Service's approach. First, the Service emphasizes only the most obvious aspects of cost, namely the direct, out-of-pocket expenditures needed to complete the Section 7 process, and ignores the potential for regional market impacts. Accordingly, the Service ascribes all economic impacts to developers and landowners and none to consumers who will, in fact, ultimately bear most of the costs for the reasons just indicated. Thus, the Service seriously underestimates the impacts of critical habitat designation (in some cases by more than 90 percent) and also mischaracterizes their incidence.

A more basic failing of the Service's approach is that it only purports to measure the aggregate economic impacts of a proposed designation. Congress intended that economic analysis be used to help prioritize land for inclusion in critical habitat. An analysis of the total cost of designation does not help determine which parcels should be included in critical habitat and which should be

excluded. What is needed instead is a more detailed approach to economic analysis that recognizes well-known differences in the opportunity cost of land.

Conclusion

Critical habitat designation is an unusual part of the Environmental Safety Act in that the government is actually required to conduct an economic assessment of its impacts. With other provisions such as the listing of a species as threatened or endangered, for example, the Fish and Wildlife Service is forbidden from considering economic factors when making its decision. Congress' intent in this regard was not to use economic factors in deciding whether or not a species should be protected, but rather to balance economic and biological considerations in determining the specific geographic areas in which protection should occur.

It should also be noted that several critical habitat designations have been overturned by federal courts due to the inadequacy of the government's economic analysis. Accordingly, it is useful to compare the types of economic impacts just described with the method used by the Service in its previous analyses of economic impacts of critical habitat designation.

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