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THE ENDANGERED SPECIES ACT AND THE SEARCH FOR BALANCE

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The Endangered Species Act¹ adopted by Congress in 1973, was the nation's first comprehensive endangered species protection program. This act's most noteworthy feature was its recognition that conventional economic activity, by affecting habitat, could pose at least as much a danger to the extinction of species as could direct predation. Section 7 of the new act provided a way to stop a great many projects which threatened endangered species, regardless of their social or economic benefits. While environmentalists hailed the measure, others viewed it with alarm. Their fears were well expressed by Senator Jake Garn of Utah: "[T]here are enough obscure species of plants and animals to guarantee that nothing at all will happen in this country if no endangered species is ever to be disturbed in its corner of the environment."²

In 1978, the act was amended, largely in response to the Tellico Dam controversy, to provide some balance between these two viewpoints.³ These amendments instituted a procedure whereby non-environmental objectives could be weighed against the goal of endangered species protection.

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1. 16 U.S.C. §§ 1531-1543 (1976 & Supp. III 1979). The first federal action concerning the general problem of extinction of wildlife was the Endangered Species Preservation Act of 1966 Pub. L. No. 89-669, 80 Stat. 926, which called upon the Secretary of the Interior, in consultation with wildlife experts, to publish a list of species threatened with extinction and appropriated funds for the acquisition of lands upon which these species would be protected. Extension to foreign species was made by the Endangered Species Conservation Act of 1969, Pub. L. No. 91-135, 83 Stat. 275 (repealed 1973), which authorized the listing of foreign species and prohibited their importation into the United States except under certain circumstances. For an extensive discussion of this and other federal legislation affecting wildlife see M. BEAN, *THE EVOLUTION OF NATIONAL WILDLIFE LAW* (1977).

2. *Amending the Endangered Species Act of 1973: Hearings on S. 2899 Before the Subcomm. on Resource Protection of the Senate Comm. on Environment and Public Works*, 95th Cong., 2nd Sess. 45 (1978) [hereinafter cited as *1978 Hearings*].

3. See 16 U.S.C. § 1531-1543 (1976 & Supp. III 1979), as amended by Pub. No. 96-159 93 Stat. 1225 (1979). Section 7 was the most important, though not the only, source of dissatisfaction with the 1973 act. Lachenmeier, *The Endangered Species Act of 1973: Preservation or Pandemonium?*, 5 ENV'TL LAW 29 (1974).

The purpose of this article is to examine this search for balance. Specifically, to what extent was the implementation of the 1973 act posing an actual versus a potential threat to economic development? What was the nature of the economic objectives sacrificed? Finally, how did the 1978 amendments affect endangered species protection and economic development?

THE ENDANGERED SPECIES ACT OF 1973

This act modified previous endangered species protection legislation in several significant ways. First, regulatory authority was given to the Secretary of Interior for preservation of endangered species within the United States. It became unlawful to "take" (kill, capture, or hurt) an individual member of an endangered species.⁴ Thus, direct actions against endangered species were prohibited.

Second, the act established formal categories for endangered and threatened species together with criteria for inclusion on a list of endangered and threatened species. Although species listed as threatened with extinction pursuant to the 1966 and 1969 acts were automatically made members of this list, additions to it could only be made through informal rulemaking procedures.⁵

Third, for the first time the indirect effects of economic activity on endangered species' survival could be regulated. Section 7 authorized the Secretary of Interior to designate, as appropriate, areas of critical habitat for particular species. In addition, all federal departments were required to ensure that actions authorized, funded, or carried out by them did not jeopardize the continued existence of endangered species or modify their critical habitat. Furthermore, they were to consult with the Fish and Wildlife Service (FWS) whenever there was a possibility that an endangered species would be affected.⁶

A fourth innovation in the 1973 act was a citizen suit provision, which permitted any person to file a civil suit against the United States and any of its agencies to enjoin them from violating the act.⁷

The Importance of Section 7: Its Effect on Economic Development

Section 7 soon emerged as the most effective and controversial feature of the 1973 act, because it permitted the regulation of vir-

4. 16 U.S.C. § 1538 (1976).

5. The rules of most federal agencies are promulgated by informal (also called notice-and-comment) rulemaking, as specified in Section 5 of the Administrative Procedures Act, 5 U.S.C. § 553 (1976). See Pedersen, *Formal Records and Informal Rulemaking*, 85 YALE L.J. 38 (1975).

6. 16 U.S.C. § 1536 (1976).

7. 16 U.S.C. § 1540 (1976).

tually all activities having possible impacts on endangered species. Although only federal action was regulated, this limitation was not restrictive, inasmuch as economic development having even modest environmental impact already required a federal permit of some kind, especially in the West.

Also, while Section 7 did not contemplate direct intervention by the Fish and Wildlife Service, the procedure that emerged allowed extensive opportunities for the regulation of projects. Other federal agencies had direct responsibility and regulatory authority to protect endangered species jeopardized by activities performed, funded, or otherwise permitted by them. The Fish and Wildlife Service's authority came from the consultation requirement, which resulted in a biological opinion issued by FWS on effects of the action on endangered wildlife. If the biological opinion found the action would jeopardize species' survival, then the action would have to be cancelled or appropriately modified.⁸

The potential effects of Section 7 on development were especially important in areas which had been designated as critical habitat for particular species. In such areas, FWS could issue an unfavorable biological opinion upon a showing that habitat would be altered. There was no need to show that the species' existence was jeopardized.

It is useful to compare Section 7 to Section 102 of the National Environmental Policy Act,⁹ with which it has certain procedural resemblances. NEPA makes environmental quality an objective of national policy. In particular, Section 102 states that federal programs give environmental objectives "appropriate consideration in decisionmaking along with economic and technical considerations." To that end, Section 102(C) requires the preparation of an environmental impact statement (EIS) for most federal actions that may affect environmental quality. Similarly, the Endangered Species Act requires that federal agencies report the effects of their actions on endangered species (in fact, this determination is usually made as part of an EIS) and if necessary, that they consult FWS.

However, Section 7 goes far beyond a requirement that agencies give appropriate consideration to effects of their actions on endangered species (presumably required by NEPA anyway). If the consultation determines that a proposed agency action poses a threat to the survival of an endangered species or its critical habitat, then the proj-

8. Although the possibility of balancing endangered species protection with other objectives had been allowed by the eighth circuit court in *Sierra Club v. Froehle*, 534 F.2d 1289 (1976), this position was later rejected by the Supreme Court in *TVA v. Hill*, 437 U.S. 153 (1978). See Stromberg, *The Endangered Species Act of 1973: Is the Statute Itself Endangered?*, 6 ENVTL AFF. 511 (1978).

9. P.L. 91-190, 83 Stat. 852 (codified at 42 U.S.C. § 4332 (1976)).

ect must be altered or cancelled in order to remove that threat. In other words, rather than balance endangered species considerations with other considerations, the act requires that adverse impacts on endangered species be avoided regardless of other objectives.

For development projects, the consultation process thus raises the possibility of costly alterations or substantial delays. Regulations promulgated by the Fish and Wildlife Service and the National Marine Fisheries Service require that "[u]ntil consultation has been completed and a biological opinion has been issued, good faith consultation shall preclude a Federal agency from making an irreversible or irretrievable commitment of resources which would foreclose the consideration of modifications or alternatives to the identified activity or program."¹⁰

This regulation could stop work on a project by imposing lengthy delays while biological studies are completed to determine negative impact on endangered species or critical habitat. In one case, for example, FWS at first estimated that three years would be required to conduct the studies necessary to render the biological opinion.¹¹

Although these regulations are applicable only to listed species, fears have been expressed that the Endangered Species Act provides a "hunting license" for environmental groups who could stop any project by discovering some obscure species or subspecies in the affected area. Environmental groups could intervene both through the citizen suit provision and through FWS regulations whereby any person may petition for the review of the status of any species.¹² If, as a result of this petition, the species is listed, the project becomes subject to the act, and a consultation process must be initiated. The possibility of intervention thus creates considerable uncertainty for proposed projects.

As a result, Section 7 can have a severe impact on economic development. Has this potential been realized? What in fact have been the impacts of the act on economic development? A thorough answer to this question is beyond the scope of this paper, inasmuch as the Fish and Wildlife Service has been involved in about 20,000 consultations with other federal agencies. However, a preliminary examination suggests that in only a handful of cases has the act led to irresolvable conflicts between economic development and endangered species

10. 50 C.F.R. § 402.04 (1979).

11. This estimate was made by the Denver Regional Office of the Fish and Wildlife Service in the biological opinion submitted to the Omaha District of the Corps of Engineers, December 15, 1977, on the effects of Grayrocks Dam and Reservoir on the survival of the whooping crane.

12. 50 C.F.R. § 17.13 (1979).

protection. We turn now to a brief overview of several cases to see how such conflicts have been resolved.

Litigation to Protect Endangered Species

1. Devil's Hole pupfish. In *United States v. Cappaert*,¹³ the United States brought suit for a declaration of its rights to the waters necessary to maintain the habitat of the Devil's Hole pupfish and a permanent injunction against a nearby rancher to prevent pumping that would lower the water level in Devil's Hole. The injunction was granted.

2. Mississippi sandhill crane. In *National Wildlife Federation v. Coleman*,¹⁴ NWF brought an action to halt construction of a six-mile segment of Interstate Highway 10 (I-10), which would have disrupted the habitat of the Mississippi sandhill crane, a subspecies consisting of only 40 individuals. The court of appeals found that the defendants had failed to ensure their actions would not adversely affect the crane's habitat and granted an injunction preventing further construction. The highway was completed after the defendants made changes suggested by the Fish and Wildlife Service.

3. Indiana bat. In *Sierra Club v. Froehlke*,¹⁵ an injunction was sought to prevent construction of the Maramec Park Lake Dam in Missouri, which would flood caves inhabited by the Indiana bat. The appeals court refused to grant the injunction on the basis that the plaintiffs failed to demonstrate that the existence of the Indiana bat would be jeopardized.

4. Snail darter. Plaintiffs sought an injunction against completion of TVA's Tellico Dam in Tennessee on the grounds that it would cause extinction of the snail darter by flooding its habitat in the Little Tennessee River, the only place where snail darters were known to exist. The United States Supreme Court ruled in *TVA v. Hill*¹⁶ that protection afforded endangered species by Section 7 was absolute (TVA had argued that congressional appropriation of funds for the completion of the project after the listing of the snail darter was evidence of congressional intent). The furor that arose after the injunction was granted precipitated the 1978 Amendments to the act, which specified that the Tellico project be reviewed by a cabinet-level panel for pos-

13. 426 U.S. 128 (1976). Although the Endangered Species Act was involved in this case because of the threat to the endangered pupfish, the principal legal issue concerned the extension of the doctrine of federal reserved water rights to groundwater and also to *in situ* use of water. C. BORIS & J. KRUTILLA, WATER RIGHTS AND ENERGY DEVELOPMENT IN THE YELLOWSTONE RIVER 34 (1980).

14. 529 F.2d 359 (5th Cir. 1976).

15. 534 F.2d 1289 (8th Cir. 1976).

16. 437 U.S. 153 (1978).

sible exemption. This panel found estimated benefits from completion of the dam did not justify the cost of finishing it and failed to grant an exemption. Subsequently, Congress specifically exempted the Tellico project from the Endangered Species Act.¹⁷

5. Furbish lousewort. This variety of snapdragon, long thought to be extinct, was rediscovered by the U.S. Corps of Engineers during preparation of the draft EIS on the Dickey-Lincoln project, a planned hydroelectric facility on the St. Johns River in northern Maine.¹⁸ A compromise was worked out in which only some of the affected area would be flooded, but the House Public Works and Transportation Committee subsequently withdrew its support for the project, making completion unlikely.¹⁹

6. Woundfin. Construction of the Warner Valley Dam could decrease the flow in the Virgin River in southwestern Utah, and thereby threaten existence of the woundfin, an endangered minnow found only in the Virgin River. Water stored behind the dam would be used to supply a 500-megawatt power plant and to meet the needs of the city of St. George, Utah. This project is now on "hold" pending further investigation by the FWS of actual instream flow requirements of the woundfin.²⁰

7. Whooping crane. In *Nebraska v. Ray*,²¹ an injunction was granted to prevent completion of Grayrocks Dam in eastern Wyoming, partly because of effects of increased water consumption by a power plant on the whooping crane habitat in the Platte River channel 300 miles downstream. A compromise was reached in which the power companies created a trust fund for purchasing downstream water rights to replace water used by the plant.

8. Colorado squawfish. The Colorado River Water Conservation District has applied for a permit from the Federal Energy Regulatory Commission to construct Juniper Dam on the Yampa River in northwest Colorado. In preliminary discussions, FWS disclosed that the dam would inundate an area inhabited by the Colorado squawfish and that a consultation may result in an unfavorable biological opinion.²²

17. This provision was contained in the Energy and Water Development Appropriation Act 1980, Pub. L. No. 96-69, 93 Stat. 449.

18. *Furbish Lousewort Among 13 Plant Taxa Newly Listed by Service for Protection*, 5 ENDANGERED SPECIES TECH. BULL. 1 (May 1978) [hereinafter cited as *Furbish Lousewort*].

19. 35 CONGRESSIONAL QUARTERLY ALMANAC 687 (1979).

20. Telephone conversation with David Everett, Bureau of Land Management, Cedar City, Utah (October 15, 1978).

21. *Nebraska v. Rural Electrification Administration*, Nos. 76-L-242, CV-78-L-90 (D. Neb. Oct. 2, 1978).

22. 1978 Hearings, *supra* note 2, at 224 (statement of Kenneth Balcomb). The project would also destroy the mating site of a pair of peregrine falcons, another endangered species. The squawfish is an example of an endangered species that may already be doomed by pre-

Water Resources Development Projects: Inundation and Depletion

In six of these eight cases, a water resource development project was involved; the threat to endangered species was either too much water (inundation of critical habitat) or not enough (streamflow depletion) as follows:

INUNDATION

Maramec Dam (Indiana bat)
 Dickey-Lincoln Dams (Furbish lousewort)
 Tellico Dam (Snail darter)
 Juniper Dam (Colorado squawfish)

DEPLETION

Grayrocks Dam (Whooping crane)
 Warner Valley (Woundfin)

The distinction between inundation and depletion is important for three reasons. First, the impacts of depletion are marginal, while inundation involves a complete change of habitat (from terrestrial or riverine to lacustrine). Compromise possibilities for inundations are therefore more limited although they still exist. One possibility is to operate a facility as a dry dam, which may allow the species to be preserved and some of the economic benefits to be realized. This possibility was mentioned in connection with the Tellico case, but was rejected as being too costly.²³ The only other possibility is to reduce the size of the reservoir and destroy a part of the habitat. This was the principal feature of a compromise settling the dispute over the Dickey-Lincoln Dams.

A second important difference between inundation and depletion is the predictability of the impact which development will have on species survival. Inundation drastically alters habitat with complete certainty. If the species is to survive, either the habitat is not critical after all, or else it must be possible to move a self-sustaining population to another site.²⁴ Neither may offer much hope for species sur-

vious alterations to its habitat. Behnke, *The Impacts of Habitat Alterations on the Endangered and Threatened Fishes of the Upper Colorado River Basin*, in 2 ENERGY DEVELOPMENT IN THE SOUTHWEST: PROBLEMS OF WATER, FISH AND WILDLIFE IN THE UPPER COLORADO RIVER BASIN 204 (1980).

23. See Tennessee Valley Authority, *Alternatives for Completing the Tellico Project* 27 (report prepared in December 1978).

24. In fact, the transplant of the snail darter from the Little Tennessee to the Hiwassee and Holston Rivers is perhaps the last hope of the species. According to Harold O'Connor of FWS, "We are afraid that the chances of long-term survival for these populations is not good, but we feel that it is our responsibility to do everything we can to prolong the snail darter's existence." *Tellico Dam Gets Go-Ahead*, 10 ENDANGERED SPECIES TECH. BULL. 11 (October 1979).

vival. In contrast, the consequences of streamflow depletions are much more uncertain. Presumably, increasingly large changes in streamflow will cause progressively larger changes in habitat, until eventually catastrophic change occurs. But predicting precisely the effects of such depletions on habitat is difficult if not impossible.

Finally, with inundations conflicts between species preservation and development are usually confined to reservoir sites,²⁵ whereas depletion affects all downstream habitats. Thus, we can expect that conflicts involving depletions, while more resolvable, are also more common, especially in arid regions.

Between 1973 and 1978 the Endangered Species Act appears to have affected only a small number of projects, and only in a minority of those did a conflict arise that could not be resolved. This suggests that implementation of the act did not impose major barriers to economic development. However, projects that were impinged upon were affected substantially, even if a compromise was reached. For example, the main feature of the agreement in the Grayrocks case was a substantial payment (\$7.5 million) by the power plant consortium to purchase water rights downstream to replace the depletion caused by the project. In addition, the Fish and Wildlife Service will presumably regard future depletions on the upper Platte as modifications of critical habitat and attempt to stop them. If FWS is successful, Section 7 will effectively prevent further depletions from the upper Platte.

Thus, the total costs imposed so far by implementation of Section 7 appear not to be very high, but they are distributed very unevenly. For most people the economic impact of Section 7 has been negligible. The costs have been borne almost exclusively by the beneficiaries of canceled, altered, or delayed projects. This distribution of costs rather than total costs may have influenced the movement to amend the act.

POLICY OBJECTIVES AND CRITERIA FOR EVALUATION

To understand the controversy which led to the 1978 amendments it is useful to consider in a general way the problems of formulating endangered species policy.

Objectives of Endangered Species Protection

Why is it necessary to have an endangered species policy, and what can it be expected to accomplish? Considerable disagreement sur-

25. One possible exception is that a reservoir might interrupt fish migratory patterns.

rounds possible answers. Wild plant or animal populations are what economists call "public goods." Because private interests are rarely able to appropriate all the benefits obtainable from feral populations, insufficient private incentives exist to preserve them. The resulting failure of markets to protect endangered species provides a reason for public intervention. Of course, the market cannot be blamed for the entire problem of vanishing species. In the Tellico Dam case, for example, the snail darter was jeopardized by an action of the Tennessee Valley Authority (TVA), a federal agency. Nonetheless, the principle remains the same: wildlife species have become excessively endangered because benefits of their survival have not been counted by decision-makers, whether public or private. The extinction of a species means the irreversible loss of a unique biological asset; therefore, future generations have an interest not reflected in market decisions.²⁶ Even if a species provides no benefits in the present, it may in the future. To take into account this uncertainty in the preferences of future generations, a premium must be placed on the value of the irreplaceable asset.²⁷

What are, in fact, the benefits of endangered species protection? In the 1978 senate hearings to amend the Endangered Species Act, the most frequently encountered justifications for a general policy of endangered species protection were first, that each species is a repository of unique general information, and second, that extinction is irreversible.²⁸ For all we know, it is argued, a species regarded today as worthless and obscure may some day be essential to a cure for some previously incurable disease.

This argument may be appealing, but it is limited. It is true that exotic plants and animals provide enormous commercial and scientific benefits, especially in medicine. Nonetheless, such species form a very small minority of all species, suggesting the probability that a given species will some day have economic significance is equally small. We may be able to assign higher probabilities to some species than others, but this implies that some species are worth saving more

26. Discussions of the public good aspects of endangered species preservation are found in Bachmura, *The Economics of Vanishing Species*, 11 NAT. RES. J. 674 (1971), and Plourde, *Conservation of Extinguishable Species*, 15 NAT. RES. J. 791 (1975).

27. The argument for a premium placed on irreversible assets to preserve future options was first made by Krutilla, *Conservation Reconsidered*, 57 AM. ECON. REV. 777 (1967). See also J. KRUTILLA & A. FISHER, *THE ECONOMICS OF NATURAL ENVIRONMENTS: STUDIES IN THE VALUATION OF COMMODITY AND AMENITY RESOURCES* (1975); Bishop, *Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard*, 60 AM. J. AG. ECON. 10 (1978).

28. See, e.g., *1978 Hearings, supra* note 2, at 73, 227 (comments of Michael Bean and Senator Kaneaster Hodges).

than others.²⁹ If such judgments are to be avoided, endangered species protection must ultimately be based on ethical rather than economic grounds.

More importantly, it is questionable whether the concepts of uniqueness and irreversibility fully capture the benefits of endangered species preservation. If preservation of genetic information were the only benefit, other policies besides preservation of species in the wild could be considered. Captive populations could be an acceptable policy objective, for example, as would a breakthrough in biological engineering to reproduce plants or animals from genetic information saved *in vitro*. Such a genetic ark would make irreversibility irrelevant. These alternatives are at present technically infeasible,³⁰ but even if they were not, it is unlikely that either would be universally accepted as a solution to the problem of vanishing species. To most people, endangered species protection means the maintenance of populations in the wild. This is certainly true for those species noted for their beauty or nobility, such as the bald eagle, whooping crane, or snow leopard. Many people receive considerable satisfaction simply knowing that these creatures are alive and well in their native habitat. In addition, maintenance of wild populations may be important for obscure species as well, for endangered species policy objectives may include not only preservation of species in the wild, but preservation of the wild itself.

The obscure species which have figured in certain recent controversies are, in particular, part and parcel of very specific environments. Their disappearance, almost invariably, signals the functional end of the habitat in which they lived. . . . Their disappearance signals the end perhaps of free-flowing unpolluted water on a river, the end of inland marshes in a region. It also signals the end of any bond that they had with the land. As species they are, admittedly, insignificant, but in the totality of their environment, they are something else.³¹

This objective is especially relevant to a discussion of Section 7, because it is the only section of the act explicitly concerned with habitat. In most of the Section 7 cases mentioned earlier, preservation of a natural environment along with survival of an endangered species was at stake. For example, depletion of the Platte River by upstream diversions like Grayrocks Dam posed a direct threat to the wetlands

29. Some criteria for the judgments are suggested by Ramsey, *Priorities in Species Protection*, 5 ENV'T'L AFF. 595 (1976).

30. Although captive breeding is possible for many species, there are also many for which it is not at the present time.

31. 1978 *Hearings*, *supra* note 2, at 81 (statement of Tom Garrett).

ecosystem in the Platte River Channel.³² Similarly, it is said that closing Tellico Dam would eliminate the last remaining free-flowing stream in eastern Tennessee, and inundate archeological sites of traditional and religious significance to the Cherokee. Thus, the benefits of Section 7 go far beyond the effects on individual endangered species.

If ecosystem preservation is a goal of Section 7, then the range of acceptable alternative policies would be considerably different (and probably narrower) than if the objective were simply to preserve a particular threatened species.

The Effectiveness of Endangered Species Policy

A policy is effective to the extent that implementation successfully achieves its objectives. Thus, an endangered species policy is effective to the extent that species which otherwise would have become extinct are preserved. Unfortunately, it is very difficult to tell whether the policy is having such an effect, for two reasons. First it will not often be evident whether a species' long range survival prospects are improving or worsening. Even if no individuals of a species can be found it may reflect failures of the reporting system rather than failures of the policy. The extinction of a species therefore may not become evident until long after its occurrence. Second, the extinction or prosperity of a species may occur for reasons having little to do with policy.

Given such uncertainties about the ultimate outcomes of policy, it is natural to measure success with respect to intermediate or instrumental outcomes. Thus, FWS maintains a count of listed species and critical habitat designations, the "Box Score," which appears each month in the *Endangered Species Technical Bulletin* on the assumption that listed species are better protected than unlisted ones. Section 7 was designed to achieve another intermediate objective: the preservation of natural habitat. But it must be remembered that there is no guarantee that restrictions on development will preserve habitat, or that habitat preservation will save the species in question.

As noted in the preceding discussion, Section 7 can also be regarded as a device for wilderness preservation, and its effectiveness in this

32. In the last century the average annual flow in the Platte River at North Platte, Nebraska has decreased from about 2,600,000 acre feet to about 400,000 acre feet. It is believed that this decline has caused an 85 percent reduction in the width of the channel above Lexington, Nebraska and a 60 percent reduction between Lexington and Grand Island. G. WILLIAMS, *THE CASE OF THE SHRINKING CHANNELS: THE NORTH PLATTE AND PLATTE RIVERS IN NEBRASKA* (U.S. Geological Survey Circular 781, 1978).

context may be easier to assess. Its use for this purpose is limited to those cases where a listed species, and preferably, a critical habitat, has been designated. Therefore, this section is probably not as widely applicable as legislation designed specifically to protect wilderness areas. However, the areas to which it can be applied are likely to be especially desirable for wilderness preservation; the presence of a unique species often indicates the existence of some unique attribute or combination of attributes in an area.

Endangered Species Protection and Efficiency

Section 7 was effective (in the limited sense used above) because it subordinated all other objectives to the cause of endangered species protection. But this same feature exposed the act to charges of economic inefficiency. Because public policy requires objectives other than preservation of endangered species, decisions must be made regarding how to allocate society's limited resources to each objective. Ideally, tradeoffs among competing objectives enter social decision-making in the budgetary process. In practice, these tradeoffs will be very rough, inasmuch as one rarely knows with precision the relationship between money allocated and effectiveness (program outputs). However, this rough budgetary balancing process is not possible for agencies with significant regulatory responsibility, because the costs of their regulations are not borne by them but by those who are regulated.

Thus, efficiency seems to require that an agency charged with protecting endangered species must weigh the benefits of such protection against the costs. But how are such tradeoffs to be made? Calculation of the economic benefits from a species is simply impossible at present, and no foreseeable advances in methodology or data development are likely to change this situation. Important nonquantifiable values must be considered in deciding whether to take action on behalf of an endangered species. Thus formal benefit-cost analysis is not a very helpful tool for endangered species cases.

However, the inappropriateness of benefit-cost analysis does not mean that efficiency is an irrelevant concept for endangered species protection policy. For one thing, the choice is rarely mutually exclusive (either this project or that endangered species, but not both). More commonly, the development in question will destroy only some individuals or subpopulations of the species, or is uncertain as to its impact on any individual. In either case, the probability that the project will lead to extinction is greater than zero but less than one.

In fact, the central issue of endangered species policy is not whether projects that will eradicate a species will be allowed, but the

extent to which activities will be controlled to reduce the risk faced by endangered species. Every endangered species presumably faces a risk of extinction (otherwise it would not be considered endangered). Actions to protect endangered species, including regulations to protect habitat, will reduce these risks. However, to reduce the risks altogether would require the regulation of activities having only a remote connection to endangered species, and regulation of such scope would probably be prohibitively costly. Thus, there must be some level of risk that is acceptable.

Under the 1973 act, the Fish and Wildlife Service was exclusively concerned with effectiveness, and therefore wrote regulations showing a strong aversion to risk. Economic considerations entered only through pressure from outside the agency.

This aversion to risk is illustrated by the regulatory activities connected with the whooping crane migratory habitat on the Platte River in central Nebraska. Critical habitat proposed in 1975³³ included an area of 2,600 square miles, much of which had not had a confirmed whooper sighting in many years. After strenuous citizen protests, the critical habitat finally promulgated in 1978 was a three-mile wide strip containing the Platte River, with a total area less than one-tenth that of the proposed critical habitat.³⁴ Even along the Platte, suitable crane habitat shrunk by over 50 percent between 1938 and 1976, a period during which the whooping crane population nearly quadrupled,³⁵ suggesting that perhaps the loss of habitat was not that critical after all.

The Service's stance toward risk was also evident in the biological opinion that Grayrocks Dam would adversely affect critical habitat downstream. It was estimated that the power plant and dam would reduce the annual flow in the critical habitat by no more than three percent. Although the historical evidence suggested that previous flow reductions had resulted in a decline in the area of suitable habitat, there was no evidence that such reductions had had harmful effects on the whooping cranes. Even so, it seems likely, if not inevitable, that at some point the further loss of habitat would affect the cranes. The effects of shrinking habitat could even be catastrophic if the chances of an outbreak of disease were increased. The problem was how to determine the point at which further development of the Platte would be harmful. Faced with planned future depletions on the Platte totaling over 40 percent of present annual flow, some of which

33. 40 Fed. Reg. 58,308 (1975).

34. 43 Fed. Reg. 20,938 (1978).

35. Office of Endangered Species, U.S. Fish and Wildlife Service, Preliminary Draft Recovery Plan for the Whooping Crane (December 1977).

might be beyond the jurisdiction of the Endangered Species Act, FWS took a very conservative stance.³⁶

The existence of risk, rather than certain extinction, also raises the possibility that other approaches may be substituted for regulation. Such approaches fall under the general heading of wildlife management, but in fact are so varied as not to be easily categorized. For example, whooping crane eggs can be transplanted into the nests of sandhill cranes, which then act as foster parents for the intruders. Another practice is to warn hunters by radio whenever whoopers in the vicinity take to the air so that they will not be shot by mistake. Still another technique being considered is the mechanical enhancement of habitat along the Platte River in Nebraska (on the cranes' annual migration route).³⁷

Many wildlife management techniques show promise in enhancing survival prospects of endangered species, but the question here is whether they can be expected to act as substitutes for regulation (that is, whether more development can be compensated for by more wildlife management when it is economically advantageous to do so). The use of wildlife management in this context is decidedly less promising. For one thing, the use of many such management alternatives may not be consistent with the habitat conservation objectives of endangered species policy as discussed above. In addition, effective wildlife management requires considerable knowledge about the behavior and habitat requirements of the species to be protected. For abundant species, the needed information is either known or can be collected through experiments with management techniques. Often, however, very little is known about the habits of endangered or rare species, and predicting responses of such species to management techniques is problematical. That is, wildlife management may be more appropriate to supplement the control of development rather than to replace it.

Endangered Species Protection and Equity

Efficiency is only concerned with the total costs and benefits of a course of action, but the fair distribution of these costs and benefits is an equally important criterion. Obviously, a regulation that causes a development project to be altered or canceled to avoid impacts on

36. Harrington, *The Endangered Species Act and Water Resource Development* 31 (report prepared for the Los Alamos Scientific Laboratory, 1980).

37. Preliminary Draft Recovery Plan for the Whooping Crane, *supra* note 35. The cranes require open sandbars in the river free of vegetation. The vegetation is naturally controlled by scouring during floods, and "mechanical enhancement" refers to the mechanical removal of such vegetation.

endangered species or critical habitat imposes costs in opportunities foregone. Less obvious, but no less real, are the costs imposed on a landowner by a critical habitat designation in the form of increased uncertainty regarding future regulation. Who should bear these costs?

The implicit answer given by Section 7 is that they should be borne by the developer and those who would otherwise have benefited from the development. This particular distribution of the costs of endangered species protection may be inevitable. In theory, of course, the government could compensate the developer for changes necessary to reduce the risk to the species, up to and including purchase of the habitat for preservation. Under an efficiency criterion, one would be indifferent to these alternatives, because total costs and benefits are the same. The choice is also ambiguous with respect to what is fair, because conflicting ethical principles are involved. A "polluter-pay" principle would impose the costs on the developer. In so doing, however, one of the canons of equity used in public finance, willingness to pay, would be violated. The willingness to pay criterion suggests that the cost of endangered species protection should be borne by the public at large, or perhaps by environmentalists with an especially strong interest in endangered species protection.

Nonetheless, the practical problems associated with compensating losers in endangered species cases are enormous. For one thing, perverse incentives would be created if the government had to compensate developers for projects halted or amended to prevent damage to endangered species. Developers would have an interest in claiming to build such projects even if they had no real interest in doing so. More importantly, the government is often the developer. Most of the cases discussed above, in fact, were partially or completely financed with federal money. Completion of these projects implies a transfer of funds from the nation to the region in which the development takes place. The beneficiaries of such projects are local inhabitants who enjoy cheaper electric power, increased water supplies, and flood control. To make them indifferent to the cancellation of such a project would mean identifying the beneficiaries and valuing the benefits each receives. Because many of the benefits are nonmarket goods and because their distribution is likely to be diffuse in the region, it would be difficult, if not impossible, to compensate for the cancellation of a project.

Since compensating losers is so impractical, a regulatory strategy was adopted for protecting species habitat, letting costs fall rather haphazardly on those developers unlucky enough to choose areas where endangered species live. Section 7 is thus a policy that imposes concentrated costs and diffuse benefits. This kind of policy is rarely

implemented.³⁸ Perhaps it was in this instance because the losers had not been identified at the time the 1973 act was passed. During the next five years, as the impacts of the act were keenly felt, pressure began to build to amend the act. The result was the 1978 amendments to the act.³⁹

THE 1978 AMENDMENTS TO THE ENDANGERED SPECIES ACT

In part, the 1978 amendments give formal congressional approval to regulations and practices previously established by the Fish and Wildlife Service. The act requires the preparation and implementation of recovery plans for conserving listed species. In fact, the Fish and Wildlife Service had already been preparing such plans for a number of years, and at the time of enactment, 18 plans had been completed and 64 recovery teams were preparing others. Similarly, the process outlined in the act for interagency consultation in Section 7(a-d) is essentially the same as FWS regulations promulgated on January 4, 1978.⁴⁰

Each federal agency is required to request from the Secretary of Interior information on whether endangered species may be present in the region to be affected by a project. If the Secretary advises that such a possibility exists, the agency must complete within 180 days a biological assessment to identify endangered species that may be present. If a project could affect an endangered species, the Secretary must submit within 90 days a biological opinion stating whether in his or her view the proposed action will affect the species or its habitat. In addition, the Secretary must suggest modifications to the project that will remove these effects. Neither the agency nor its licensee may make any irreversible commitment of resources that would foreclose such modifications during the consultation process. Further, if the biological opinion concludes that the action will adversely affect the species or its habitat, the project must be altered in accordance with the opinion, or an exemption must be secured. By explicitly stating that a project cannot proceed in defiance of an unfavorable biological opinion, the amendments remove one source of ambiguity in the 1973 act.

But the amendments also include some noteworthy changes that bring flexibility to the act and allow incorporation of other considerations under certain circumstances. The impetus for these changes was *TVA v. Hill*. It was felt by many congressmen that the Court's

38. Wilson, *The Politics of Regulation*, in *SOCIAL RESPONSIBILITY AND THE BUSINESS PREDICAMENT* (J. McKie ed. 1974).

39. Pub. L. No. 95-632, 92 Stat. 3751.

40. 43 Fed. Reg. 870 (1978).

absolute interpretation of Section 7 was not what they had intended, so the act was amended to allow tradeoffs among competing objectives. Congress ensured, however, that such tradeoffs would not be made lightly.

To balance endangered species protection against other considerations the amendments established a process by which a project may be exempted from the requirements of the act. To rule on exemptions, a seven-member Endangered Species Committee was established, consisting of the Secretary of Agriculture, the Secretary of the Army, the Chairman of the Council of Economic Advisors, the Administrator of the Environmental Protection Agency, the Secretary of Interior, the Administrator of the National Oceanic and Atmospheric Administration, and one member from the state or states affected by the action under consideration.

The exemption process works in the following way. If the biological opinion concludes that a federal action could "jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify the critical habitat," any of the principals (the federal agency, the governor of the state in which the project is to have taken place, or the licensee) may apply to the Secretary of Interior for an exemption. Thereupon, a three-member review board is appointed to consider the application. After determining that an irresolvable conflict does, in fact, exist and that the exemption applicant has carried out the consultation responsibilities in good faith, the review board prepares a report on the application for the Endangered Species Committee. Although not required, the review board may (and probably will) conduct one or more adjudicatory hearings. Upon receiving the review board's report, the committee may grant the exemption (possibly conditioned on the performance of certain enhancement measures) if five of its members so vote. Any outcome of the exemption process may be reviewed in the court of appeals.

Nonetheless, the exemption process could be less important than it seems. In the first place, Congress apparently envisioned that few exemptions would be considered, and fewer granted. The Endangered Species Committee is composed of seven high-ranking officials—presumably busy people with little time to be routinely involved with the endangered species committee.

Moreover, the entire exemption process could cause significant delays, even though Congress did place time limits on each step. The time limits given in the amendments could take up to nine months from inception of a project to the rendering of the biological opinion. If an exemption is applied for, it will take an additional year. Thus, almost two years must pass before an irreversible commitment of re-

sources can be made. This means that little work can be done on the project until after the endangered species problem is resolved.

The actual delay could be even greater than these 21 months. First, of course, is the possibility of judicial review. Second, there is no sanction for missing a deadline. Many deadlines in other federal legislation are routinely missed by operating agencies.⁴¹ Third, the applicant is financially responsible for the mitigation or enhancement measures that the committee may require. As a result, the committee must have assurances that the funds are available and that such measures will be completed before the exemption can be granted. For federal agencies with development responsibility, this means that the funds for mitigation and enhancement measures must be authorized and appropriated by Congress.

Changes concerning the listing of species made in the amendments are possibly of greater significance than the exemption process. Where practicable, a critical habitat now must be designated at the same time a new species is listed. This designation obviously is not practicable for foreign species, but Congress clearly intended the great majority of domestic species to be included. The failure to designate critical habitat must be justified when the regulation is proposed. Second, in designating critical habitat, FWS must consider economic impact, and must apply a benefit-cost test to any area unless it is determined that its exclusion from critical habitat will result in the extinction of the species. Third, the amendments limit to two years the time between proposal and promulgation of a regulation to list a new species. If no regulation is promulgated within this period, the proposal must be withdrawn and cannot be repropoed unless new information becomes available. Fourth, the status of each listed species is to be reviewed every five years. Finally, the listing process itself was changed in important ways. The Secretary must give notice and hold hearings in or near potential critical habitats of proposed listings, and at the time of the proposal FWS must specify those activities that would adversely affect the habitat and therefore would face prohibition after the listing and habitat designation. New listing requirements will probably reduce significantly the rate at which new species are added to the list. Indeed, every change mentioned above works in this direction. It is impossible to say exactly how much the rate will decline, but an upper limit is the rate at which critical habitats are designated. If economic impact and local participation re-

41. See, e.g., Magat, Gianessi & Harrington, *Environmental Regulation in Theory and Practice: EPA's Process of Setting Best Practicable Control Technology Standards* (report prepared for National Technical Information Service, October 1978).

quirements play an important role, the actual rate may be considerably less than it has been.

One can make a good argument that these changes will have little effect on development projects. After all, nearly 200 species are already on the list. Besides, species that are not on the list may be proposed for inclusion in relatively short order. Though a biological assessment is required only in those areas where listed or proposed species are suspected to be present, a routine EIS may turn up specimens of a previously unsuspected endangered species—as indeed happened with the Furbish lousewort. Although it is true that the listing process will be more difficult in the future, FWS would naturally tend to commit its resources to the species that face the most danger—those species about to be “developed” into oblivion.

But there are other considerations that outweigh these. First, it should be noted that although 200 U.S. species have been listed, only 34 critical habitats have been designated. The economic impact requirement will make critical habitat designation and new species listing more difficult and allow for more local participation. As a result, FWS is likely to find that in this environment it can no longer afford to be so risk-averse in endangered species protection. Second, the two year limit from proposal to final promulgation means that FWS will have to be much more careful about the species it proposes. (At the time of enactment of the 1978 amendments, about 1800 species were proposed for listing; these proposals are now being reviewed.) Experience with other agencies suggests that informal rulemaking procedures often take more than two years to complete.⁴² Third, and probably most important, with the new requirements it will take considerably more agency resources to produce one listing, but the authorized appropriations have not expanded to take into account the increased load.

The Pittston Refinery: Request for an Exemption

The very limited experience since passage of the 1978 amendments tends to support these preceding assertions. Except for the Tellico and Grayrocks Dams, whose consideration by the Endangered Species Committee was mandatory, only one exemption has been sought: the Pittston Refinery in Eastport, Maine. This refinery is subject to the Endangered Species Act because it must obtain an effluent discharge permit from the Environmental Protection Agency (EPA). In December 1978, FWS issued a biological opinion that completion of the

42. *Id.*

project would jeopardize the continued existence of the bald eagle in Maine. EPA accordingly denied the permit. After Pittston applied for an exemption in January 1979, all parties agreed to a 90-day suspension of the exemption process so that another consultation, in search of a compromise, could take place. In May, however, FWS reaffirmed its earlier conclusion, and the review board resumed its processing of the exemption application. Several environmental groups immediately sued to halt the proceedings, claiming that EPA's internal appeals procedure had not been exhausted. Thus Pittston, which had first applied to EPA for a permit in early 1978, still must go through an EPA appeals procedure lasting several months before further action can be taken on its exemption application. This experience is not likely to make developers particularly eager to seek exemptions from the Endangered Species Committee.

FWS also may be anxious to avoid an irresolvable conflict requiring the Endangered Species Committee to convene, because such conflict might lead to the reopening of the issue of endangered species protection in Congress. If the mood of Congress is shifting away from support of environmental protection in favor of economic (and especially energy) development, it is probably not a good time (from the point of view of FWS) for reconsideration of endangered species policy.

The new listing procedures have resulted, through July 1979, in only three new species being added to the endangered species list, and in no new designations of critical habitats. This result allowed FWS to avoid the public hearing and economic impact requirements stipulated by the amendments. Critical habitats were not designated on the grounds that restricting information on the location of the species would protect the species from being taken. That this is no idle concern is evidenced by the experience with the Virginia roundleaf birch, thought to be extinct since 1914, but recently rediscovered.^{4 3} Shortly after its listing as an endangered species, several trees were stolen and others damaged. Even so, one must wonder what kind of protection can be offered to species whose location cannot even be revealed.

CONCLUSIONS

Section 7 of the Endangered Species Act of 1973, designed to protect "critical habitat" of endangered species was effective policy for two reasons. First, it gave preservation of species in a local setting overriding importance. Second, the listing of new species and critical habitat designations was administratively simple enough to allow en-

43. *Furbish Lousewort*, *supra* note 18, at 7.

dangered, but as yet unlisted, species to be nearly as protected from the consequences of development as were previously listed species.

At the same time the act threatened to have a large potential impact on economic development projects, especially water resource projects. A quick survey of the experience with Section 7 suggests, however, that the actual impact was relatively minor, although a small number of important and highly visible cases were affected. To be sure, casual evidence of this sort can be misleading. On the one hand, it is unknown how many projects were altered, delayed, or abandoned in the planning stages as a result of uncertainties regarding the implementation of the Section 7. On the other hand, projects were affected by many regulations besides the Endangered Species Act. A proposed development challenged by Section 7 is likely to be also affected by NEPA, the Wild and Scenic Rivers Act, designation of wilderness areas, or regulations to prevent significant deterioration of air quality, as well as many other regulations. In such cases, to attribute all the costs of regulation to the 1973 Endangered Species Act is obviously misleading.

When the Endangered Species Act was enacted in 1973, potential costs were not an issue. It was only after these costs became evident that the act was amended in 1978. However, little evidence exists to suggest that Congress was motivated by a concern for economic efficiency. Rather it appears Congress was concerned with the distribution of the costs.

The Tellico exemption demonstrates Congress' motivation. With no consideration of the value of the snail darter, a cost-benefit analysis of the Tellico project by the Office of Policy Analysis in the Department of Interior showed that the net benefits of a "river development" alternative almost equaled those of a "reservoir" alternative.⁴⁴ Thereupon the Endangered Species Committee, which had been considering Tellico for an exemption to Section 7, denied the exemption because a reasonable alternative existed. Not long after that, however, Congress exempted Tellico from the requirements of the act, and directed TVA to complete the project.⁴⁵

The most common means of adjusting for distributional effects is through compensation, but, as noted above, compensation does not seem to be an appropriate solution here. Rather, the apparent strategy of Congress was to restrain the effects of the Endangered Species

44. Office of Policy Analysis, Department of Interior, Tellico Dam and Reservoir (report prepared for the Endangered Species Committee, January 1979).

45. See Energy and Water Development Appropriation Act, 1980, Pub. L. No. 96-69, 93 Stat. 449.

Act through procedural means: by providing an appeals process for hard cases and making it more difficult to list species and designate critical habitat. Because such changes do not pinpoint the real conflict, which is the localized costs of habitat conservation, further adjustment of the act can be expected. The Tellico exemption may only be the beginning.