

UNSOOUND ECONOMICS



The Bush Administration's New Strategy
for Undermining the Endangered Species Act

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About NWF

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EXECUTIVE SUMMARY

This report documents the efforts made by the Bush administration to weaken the Endangered Species Act's critical habitat protections for endangered and threatened wildlife. Our review of the complete set of critical habitat designations prepared by the Bush administration shows that only half of the total amount of lands proposed for protection as critical habitat by federal agency biologists were given protection in final critical habitat rules. See Table 1.

on the ground that critical habitat protections are too costly. Between 2001 and 2003, the share of total critical habitat reductions justified using cost-benefit analysis had risen from less than 1 percent to 69 percent. See Figure 1.

This report assembles and summarizes, for the first time, the economic analyses used by the Bush administration in implementing the critical habitat provisions of the Endangered Species Act. Although Section 4(b)(2) of the Act calls for

Box 1: Key Findings

1. The Bush administration has reduced by approximately 50 percent the size of critical habitat areas designated for protection relative to the amounts proposed by federal agency biologists. A growing proportion of these cuts are based on the erroneous conclusion that critical habitat protection is too costly: from less than 1 percent of the acres reduced in 2001 to 69 percent in 2003.
2. In justifying its reduction of critical habitat areas protected, the administration has aggressively suppressed valuable information regarding the benefits to local economies of habitat conservation, even going so far as deleting portions of economic analyses discussing such benefits. This approach is contrary to written Office of Management and Budget policy and generally accepted economic methodology, which calls for the benefits of habitat conservation to be taken into the account along with costs.
3. The administration has exaggerated the costs of critical habitat protection to justify reductions in the size of protected areas. Self-contradictory methods and other flaws in reasoning have consistently led to overstatement of costs.
4. At a time when the administration is cutting funding for Endangered Species Act recovery programs, it is spending substantial funds on economic analyses. Rather than informing policy, these analyses are used selectively to justify a predetermined result — reductions in habitat protection.

Under previous administrations, habitats important to threatened and endangered species were occasionally excluded from critical habitat designations on the ground that they were otherwise protected under habitat conservation plans or similar conservation strategies. The Bush administration is the first to justify such reductions

analysis of economic and other impacts of critical habitat designations, the administration has failed to use generally accepted methods to assess economic benefits and costs of critical habitat. The administration has aggressively suppressed valuable information regarding the benefits to local economies of habitat conservation, even going so

far as deleting portions of economic analyses discussing such benefits. It also has systematically inflated the costs of critical habitat, using self-contradictory methods and other flaws in reasoning.

Overstatement of the costs of critical habitat protection can be found in two areas. First, the administration has included costs of federal endangered species protections not attributable to critical habitat protection. Second, the administration has used questionable methodologies and assumptions that consistently lead to upward bias in cost estimates. For example, in a 2003 case involving 15 California vernal pool species, top administration officials intervened at the last moment to reduce critical habitat protections by over 60 percent from the amount proposed by agency biologists. Five entire counties were removed from protection, despite the fact that the economic analysis found that only one county would incur costs attributable to critical habitat.

New data also reveal that the budgetary cost of completing these economic assessments is substantial, with over 10 percent of the endangered species program budget for listing and critical habitat designation allocated to reports prepared by consultants. Numerous economic practitioners have recommended that economic assessments be undertaken for major regulations expected to cost at least \$100 million annually and that costly analyses be avoided for lesser measures. Such a threshold is also used in the Unfunded Mandates Reform Act of 1995 requiring agencies to use the least costly method of achieving a regulatory objective. No critical habitat proposals in the Bush administration have come close to this threshold, notwithstanding the sources of downward bias on the benefits side and upward bias on the costs side.

Our recommendations for addressing these problems, and for making the economic analysis provisions of the Endangered Species Act work for the benefit of people and wildlife, are set forth at the conclusion of this report.



THE ENDANGERED SPECIES ACT AND CRITICAL HABITAT

The Endangered Species Act represents the last line of defense for species at risk of extinction. Listing a species as endangered or threatened automatically triggers a number of protections, including prohibitions on federal agency actions that jeopardize its survival (the Section 7 jeopardy provision) or that destroy or adversely modify designated critical habitat (the Section 7 adverse modification provision). Section 4 of the ESA requires designation of critical habitat when a species is listed or within one year thereafter. Section 3(5)(A) defines critical habitat as areas that contain physical and biological features determined to be essential to the conservation and ultimate delisting of the species. (Senatore et al. 2003, NRC 1995).

Despite the requirement that it be designated for all listed plants and animals, the vast majority (814 out of 1265) do not have critical habitat. This is a result of various tactics devised by numerous administrations to avoid this responsibility. (Senatore et al. 2003, Sinden 2003). Historically, the primary regulatory tactic for avoiding this responsibility has been to narrowly interpret the meaning of adverse modification of critical habitat, thus making critical habitat regulations appear to be redundant with regulations prohibiting jeopardy to listed species. *Ibid.*

In 2001, this narrow interpretation of adverse modification was deemed illegal by a federal

appellate court. (See discussion of *Sierra Club v. U.S. Fish and Wildlife Service* below.) Around this time the Bush administration began resorting to a



new tool for evading its critical habitat protection responsibilities: Section 4(b)(2) of the Endangered Species Act. Section 4(b)(2) calls on the Secretaries of Interior and Commerce to “consider the economic impact, and any other relevant impacts, of specifying any particular area as critical habitat” (16 U.S.C. § 1533(b)(2)). Areas can be excluded from critical habitat if the benefits of exclusion exceed the benefits of inclusion and as long as excluding habitat does not result in species extinction. *Ibid.*



THE BUSH ADMINISTRATION AND CRITICAL HABITAT

Our new dataset reveals how the Bush administration has used Section 4(b)(2) to reduce the amount of critical habitat. Appendix A provides a listing of all critical habitat designations prepared by the Bush administration to date; we reviewed each of these designations along with all accompanying proposed rules and economic reports. As shown in Table 1, during the period 2001-2003 the amount of critical habitat has been cut roughly in half from the amounts originally proposed by federal wildlife agency biologists.¹ Exclusions based on Section 4(b)(2) have become increasingly important in these reductions, with half of the designations in 2001-2003 including

them.² By contrast, Section 4(b)(2) was used by the Clinton administration just five times in its 56 designations.³ Section 4(b)(2) has emerged as a major tool for limiting habitat protections under the Endangered Species Act.

What is most noteworthy about the Bush administration's reliance on Section 4(b)(2) is that, whereas previous exclusions of habitat areas from critical habitat designations were largely justified due to alternative conservation strategies, the Section 4(b)(2) exclusions are now being justified based upon dubious economic arguments. Indeed, until the arrival of the Bush administration, no habitat area had ever been denied critical habitat

Table 1. Critical Habitat Reductions: 2001-2003

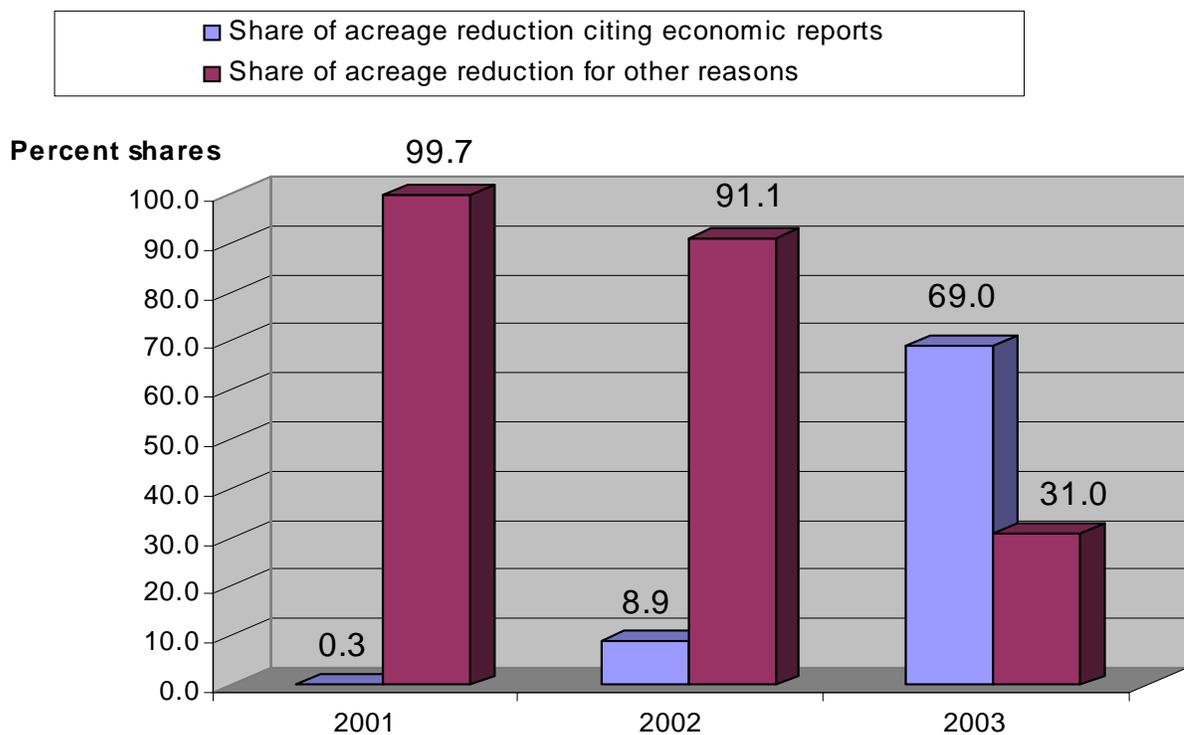
	2001	2002	2003	2001-2003
1. Acres				
Total proposed	77,921,158	540,819	4,500,637	82,962,614
Total reduction	40,513,355	182,496	1,524,909	42,220,761
of which: via 4(b)(2)	18,347,198	34,543	1,146,472	19,528,213
of which: citing Economic reports	114,691	16,170	1,052,200	1,183,062
Percentage reduction	52.0	33.7	33.9	50.9
Share of reduction citing 4(b)(2) (%)	45.3	18.9	75.2	46.3
Share of reduction citing economic reports (%)	0.3	8.9	69.0	2.8
2. Designations				
Number of Designations	14	11	19	44
Number with 4(b)(2) exclusions	8	4	11	23
Economic reports cited (number of designations)	1	2	5	8
3. Percent of Designations with 4(b)(2) Exclusions by Type				
No exclusions	42.9	63.6	42.1	47.7
Military facilities	21.4	18.2	26.3	22.7
Tribal lands	7.1	0.0	10.5	6.8
HCPs	21.4	9.1	15.8	15.9
Parks	0.0	0.0	15.8	6.8
Other	14.3	9.1	42.1	25.0

Note: Designations are allocated to year by effective date of final rule.

protection on the ground that it was too costly to protect. By 2003, the Bush Administration was using economic arguments to justify 69 percent of all acres denied protection. See Figure 1. See also Table 1. The use of economic analyses to justify critical habitat exclusions continues in 2004. A number of recent critical habitat proposals, not yet finalized, include recommendations for substantial reductions based on reported economic costs. Among them are proposals for the San Diego fairy shrimp, the bull trout, the Topeka shiner, and the California red-legged frog.

Unfortunately, the administration has not made clear what type of economic analysis it is using or the criteria by which critical habitat is being reduced for economic reasons. While Box 2 discusses two types of economic analysis that might apply, the Bush administration has instead chosen to ignore potential benefits of critical habitat and inflate costs.

Figure 1. Reasons for Critical Habitat Reductions



Box 2.**ESA Section 4(b)(2), Cost-Benefit Analysis and Cost-Effectiveness Analysis**

There are two basic methods of economic analysis used for government policy evaluation: “cost-effectiveness” analysis (CEA) and “cost-benefit analysis” (CBA). CEA takes a policy objective as given and attempts to identify the least costly means of achieving it. This method is often recommended for severe environmental hazards and irreversible costs (Bingham et al. 1995). For critical habitat, CEA ranks habitat units in terms of their contributions to survival and recovery and compares them with estimated costs. The least costly set of habitat units providing a given level of species protection is then chosen.

CBA is more ambitious than CEA because it seeks an overall evaluation about whether to undertake a policy. Such analyses tend to be more common in circumstances where the costs of not undertaking a policy are less extreme, that is, where opting not to proceed with the policy because it is “too expensive” is an option. CBA only works, however, when both costs and benefits can be quantified using the same metric. Thus, one important requirement for CBA in the context of critical habitat is that all societal costs and benefits of critical habitat protection be expressed monetarily. As is well known, this can be an extremely difficult task, particularly where market prices do not exist for valuation.⁴

General recommendations on best practices have emerged in the literature on CBA and CEA (Arrow et al. 1996, Kopp et al. 1997). Indeed, the OMB has issued several guidance notes on how economic analyses of policies should be conducted (OMB 1996, OMB 2003). An economic analysis under the OMB guidelines should also be consistent with: the 1995 Unfunded Mandates Reform Act, requiring such analyses for actions with costs of at least \$100 million; and the Regulatory Flexibility Act, requiring analysis of potential effects on small businesses. OMB recommendations will be noted where relevant in this white paper.

IGNORING BENEFITS

Over the past several years, the White House Office of Management and Budget (OMB) has developed guidelines for economic analysis of regulations by Federal agencies in response to a Clinton administration executive order and Congressional legislation. The aim is to avoid undue costs of regulations (OMB 1996, OMB 2003). According to the OMB, economic analyses should quantify costs and benefits in monetary terms whenever possible. Where costs and benefits can be quantified, but not in monetary terms, these should also be provided. Even where the effects of regulations cannot be quantified, OMB guidelines direct that they should be discussed qualitatively: “A complete regulatory analysis includes a discussion of non-quantified as well as quantified benefits and costs.... When there are important non-quantified monetary values at stake, you should also identify them in your analysis so policymakers can compare them with the monetary benefits and costs” (OMB 2003, p. 3). Important qualitative information that should be presented

includes “ecological gains, improvements in quality of life, and aesthetic beauty” (OMB 2003, p. 27).

Instead of following this approach, the administration is increasingly resorting to wholesale deletion of any benefits analyses of critical habitat from economic reports, qualitative or quantitative. A review of relevant documents, especially those from late-2003 and 2004, makes this clear. Figure 2 provides the percentage of publicly available reports that contain nothing on benefits, only qualitative discussions, or quantitative as well as qualitative discussions. Figure 3 provides additional indicators of the amount of benefits analysis in publicly available economic reports, including the average number of pages, paragraphs, and references found in them. These figures indicate a dramatic change in the treatment of benefits beginning around 2001 and 2002.

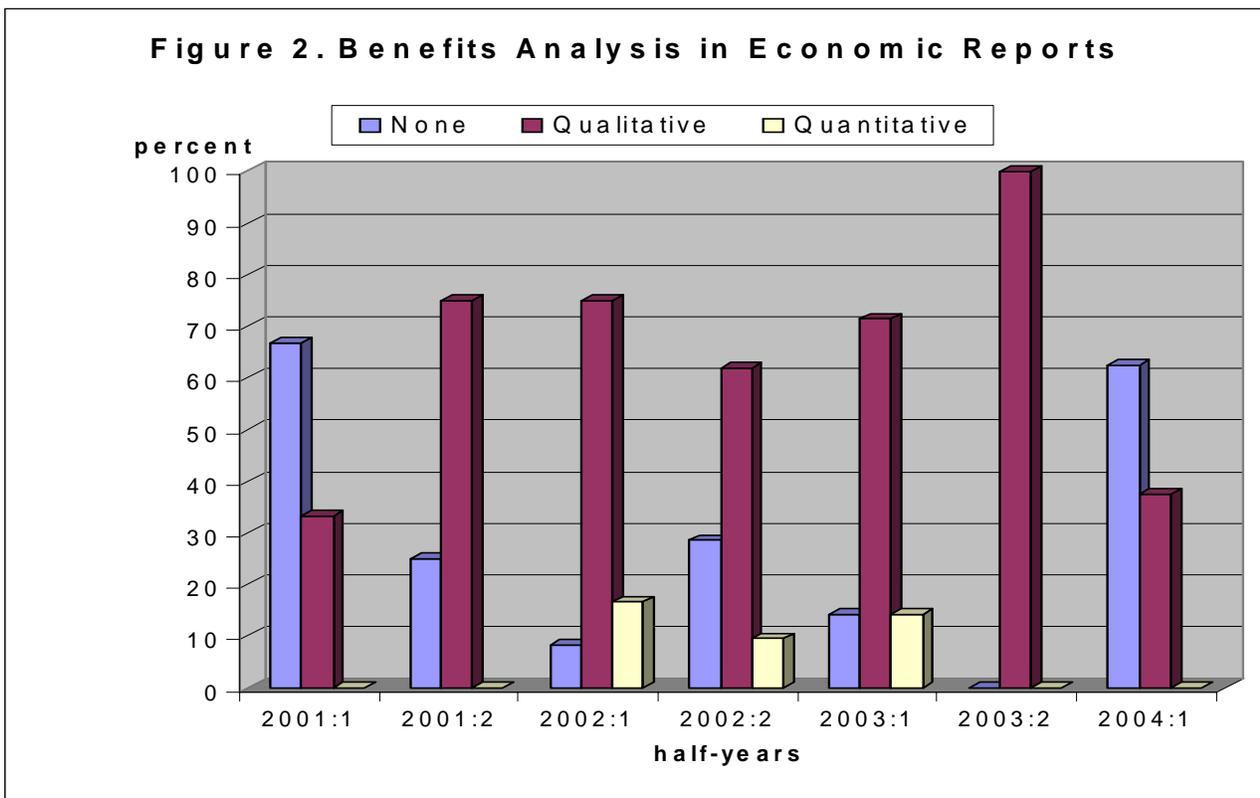
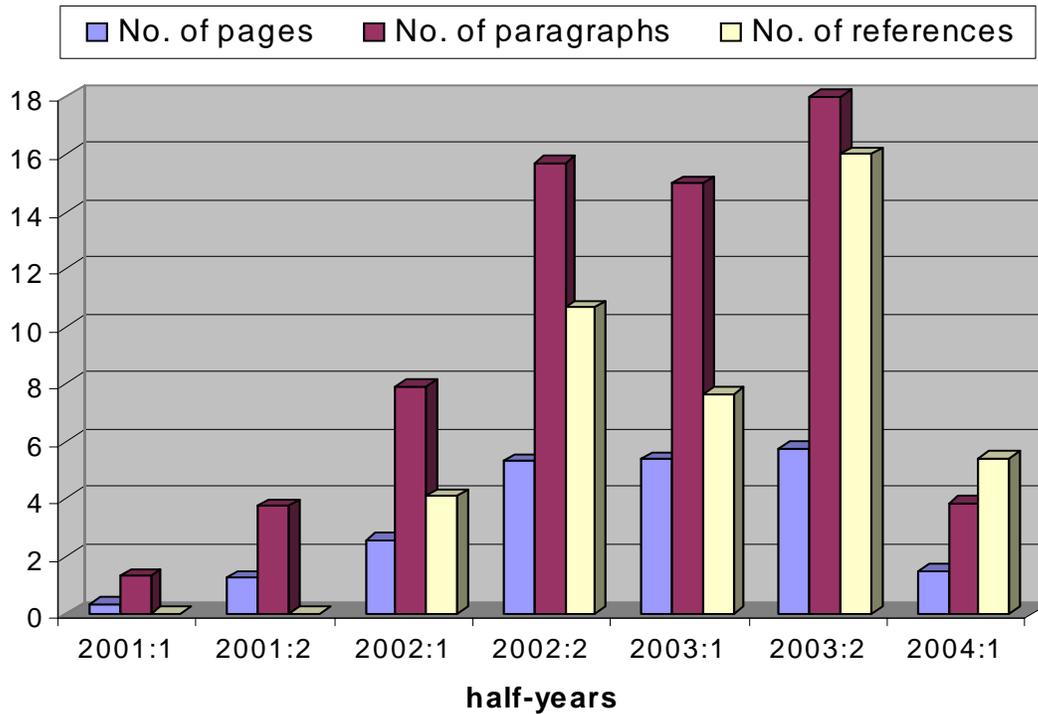


Figure 3. Indicators of Benefits Analysis



Selective Implementation of Court Rulings

Two major appellate court rulings in 2001 (the Fifth Circuit’s ruling in *Sierra Club v. U.S. Fish and Wildlife Service* and the Tenth Circuit’s ruling in *New Mexico Cattle Growers’ Association v. U. S. Fish and Wildlife Service*) have drastically changed the landscape for economic analysis under Section 4(b)(2).⁵ Prior to these cases, federal wildlife agencies typically asserted that, because critical habitat designation was redundant with other Endangered Species Act protections, there can be no significant economic costs or benefits associated with it. Economic analyses typically were not very involved, often containing no quantitative information.

This “redundancy” argument was struck down in 2001 by the Fifth Circuit Court of Appeals in *Sierra Club v. U. S. Fish and Wildlife Service*.

According to the court, critical habitat affords greater protection than other ESA provisions. Unfortunately, the Administration has ignored the *Sierra Club* court’s direction to revise critical habitat regulations to provide protections above and beyond those provided by other ESA provisions.

In *New Mexico Cattle Growers*, the Tenth Circuit reacted to the administration’s continued use of the redundancy argument (and continued refusal to perform meaningful economic analyses) by requiring that economic analyses include all impacts, including those that are attributable co-extensively to causes besides critical habitat protection. The administration could have rendered *New Mexico Cattle Growers* moot (and complied with *Sierra Club*) by issuing new critical habitat regulations setting forth a protective standard above and beyond the protections provided by other ESA provisions. Unfortunately, it continued to falsely assert that critical habitat is

redundant with other endangered species protections, while complying with *New Mexico Cattle Growers* with a new, more expansive approach to economic analyses.

As illustrated in Figures 2 and 3, at first this new approach included an increased emphasis on benefits associated with endangered species protections. Most of the benefits discussions were not extensive, but some (e.g., those involving the cactus ferruginous pygmy-owl and some Hawaiian plants) include good-faith efforts to review



existing literature and discuss a variety of benefits that could accrue from critical habitat, as well as other ESA protections. At the same time, the administration began a more expansive analysis of costs, which will be discussed below.

The administration has since adopted an internally inconsistent approach to cost-benefit analyses. It has responded to the *New Mexico Cattle Growers* ruling by expanding its analyses of costs, while it has deemphasized the benefits of habitat conservation — insisting, contrary to the *Sierra Club* ruling, that critical habitat protections are no different than protections provided by other ESA

provisions. As will be seen, this cherry-picking of legal rulings has increasingly resulted in incoherent, “apples and oranges” comparisons of costs and benefits.

Suppression of Habitat Conservation Benefits Discussions

As also shown in Figures 2 and 3, the Bush administration dramatically deemphasized the benefits of critical habitat protection in 2004. This recent disappearance of benefits analysis in the economic reports is not due to a lack of attention on the part of the contractors hired by the U.S. Fish and Wildlife Service (FWS). Rather, two pieces of evidence show that these sections of the reports are being suppressed by the White House and FWS. The first piece of evidence comes from a March 2004 economic analysis of critical habitat for the threatened bull trout, which was released by FWS without a 57-page section on potential benefits of critical habitat conservation that was originally included in the contractors’ report to the agency. Also in March 2004, a new critical habitat proposal for the Topeka shiner was made based in part on an economic analysis that also completely excluded any discussion of the potential benefits (Industrial Economics, Inc. 2004). According to the OMB, the benefits section of the Topeka shiner report should be excluded entirely:

“The Service is asked to delete all discussion and exhibits in Section 5 and substitute a short summary paragraph as was done in the bull trout economic analysis.... The benefits accruing from designating the critical habitat are not relevant to the policy decision at hand (the decision is how extensive should the habitat be, not whether to designate critical habitat), and the studies cited are not useful (as acknowledged by the Service itself in paragraph 250).” (OMB 2004).

Thus, in the case of the Topeka shiner and possibly

in the case of the bull trout, OMB directed the deletion of the benefits sections. This was done despite OMB's own guidelines to the contrary. Moreover, its reasoning contradicts the administration's approach to analyzing regulatory costs. As noted above, to comply with the *New Mexico Cattle Growers* ruling, the administration has elected to estimate costs associated with all ESA protections, despite the fact that much of those costs will be incurred regardless of whether or not critical habitat is ever designated. Therefore,



simple consistency requires similar treatment on the benefits side.

Because the Topeka shiner benefits analysis was never made available, it is impossible to determine whether it sheds light on the benefits of designating particular areas. An examination of the excised portion of the bull trout analysis does provide information about the distribution of potential sport fishing benefits across regions and states. Further, it provides a discussion of instream flow benefits that are relevant in areas where irrigated agriculture is significant. Nonetheless, it was completely deleted from the report prior to its public release. Appendix B provides a summary of the benefits section of that report.

Another case that has likely been subjected to selective editing by the Bush administration is the March 2004 economic analysis of critical habitat

for the Mexican spotted owl. The lack of benefits discussion in that report contrasts sharply with the extensive discussion of potential benefits of conservation found in the November 2002 analysis of critical habitat for the cactus ferruginous pygmy-owl. What is particularly revealing is that the latter report includes a review of several household valuation studies of the Mexican spotted owl that indicated conservation values of \$50-\$130 per household annually (Industrial Economics, Inc. 2002a, Section 6). In contrast, the 2004 report on Mexican spotted owl critical habitat included no discussion of these or any other studies of benefits.

These cases make it clear that, even when private contractors undertake good-faith efforts based on the best available data to discuss economic benefits of conservation, the administration insists on ignoring them and keeping them from public review. The OMB and FWS justify this approach by maintaining their preference for expressing the benefits of critical habitat in biological terms and weighing the economic costs against them. While the primary benefits of

species conservation under the ESA are indeed

biological, the total neglect of economically-expressed benefits amounts to a selective use of information that can ignore relevant factors. Furthermore, it can lead to errors in the assessment of relative costs. One reason for this is that ancillary effects (indirect spin-off effects of a policy) are being ignored (Box 3, Section 2).



Box 3. Selected Benefits of Critical Habitat	
Value	Functions, Benefits (avoided costs)
1. Benefits Derived from Species	
Direct Nonconsumptive Uses	Recreation, scientific benefits. Genetic information.
Existence values	Value attached to knowledge of existence, independent of use values.
Option value	Retaining option to benefit via direct or indirect future use (risk aversion).
2. Benefits of Habitat Derived Independently of Species Conservation	
Open Space	Amenity values.
Water flow, quality	Drinking water, agriculture, fish, fowl, crustaceans, clams, flood control, water storage, flow regulation, recreation, pollution dilution, sediment trapping, nutrient cycling.
Soil Quality	Moderation of hydrological flows, nutrient cycling, erosion control, soil formation, waste treatment.
Biodiversity	Maintenance of genetic diversity, pollination services, nonuse values, existence values, option values.
Climate	Regulation of atmospheric gases, temperature, precipitation.
Sources: Daily 1997. Costanza et al. 1997. De Groot et al. 2002.	

For example, assume two areas of similar size, A and B, are being considered for critical habitat and that the gross land development costs are equal. However, assume that not developing unit B would maintain the property values of neighboring landowners because of enhanced open space or maintained water quality benefits. Neither benefit derives from preserving unit A. If open space and water benefits are ignored, then based on gross cost of critical habitat the two units are equally ranked. However, open space and water benefits associated with preserving unit B mean that this conclusion is incorrect. Net costs of critical habitat are clearly less for unit B. Hence, ignoring economic benefits of conservation can result not only in overestimation of net costs but can also result in inaccurate cost rankings of potential

habitat. It is, therefore, important to consider these benefits, quantitatively where possible, particularly where they differ between areas. Otherwise, Section 4(b)(2) exclusions may be based on incorrect information.

OMB guidelines stress the need to consider benefits and costs that are not directly related to the objectives of a policy: “Your analysis should look beyond the direct benefits and direct costs of your rulemaking and consider any important ancillary benefits and countervailing risks. An ancillary benefit is a favorable impact of the rule that is typically unrelated or secondary to the statutory purpose of the rulemaking.... Like other benefits and costs, an effort should be made to quantify and monetize ancillary benefits and

countervailing risks. If monetization is not feasible, quantification should be attempted through use of informative physical units. If both monetization and quantification are not feasible, then these issues should be presented as non-quantified benefits and costs.” (OMB 2003, p. 26).

Ancillary or spin-off benefits of critical habitat protections may also occur in areas outside of the species’ occupied range. An excellent example that was ignored in an economic analysis undertaken for FWS is the case of the Rio Grande silvery minnow. Critical habitat was proposed for this species in June 2002 for reaches of the Middle and Lower Rio Grande River, as well as part of the Pecos River. The main effect reported in the economic analysis is the value of lost agricultural output (primarily alfalfa) associated with anticipated water diversions from irrigation along the middle Rio Grande in central New Mexico (Industrial Economics, Inc. 2002b).

This analysis overestimates the total social costs of critical habitat and indeed critical habitat may provide a net social benefit. The analysis examines only the effects of water diversions from agriculture in region surrounding the Middle Rio Grande between Cochiti Reservoir and Elephant Butte Reservoir, ignoring broader regional effects of water flow changes on the Rio Grande. A recent study considered the further effects of increased water flows further downstream as a result of the diversions (Ward and Booker 2003). This analysis concludes that modest costs to agricultural, municipal, and industrial users in the region near Albuquerque would be more than offset by benefits from increased water flows for users in the El Paso region. Even when the analysis is limited to agricultural costs and benefits, the gains to farmers in southern New Mexico more than offset the costs in the central part of the state. This example highlights the need to consider the indirect effects of policies, as recommended in OMB guidelines (OMB 2003, p. 26).



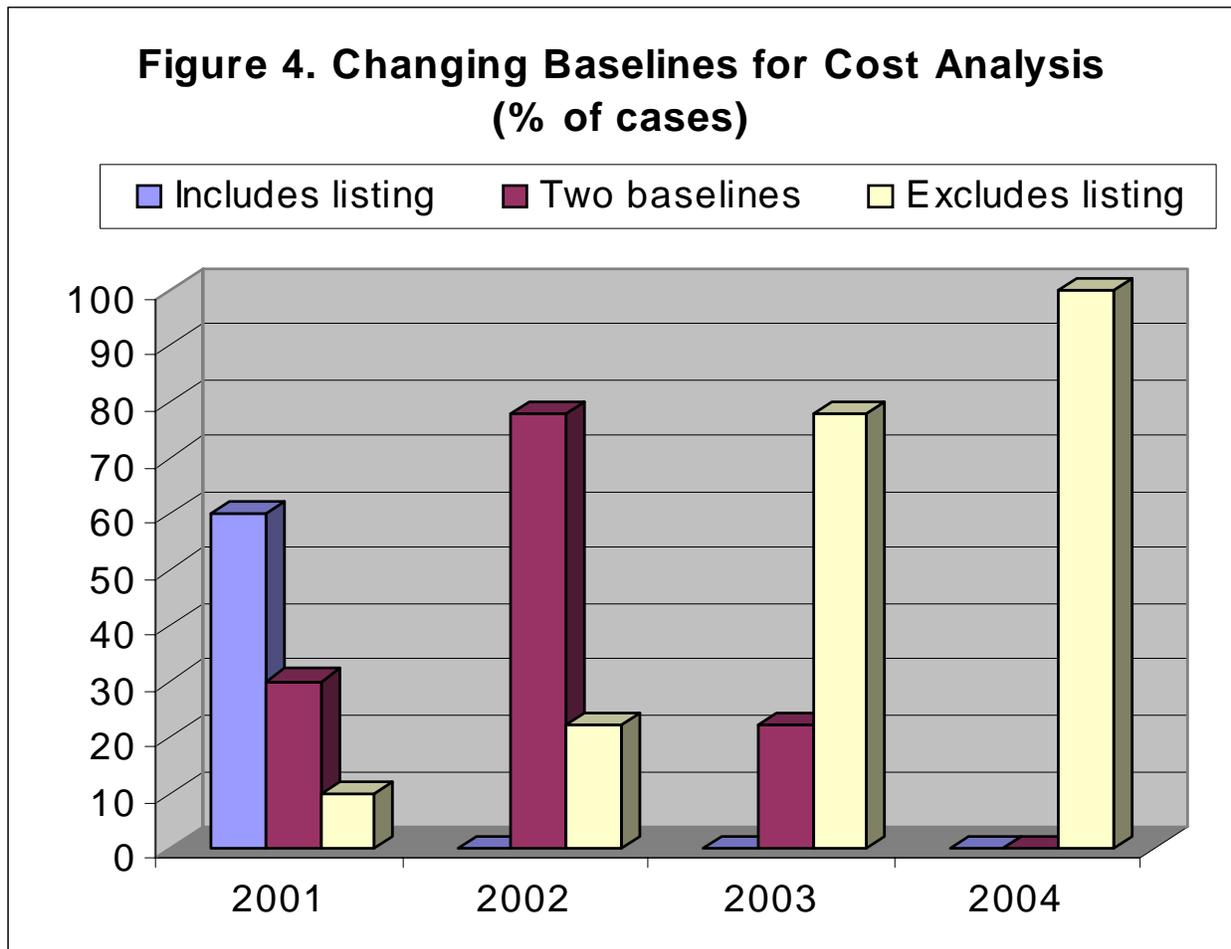
INFLATING COSTS

While ignoring potential economic benefits of habitat conservation, the Bush administration has repeatedly exaggerated the costs of protecting critical habitat. This has been done by emphasizing the overall costs associated with the ESA, as opposed to the incremental costs associated with critical habitat designation. In several prominent cases, other improper methods and assumptions employed in estimating costs have resulted in further inflation of costs.

Figure 4 gives the percentage of cases in each year that have employed three different baselines from which costs have been estimated. It reveals the administration's confusing and inappropriate

responses to the 2001 *New Mexico Cattle Growers* ruling. Prior to that ruling, the economic reports considered the degree to which there would be incremental economic effects of critical habitat designation above those associated with other ESA protections; that is, the baseline from which costs were considered included activities associated with species listing. This pre-*New Mexico Cattle Growers* approach is referred to in Figure 4 by the bars labeled "includes listing."

The administration's initial response to the *New Mexico Cattle Growers* court ruling, reflected in late 2001, and especially in 2002, was the consideration of two baselines. The administration



essentially carried out two analyses. It continued to estimate the incremental costs of critical habitat, using the protections afforded at listing, and prior to critical habitat designation, as the baseline. In addition, it analyzed the overall costs of ESA protections, interpreting *New Mexico Cattle Growers as requiring analysis of costs* that are “co-extensive” with critical habitat protection. In Figure 4, this response is represented by the bars labeled “two baselines.”

Beginning in 2003 and continuing into 2004, the administration began to report only the costs associated with total ESA protections, thus eliminating from consideration the effects of critical habitat itself. See Figure 4 (“excludes listing” bars).

By analyzing total ESA costs, the administration has imposed unnecessary delays and budgetary burdens on the wildlife agencies. Moreover, it has created a confusing picture about the relative costs and benefits of critical habitat protections.⁶

The focus on total ESA costs has two distorting effects. First, it systematically inflates costs, since only a subset of ESA costs are expected to be attributable to critical habitat. Second, because the policy being considered is whether to designate specific areas as critical habitat and not whether to provide ESA protections to species, reporting the overall ESA costs is essentially irrelevant to decision-making. Table 1 and Figure 4, however, make clear that the administration has increasingly sought to justify Section 4(b)(2) exclusions entirely based on overall ESA costs. Thus, the administration is increasingly using irrelevant information to justify reductions in critical habitat.

Furthermore, these overall ESA costs are being compared to the biological benefits of critical habitat alone, not the benefits of ESA overall. Hence, FWS is systematically engaging in “apples and oranges” comparisons. The 2004 critical habitat proposal for the Topeka shiner and the 2003 final critical habitat designation for 15

California vernal pool species are two examples of this.

In addition to the move toward exclusive reliance on total ESA costs, illustrated in Figure 4, some recent cases have involved excessive cost estimates because of other questionable methods and because other factors mitigating the estimated costs of the critical habitat proposals have been ignored. This has already been shown for the Rio Grande silvery minnow, where other relevant downstream effects of water diversions to conserve the species were ignored.

Two other important recent cases buttress the impression of inflated cost estimates. The first concerns critical habitat for 15 vernal pool species in California. The second is the most recent critical habitat proposal for the Mexican spotted owl. It should be noted, however, that in most analyses of critical habitat the only effects estimated are the direct compliance costs incurred by agencies and third parties potentially affected. These costs are estimated on the basis of estimated costs per consultation depending on complexity together with costs associated with specific project modifications.

California Vernal Pool Species

In September 2003, the Bush administration reduced the amount of proposed critical habitat for 15 vernal pool species of crustaceans and plants in California by over 60 percent. This reduction was based largely on an economic report estimating costs of approximately \$1.4 billion over 20 years. However, the costs cited to justify the reductions in critical habitat protections are those associated with overall ESA protections, not those specifically due to critical habitat designation. Moreover, the methods used resulted in substantially inflated costs.

The final report, issued in July 2003, estimated costs an order of magnitude greater than the original draft report issued in October 2002, which reported 20-year costs of around \$130 million.

Two-thirds of the reported cost increase was due to a new effort to estimate broader real estate market effects of critical habitat designation. However, most of those estimates consist of double-counting of previously estimated costs stemming from Army Corps of Engineers Section 404 permitting under the Clean Water Act (Appendix C). These real estate development permits are expected to involve on-site set-asides for sensitive vernal pool habitat as well as off-site mitigation and/or restoration



associated with ESA protections. Both the original 2002 draft report and the final 2003 report estimated the costs of these permits in terms of reductions in the value of land available for real estate development as a result of set-asides and restoration projects. However, the final 2003 report adds to these costs a set of estimates of consumer surplus losses associated with increases in land prices in certain land-constrained counties. As explained in Appendix C, however, the result is a double-counting of the Section 404 permitting costs. Total ESA costs are about two-thirds higher in the final economic report than they should be.

Despite this flaw (and several other sources of cost overestimation acknowledged in the analyses), the final economic report was used late in the rule-

making process to exclude five counties (Butte, Madera, Merced, Solano, and Sacramento) from critical habitat for the vernal pool species. Documents obtained by *Endangered Species & Wetlands Report* through the Freedom of Information Act reveal that Julie MacDonald, Deputy Assistant Secretary of the Interior, undertook a rudimentary last-day review of the economic report and excluded these counties with Assistant Interior Secretary Craig Manson's approval (*Endangered Species & Wetlands Report*, May 2004, pp. 1-2).

In her e-mail to Manson, MacDonald cited comments from the Small Business Administration and other agencies to justify dropping these five counties. However, other documents reveal that SBA and OMB only recommended one of the counties, Solano, for exclusion from critical habitat because it was the only county of the five for which any costs are attributed to critical habitat as opposed to total ESA protections, which would be incurred anyway (Box 4). Nonetheless, without providing any explanation, MacDonald and Manson agreed to exclude the five counties. Defenders of Wildlife and the Butte County Environmental Council have sued FWS over this designation, maintaining that the decision was arbitrary and capricious.



Box 4. Ranking Costs and Vernal Pool Crustacean and Plant Species by County

Out of 36 counties considered as potential critical habitat for 15 listed vernal pool species, the administration excluded five from its final designation rule. Using data supplied by FWS’s economic consultant, we rank these five counties among the 36 counties in terms of total ESA costs, costs attributable to critical habitat, and the number of listed vernal pool species found in them:

	Total cost Rank	CH cost Rank	Species no. Rank
Butte	4	last (\$0)	4 (8 species)
Madera	7	last (\$0)	2 (9 species)
Merced	3	last (\$0)	1 (10 species)
Solano	2	1 (\$141 million)	6 (6 species)
Sacramento	1	last (\$0)	10 (5 species)

This ranking shows that the Bush administration denied critical habitat protection to vernal pool species in counties with the highest estimated level of total ESA costs. Yet four of the five counties did not have any estimated costs associated with critical habitat protection. Further, these counties were excluded from protection despite their apparent importance to the species. Three of the top four counties in terms of number of vernal pool species are among the five excluded. This suggests that the administration focused on irrelevant economic considerations and ignored important biological information.

Sources: Industrial Economics, Inc. 2003b.

Mexican Spotted Owl

Another notable case involves the Mexican spotted owl. Soon after taking office, the Bush administration ordered that major swaths of Forest Service land occupied by 90% of the remaining owls be excluded from millions of hectares of critical habitat proposed by the Clinton administration. The rationale given was that Forest Service plans met the needs of owl conservation and so no “special management considerations” were required. Therefore, the FWS reasoned, the Forest Service land did not meet the definition of critical habitat under ESA Section 3(5)(A). This

was challenged in *Center for Biological Diversity et al. v. Norton*, with the court determining that this interpretation of critical habitat was “nonsensical” and ran counter to three previous court rulings. In response, the Department of the Interior has sought repeated extensions of critical habitat designation deadlines, finally requesting an indefinite extension in August 2003 arguing that it had insufficient funds to comply with the mandate. This request was rejected and as a result, the case was reopened for comment in November 2003 with the previous final rule excluding Forest Service land remaining in effect in the interim. Meanwhile, the Bush administration has recently approved an oil and natural gas leasing plan in

Utah that includes Mexican spotted owl habitat (Eilperin 2004).

As already indicated, the most recent publicly available economic analysis of critical habitat for the Mexican spotted owl released in March 2004 contains no information on potential benefits of protection (Industrial Economics, Inc. 2004). Total



ESA costs for the owl are estimated at \$9.2-\$30.9 million in present value terms over ten years, with about 40 percent of these incurred by livestock grazers on Bureau of Land Management and Forest Service land (the largest single affected group). The losses to livestock grazing take the form of reduced permit values, administrative costs, and potential project modification costs. To estimate these costs, the report uses: a survey of livestock owners; estimates of areas in critical habitat where consultations over the Mexican spotted owl have occurred in the past; and a range of 10-50% in permit value losses in spotted owl critical habitat. Using estimated permit values of approximately \$5 per animal unit month (AUM) on BLM and Forest Service land, total lost permit values are estimated

at \$2.5-\$12.6 million over ten years.

This analysis assumes that grazing activity on public land is economically efficient. As is well known, however, grazing on Federal land is a subsidized activity (Moskowitz and Romaniello 2002). The current Federal grazing fee is under \$1.50 per AUM per year compared with the \$5 assumed in the economic report. Private grazing fees are on average about \$13 per AUM in 11 western states and about \$7.50 per AUM in Arizona.⁷ Furthermore, Federal appropriations for range management by both the Forest Service and BLM are substantially greater than amounts collected in grazing fees at the subsidized rates. This subsidy has two implications. First, too much of society's resources are allocated to livestock grazing on public land. Second, lost permit values reflecting reduced grazing due to Mexican spotted owl conservation is one way to reduce this inefficiency. Unfortunately, this reduction in the social costs of grazing subsidies is not even discussed in the economic report much less quantified. Hence, the costs reported overestimate the true costs of ESA protections to society. Taking into account of the value of environmental damages from public lands grazing would reduce these reported costs further.

THE BUDGETARY BURDEN OF ESTIMATING COSTS

In response to the *New Mexico Cattle Growers* ruling, the Bush Administration has repealed a number of critical habitat designations in order to redo the economic analyses. These have included: Pacific salmon and steelhead; arroyo toad; tidewater goby; California red-legged frog; Riverside fairy shrimp; cactus ferruginous pygmy-owl; southwestern willow flycatcher; Alameda whipsnake; Arkansas river shiner; San Diego fairy shrimp; and the coastal California gnatcatcher. Several of these economic analyses have already been redone. If current trends persist, the remaining analyses can be expected to ignore benefits of critical habitat, inflate costs, and engage in apples and oranges comparisons.

The administration has been willing to redo these economic reports in spite of FWS's own admission of their increasing costs.⁸ Newly acquired data shows the rising budgetary burden of economic analyses (Table 2). The budgetary costs of

undertaking these economic analyses have risen to over ten percent of the endangered species listing and critical habitat budget over Fiscal 2002-2004. Although FY 2004 has not been completed so the costs of those reports are only available through April 1st, it is already over 10 percent of the annual listing appropriation for the year. Table 2 also indicates that, over the period FY2002-FY2004, the average cost of these economic reports has been over \$75,000 apiece and the median has been \$60,000. By far the largest outlier in terms of the budgetary costs of estimating costs is the bull trout report, which cost over \$450,000. This is a remarkable waste given that one-quarter of the report on benefits was suppressed and ignored. The average cost of the economic analyses per case has been rising as well. Even excluding the bull trout report as an outlier indicates that the cost per case of the economic reports has about doubled.

Table 2. Budget Costs of Estimating Costs of Critical Habitat

	Fiscal Years			Total
	2002	2003	2004	2002-2004
Total	1,062,792	1,355,641	1,274,976	3,693,409
Cases	20	19	9	48
Cost per case	\$53,140	\$71,350	\$141,664	\$76,946
less bull trout			102,756	
ESA listing budgets	\$9,000,000	\$9,018,000	\$12,135,000	\$30,153,000
% of listing budget 1/	11.8	15.0	10.5	12.2
<u>Memorandum</u>				
Mean	\$76,946			
Median	\$60,000			
Maximum (bull trout)	\$452,931			

1/ Several critical habitat cases not included in the database have not been included in the figures.

The result of including them would be a marginal increase in percentages.

Source: FWS data (unpublished).

With well over 10 percent of the budget for listing and critical habitat being allocated to economic assessments, it is particularly important that they take into account all relevant factors using proper methods and that they be used appropriately. All relevant factors, including the benefits of critical



habitat, should be considered in Section 4(b)(2) decision-making. Care must also be taken to ensure that decision-making is based on relevant comparisons of benefits and costs. Current critical habitat policy fails on both of these counts.

Beyond the need to use economic assessments properly, there is a need to conserve extremely limited endangered species program resources. Since, FY 2002, in 13 instances the budget costs of these economic reports exceeded a year of average estimated total ESA costs reported in them. In three cases, the cost of the report was greater than the ten-year ESA costs reported in them.

Numerous economic practitioners have recommended that economic assessments be undertaken for major regulations expected to cost more than \$100 million annually and that costly analyses be avoided for lesser measures (Arrow

et al. 1996, p. 5). Moreover, the Unfunded Mandates Reform Act of 1995 uses an expected annual cost of \$100 million as a threshold requiring agencies to use the least costly method of achieving a regulatory objective. The data over the past three-and-a-half years indicate that no critical habitat proposals have come close to this threshold. Furthermore, in many cases, these economic reports have not been cited in final critical habitat designations except to note the insignificance of their likely costs.

One way to avoid wasted resources on unnecessary studies while abiding by the Section 4(b)(2) requirement that economic impacts be considered is to undertake an inexpensive pre-analysis to determine whether local or regional market prices or quantities may be affected by a critical habitat proposal. In the vast majority of cases, this will not be the case and

further analysis would not be necessary. In a few cases, further analysis, including assessment of both benefits and costs, would be required. Such a two-step assessment method may substantially reduce the budgetary burden of this requirement, freeing resources urgently needed for other essential ESA activities.



RECOMMENDATIONS

In 1999, FWS announced its intention to develop new guidance on critical habitat, including strengthening and streamlining the economic analyses. However, it has not followed through. The U.S. General Accounting Office has twice urged FWS to expedite the process since then (GAO 2002, GAO 2003). Several recommendations follow from this review of the role of economic analyses in critical habitat decision-making. These ideas should be aired through public discussion and debate leading to new guidance clarifying the role of critical habitat:

- ESA regulations defining critical habitat modification must be revised to comply with the Fifth Circuit's ruling in *Sierra Club* and to ensure that sufficient habitat is protected to provide for the recovery of threatened and endangered species.
- Where extensive economic analyses pursuant to Section 4(b)(2) are necessary, they should consider all costs and benefits of critical habitat protection, including economic and biological impacts. They should take into account benefits that are regionally or area-specific, quantitatively where possible, both to make a more accurate assessment of overall net costs and to provide rankings by proposed critical habitat area.
- Immediate steps must be taken to end the misuse of economics to overstate the costs of critical habitat protection. New guidance is needed to preclude the consideration of overall ESA costs to justify denial of critical habitat protection.
- A rational explanation must accompany all decisions to exclude habitat areas from critical habitat designations.

- New guidance must be developed to avoid wasting limited agency resources on unnecessary economic analysis. A pre-analysis of each critical habitat proposal could be conducted to determine whether its net economic effects would be large-scale. (Large-scale could be defined as exceeding \$100 million.) If the effects of a proposal are not large-scale, the wildlife agencies could be directed to perform a short-form economic analysis. Costly economic analysis should be reserved for large-scale proposals.

Economic analysis should be used for the purpose of deciding which habitat areas can help achieve recovery in the most cost-effective manner. Section 4(b)(2) should not be used as a tool to reduce critical habitat protections below the amount needed to achieve the ESA's goal of species recovery.

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Appendix A. Critical Habitat Designations Reviewed

Cases	FWS Region	States
Appalachian elktoe	Southeast	North Carolina, Tennessee
Arkansas River shiner	Southwest	Kansas, New Mexico, Oklahoma, Texas
Arroyo (=arroyo southwestern) toad	Pacific	California
Bay checkerspot butterfly	Pacific	California
Big Island Plants (47 of 58 species)	Pacific	Hawaii
Bighorn sheep	Pacific	California
Blackburn's sphinx moth	Pacific	Hawaii
Braun's rock-cress	Southeast	Kentucky, Tennessee
Bull Trout	Mountain- Prairie	Idaho, Montana, Oregon, Washington
Cactus ferruginous pygmy-owl	Southwest	Arizona
California red-legged frog	Pacific	California
California red-legged frog	Pacific	California
Carolina heelsplitter	Southeast	North Carolina, South Carolina
Coastal California gnatcatcher	Pacific	California
Coastal California gnatcatcher	Pacific	California
Desert yellowhead	Mountain- Prairie	Wyoming
Gulf sturgeon	Southeast	Alabama, Florida, Louisiana, Mississippi
Kauai arthropods	Pacific	Hawaii
Keck's Checker-mallow	Pacific	California
Kneeland Prairie penny-cress	Pacific	California
La Graciosa thistle	Pacific	California
Lanai plants	Pacific	Hawaii
Maui and Kahoolawe plants (61 of 70)	Pacific	Hawaii
Mexican spotted owl	Southwest	Arizona, Colorado, New Mexico, Utah
Molokai Plants (42 of 51)	Pacific	Hawaii
Monterey spineflower	Pacific	California
Morro shoulderband (=Banded dune) snail	Pacific	California
Newcomb's snail	Pacific	Hawaii
Oahu Elepaio	Alaska	Alaska
Otay tarplant	Pacific	California
Peirson's milk-vetch	Pacific	California
Piping Plover, wintering	Multi-Region	Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas
Piping Plover, Northern Great Plains	Mountain- Prairie	Minnesota, Montana, Nebraska, North Dakota, South Dakota
Piping Plover, Great Lakes	Mountain- Prairie	Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, New York, Wisconsin
Preble's meadow jumping mouse	Mountain- Prairie	Wyoming, Colorado
Purple amole	Pacific	California

Appendix A, continued. Critical Habitat Designations Reviewed

Cases	FWS Region	States
Quino checkerspot butterfly	Pacific	California
Rio Grande silvery minnow	Southwest	New Mexico, Texas
Riverside fairy shrimp	Pacific	California
Robust (incl. Scotts Valley) spineflower	Pacific	California
San Bernardino Merriam's kangaroo rat	Pacific	California
San Diego fairy shrimp	Pacific	California
Santa Cruz tarplant	Pacific	California
Spectacled eider	Alaska	Alaska
Spruce-fir moss spider	Southeast	North Carolina, Tennessee
Steller's Eider	Alaska	Alaska
Topeka shiner	Mountain-Prairie	Iowa, Kansas, Nebraska, North Dakota, South Dakota
Ventura Marsh Milk-vetch	Pacific	California
Vernal Pool Crustaceans and Plants	Pacific	California
Wenatchee Mountains checkermallow	Pacific	Washington
White sturgeon	Mountain	Idaho
Zayante band-winged grasshopper	Pacific	California
11 Mussels	Southeast	Alabama, Georgia, Mississippi, Tennessee
2 California larkspurs	Pacific	California
2 California Plants	Pacific	California
2 California plants (Lompoc yerba santa, Gaviota tarplant)	Pacific	California
2 Mammals, 4 Birds on Guam	Pacific	Guam
3 California plants	Pacific	California
5 Carbonate Plants	Pacific	California
5 Mussels	Southeast	Alabama, Kentucky, Mississippi, Tennessee, Virginia
5 of 6 Plant species from NW Hawaiian Islands	Pacific	Hawaii
83 of 95 Plants on Kauai & Niihau	Pacific	Hawaii
9 Bexar County Invertebrates	Southwest	Texas
99 Oahu Plants	Pacific	Hawaii

Appendix B. The Potential Benefits of Critical Habitat for the Bull Trout

A summary of the excluded benefits section of the bull trout critical habitat report is provided in Appendix Box 1. Of major importance is the potential value of rejuvenated bull trout fisheries. Appendix Table 1 provides a range of estimates of annual bull trout sport fishing values depending on the extent of species recovery after 25 years. Depending on the rate chosen to discount future benefits, the annual value in today's dollars of a potential future bull trout sport fishery ranges from just over \$100,000 to about \$6.5 million. Assuming a fully recovered sport fishery and using historical data on angler activity, a recovered fishery could be most beneficial to Idaho and Montana, where annual benefits could range from about \$600,000 to over \$5.5 million under optimistic species recovery assumptions.

The benefits section of the original draft bull trout report had extensive, responsible and restrained discussions of other benefits as well, including the value that people place on knowing the species continues to exist and recover (Appendix Box 1). Although the report discussed several quantitative valuation studies of this type of benefit, no attempt was made to extrapolate estimates from those studies to the bull trout. Benefits that could be expected from protection of habitat and ecosystems from economic activities, such as extensive forestry and grazing practices on Federal lands, include improved water quality, the protection afforded to other fisheries, such as highly valued salmonids, and recreational benefits of instream flows. Instream flow benefits estimates from the academic literature are discussed and shown to vary widely depending on the recreational benefit and waterway being analyzed. However, a qualitative comparison of such benefits with estimated costs of water diversion from irrigated agriculture in the Yakima River Basin (estimated at up to \$960,000 annually) provides an overall picture of the trade-offs involved with respect to changes in water flow. This type of analysis is fully consistent with OMB guidelines directing agencies to analyze spin-off, or indirect, effects of regulatory actions in addition to direct effects (OMB 2003: 26).

Appendix Box 1. The Benefits of Critical Habitat the Bush Administration Does Not Want You to See: Bull Trout

(1) Direct Use Value – Sport Fishing	Bull trout sport fisheries declined as a result of logging, roadbuilding, dams, irrigation diversion and overexploitation. Benefits estimates based on conservative and optimistic recovery scenarios. The vast majority of benefits are expected in the Columbia River Basin with \$2-\$6 million in annualized benefits (assuming a 3% discount rate and no benefits for the first 25 years).
(2) Existence Value	13 contingent valuation studies of threatened or endangered fish species surveyed. One study asked Montana fishermen what they would contribute to maintain summer water flows for arctic grayling and cutthroat trout. Average one-time willingness to pay estimated at \$20-\$43 per person. No benefits transfer to bull trout undertaken.
(3) Benefits to Other Fish Species	Over 60% of bull trout stream habitat is shared with anadromous fish (e.g., salmon and steelhead), only about 4% of lake habitat shared with these species. Timber and grazing reductions in critical habitat could reduce sediments in anadromous spawning sites. Cold water streams and lakes in Clark Fork, Flathead, and Kootenai River Basins in Western Montana have salmonid fisheries valued by anglers at about \$37 million annually.
(4) Reduced Drinking Water Costs	Better timber and grazing practices may reduce sediment loads, improve water quality, and reduce water treatment costs. Logging in western Oregon may have necessitated \$1.6 million investment for water treatment. High turbidity flood prior to the investment resulted \$3.6-\$4.7 million in commercial damage.
(5) Irrigation and Instream Flows (for Recreation and Other Fisheries)	Improving duration of low season flows likely to benefit agriculture and recreation. Eleven studies of instream flow benefits from conservation are discussed. Values range widely and primarily reflect recreational fishing values. One study estimated a fishing value of \$30 per acre foot of water flow for the Columbia River Basin.

Notes: The first two benefits are associated directly with the species being protected. The remaining benefits are secondarily associated with habitat protection. Seen another way, they are the costs associated with development beyond its threat to the bull trout itself. Project modifications likely to lead to benefits include those associated with dam operations (e.g. flow changes, fish passageways), timber and roads (e.g. road engineering changes, harvest reductions, streamside buffers), grazing (reduced grazing, fencing, monitoring), and mining (contaminant reductions, stream restoration). The Northwest Power Planning Council spends over \$20 million annually for resident fish maintenance. A settlement of a case involving compensation to the Confederated Salish and Kootenai Tribes for natural resource destruction by mining and milling operations resulted in \$1.5 million for bull trout recovery projects, as well as about \$6.5 million for wetland and riparian area restoration.

Source: Bioeconomics, Inc. 2004.

Appendix Table 1. Potential for Bull Trout Sport Fishing 1/

	Low Estimates 2/		High Estimates 3/		Rankings	
	\$17/day	\$50/day	\$17/day	\$50/day	Low	High
					Estimates	Estimates
<u>A. 7% discount rate</u>						
Klamath	\$0	\$0	\$10,000	\$40,000		
Columbia	\$110,000	\$390,000	\$680,000	\$2,480,000		
Idaho	\$54,212	\$192,206	\$280,355	\$1,022,463	1	2
Montana	\$20,085	\$71,210	\$296,629	\$1,081,813	3	1
Oregon	\$20,533	\$72,798	\$60,894	\$222,110	2	3
Washington	\$15,170	\$53,785	\$42,122	\$153,614	4	4
<u>B. 3% discount rate</u>						
Klamath	\$0	\$0	\$20,000	\$100,000		
Columbia	\$280,000	\$1,000,000	\$1,770,000	\$6,440,000		
Idaho	\$137,995	\$492,836	\$729,747	\$2,655,106	1	2
Montana	\$51,126	\$182,590	\$772,109	\$2,809,225	3	1
Oregon	\$52,265	\$186,662	\$158,504	\$576,769	2	3
Washington	\$38,615	\$137,911	\$109,640	\$398,900	4	4

1/ Present annual equivalent values assume a 25-year recovery period with subsequent benefits discounted backward at 3% and 7% discount rates. State distribution of benefits calculated by author and not in the report and are likely less reliable for the low estimates.

2/ Low estimates based only on recovery of currently strong populations.

3/ High estimates assume 100% recovery.

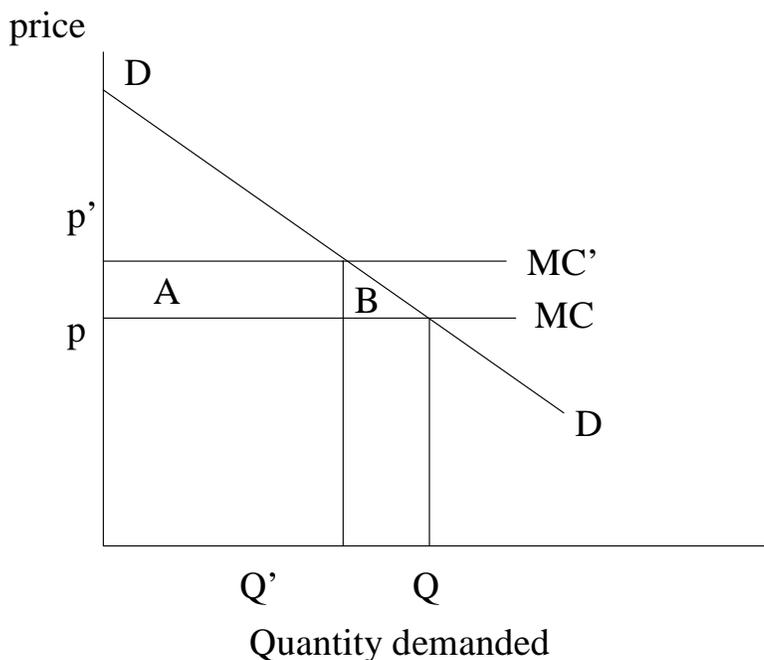
Source: Bioeconomics, Inc. 2004. Draft Economic Analysis of Critical Habitat for the Bull Trout.
Missoula, MT: Bioeconomics, Inc.

Appendix C. Consumer and Efficiency Costs of California Vernal Pool Critical Habitat

The main costs associated with critical habitat designation for 15 vernal pool species of crustaceans and plants in California are expected to be those associated with Army Corps of Engineers permitting under Section 404 of the Clean Water Act. The final economic report (Industrial Economics, Inc. 2003b) includes two main cost elements in its analysis. Each is based on estimates of the overlap between critical habitat in the vernal pool proposal and the amount of that area that can reasonably be expected to face real estate development pressure in the absence of vernal pool species protection. It is assumed that additional on-site set-asides for conservation purposes and/or off-site mitigation or restoration requirements that add to the cost of developing real estate will be required in these areas. The costs associated with these requirements are expressed as land value losses.

Unlike the initial 2002 report, the final 2003 report includes additional cost estimates associated with overall real estate price effects in Solano and Sacramento Counties. These costs are referred to as consumer surplus costs, or efficiency costs. The Figure illustrates how these costs are estimated (Industrial Economics, Inc. 2003b: 46-50).

Figure . Consumer Surplus and Efficiency Losses



The downward-sloping nature of the demand function, DD, indicates that for any positive quantity demanded there are consumers that are willing to, but do not, pay a higher price because market competition tends to establish a uniform price. This is consumer surplus and is equal to the area under the demand function down to the market price. The final report assumes a perfectly elastic supply, or marginal cost, function, MC. To estimate the consumer surplus, or efficiency, costs of critical habitat, the report assumes that the marginal cost function shifts upward from MC to MC'. The consumer surplus loss is then equal to the area A+B. The final report estimates this loss and adds it to other real estate costs associated with set-asides and mitigation/restoration.

However, adding areas A+B to the other costs results in double-counting because the costs represented by A are those associated with set-asides and mitigation/restoration projects had already been estimated. Assuming real estate markets in Solano and Sacramento Counties are affected, the efficiency costs that should have been estimated and added are those equal to area B (since an estimate of A had already been made). A rough estimate of the consequences of this error is an inflation of total costs of vernal pool habitat by about two-thirds assuming the efficiency costs are equal to \$863 million less the \$573 million in project modification costs (Industrial Economics, Inc. 2003b: Table ES-1).



ENDNOTES

¹ Critical habitat proposals are followed by an extensive public comment period during which analyses of economic impacts are undertaken, technical refinements made, and peer reviews obtained. The final designation may also reflect political considerations, as will be seen. The data reported in this paper are by critical habitat designation, which is the basis upon which economic assessments of costs and benefits are made. In numerous instances, these designations include more than one species and there can be considerable habitat overlap between species. To minimize multiple-counting of the same areas, only total area for each designation is reported in Table 1. There may remain some overlap in critical habitat areas across designations, however. Reporting critical habitat on a species-by-species basis, as has been done in Center for Biological Diversity (2003), results in critical habitat reductions of approximately 55% for 2001-2003. The average percentage reduction in critical habitat per species during this period was almost 80%. In most cases, the data in this paper were obtained from original documentation. In cases where it was necessary to convert stream or river lengths to acres, data are from the Center for Biological Diversity.

² In 2001, the share of total critical habitat reductions justified through Section 4(b)(2) was about 24 percent. By 2003, this share had increased to 75 percent of total critical habitat reductions.

³ The Clinton administration also sometimes invoked Section 3(5)(A)'s definition of critical habitat, arguing that the existence of management plans, such as habitat conservation plans and integrated natural resource management plans, eliminate the need to designate certain areas as critical habitat. When a court ruled that Section 3(5)(A) cannot be relied upon to justify the substitution of management plans for critical habitat designations, the Bush administration began to utilize Section 4(b)(2)'s "other relevant impacts" language to justify this substitution. See Senatore et al. (2003). The Bush administration also has invoked Section 4(b)(2)'s "other relevant impacts" language to deny protection to certain habitat areas for a variety of other non-economic reasons such as national security or the desire to maintain successful conservation partnerships. *Ibid.*

⁴ Relevant components of value include goods and services for which separate prices do not exist but that may affect prices of marketed commodities, as, for example where open space enhances the value of a home. Certain ecosystem services may positively affect produced and consumed goods and services. For example, intact ecosystems can improve water quality and flow rates that enhance drinking water quality and recreational experiences. For discussion of these types of valuation issues see Goulder and Kennedy 1997; Farber et al. 2002; De Groot et al. 2002. Other values that are difficult to quantify include existence and option values. See Perman et al. 1996; Diamond and Hausman 1994; Hanemann 1994.

⁵ *Sierra Club v. U.S. Fish and Wildlife Service*, 245 F.3d 434 (5th Cir. 2001). *New Mexico Cattle Growers Association v. U.S. Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

⁶ As discussed earlier in this report, neither of these approaches is justified by the need to comply with the *New Mexico Cattle Growers* ruling. Compliance could be achieved simply by clarifying which protections are uniquely afforded by the ESA's critical habitat provisions and then analyzing the marginal costs and benefits of those protections.

⁷ As noted in Moskowitz and Romaniello (2002), the fact that some ranchers sublease permitted lands to others at higher rates further indicates that public rangelands are subsidized by the Federal government.

⁸ For example, the FWS budgetary discussion for fiscal year 2004 states: "The cost of designating critical habitat, particularly those costs associated with economic analyses, continues to increase. We have reached the point where the cost for some economic analysis is equal to or greater than costs associated with preparing the rest of the designation." (DOI 2003, p. 65).

PHOTO CREDITS

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