

ADDENDUM TO THE DRAFT ECONOMIC IMPACT ANALYSIS OF PROPOSED CRITICAL HABITAT FOR THE MOLOKA‘I PLANTS

1. INTRODUCTION

In April 2002, the U.S. Fish and Wildlife Service (the Service) proposed designation of critical habitat under the Endangered Species Act of 1973, as amended (the Act) for the Moloka‘i Plants (the Plants). This proposal encompassed approximately 43,516 acres of land on the island of Moloka‘i in Hawai‘i. Because the Act requires an economic analysis of the critical habitat designation, the Service released a “Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Moloka‘i” (hereafter the DEA) for public review and comment in August 2002.¹

The primary purpose of this Addendum is to update the DEA. As such, the Addendum revisits the assumptions and analytic conclusions presented in the DEA in light of new information obtained since the DEA was published. It also addresses issues raised in public comments on the DEA. The DEA as revised and updated by this Addendum constitutes the final economic analysis for this proposal.

2. EXCLUDED AND REDUCED UNITS

As a result of new information and for reasons other than economic impacts, the Service has indicated that it intends to remove one unit (Unit E2) and modify eight of the proposed units (Units A1, A2, B1, C, D, E1, F and G) in the final critical habitat designation for the Plants. As such, the total acreage would be reduced from 43,532 acres to 24,333 acres, or a decrease of 19,199 acres (44 percent). Table Add-1 presents the proposed rule acreage, the acreage as modified, and the change between the two for each of the critical habitat units.²

The preamble to the final rule explains the Service’s revisions to the proposed critical habitat designation. Henceforth, the proposed designation addressed in this addendum refers to the designation with the above modifications.

¹ Copies of the *Draft Economic Impact Analysis of Proposed Critical Habitat for Threatened and Endangered Plants on Moloka‘i* are available from the Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, Honolulu, Hawai‘i.

² The Service has indicated that the final rule for the critical habitat will feature remapped boundaries that reflect the removal of these areas from the designation (Memorandum to Chief, Branch of Listing, November 6, 2002).

Table Add-1: Moloka‘i Plants Revised Critical Habitat Acreage

Item	Proposed Rule Acres	Addendum Acres	Change
Unit Acreage			
A1	1,167	167	1,000
A2	3,786	325	3,461
B1	5,384	2,246	3,138
B2	50	10	40
C	11,138	10,930	208
D	1,153	592	561
E1	315	305	10
E2	821	-	821
F	12,247	9,436	2,811
G	7,471	321	7,150
Land Ownership*			
Federal	22	3	19
State	22,596	12,249	10,347
County	7	-	7
Private Owners	20,892	12,068	8,824
State/County Roads	14	2	12
State Land Use Districts*			
Conservation	28,552	21,725	6,827
Agricultural	14,786	2,608	12,178
Urban	178	-	178
Total Acres	43,532	24,333	19,199

* Land ownership and State land use district acreage totals may not equal total acres due to digital mapping discrepancies between TMK data and USGS coastline or due to rounding.

3. METHODOLOGY

The analysis in the DEA incorporated two baselines: one which addressed the impact of critical habitat designation that may be 'attributable co-extensively' to the listing of the species and one which produced a conservative estimate of the incremental impact of the critical habitat designation itself.

This Addendum utilizes one baseline and analyzes the impacts of critical habitat designation that may be attributable co-extensively to the listing of the species. Because of the potential uncertainty about the benefits and economic costs resulting solely from critical habitat designations, the Service believes that it is reasonable to estimate the effects of the designation utilizing this approach to avoid understating potential economic impacts. It is important to note that the inclusion of impacts attributable co-extensively to the listing does not convert the economic analysis into a tool to be considered in the context of a listing decision.

4. DIRECT COSTS

As noted above, the Service indicates that it intends to remove one and modify eight of the units. These changes affect some of the direct costs estimated in the DEA. As such, this section revisits the costs affected and derives new costs according to the intended modifications. The DEA costs, the revised Addendum costs, and an explanation for the changes are presented in Table Add-2 at the end of the Addendum.

4.a. Management of Game Hunting

Chapter VI, Section 3.a. of the DEA presents estimates of future consultation and project modification costs associated with game-management projects. The DEA's estimate of section 7-related project modification costs for game-management projects on Moloka'i was based on an assumption that past project modification costs were limited to areas considered *occupied*. Therefore, the DEA multiplied its estimate of project modification costs in the State hunting units by a multiplier that reflected how much larger the total critical habitat is than the *occupied* habitat. However, public comment questioned the estimate for project modifications costs, noting that past project modifications were not limited to areas considered *occupied* by the Plants since ungulates roam throughout an area. The Addendum revisits this part of the analysis to address this comment and to reflect the conclusion that the project modification costs do not need to be projected out to add *unoccupied* habitat, because it is already included.

Anticipated Project Modification Cost:

- Total Section 7 Costs: \$4,400 to \$37,000

The DEA makes the assumption that the cost of past project modifications only incorporates the portions of the hunting units that overlap with the *occupied* proposed critical habitat. This assumption was questioned during public comment on the basis that prior project modifications covered areas considered *unoccupied* by the Plants in recognition of the mobility of ungulates. Specifically, public comment noted that the prior consultation already modified the State's proposed game mammal program to address potential impacts to habitat everywhere on the island, including *occupied* and *unoccupied* habitat and areas inside and outside of critical habitat designation, based on the understanding that increasing game mammal populations in one location where the Plants are

not present may cause those mammals to move to areas where the Plants are present and cause destruction.

Upon further review of past consultations and past project modifications, the estimate for project modification costs has been revised to reflect that project modification costs are unlikely to increase as a result of critical habitat designation. Past project modifications were proposed without regard to whether an activity was within an *occupied* or *unoccupied* area. It is anticipated that future project modification costs will remain similar to 2001 costs (\$110,000). Over a ten-year period, these costs of Moloka'i would be between \$4,400 and \$37,000 ($\$110,000 \times 2$ (estimated number of consultations over the next ten years) $\times 2\%$ (based on percentage of State hunting land on Moloka'i); $\$110,000 \times 2$ (estimated number of consultations over the next ten years) $\times 1/6$ (based on equal allocation of funding to the six main islands)).

4.b. National Parks – Kalaupapa Landfill Relocation

Chapter VI, Section 3.b.(2) of the DEA indicates that Kalaupapa National Historical Park intends to relocate its existing landfill within the next ten years. The DEA discusses the potential impacts the proposed critical habitat may have on the relocation. However, as noted above, the Service indicates that it intends to substantially reduce Units A2 and B1 for biological reasons. The reduction would remove the area suitable for relocation of a landfill from the final designation. Therefore, all section 7-related costs estimated for this project in the DEA are no longer expected.

4.c. Conservation Projects – Ilio Point

Chapter VI, Section 3.c.(3) of the DEA indicates that the State Department of Land and Natural Resources (DLNR) may do some future restoration work at Ilio Point with the assistance of funding from the Service and discusses potential consultation costs associated with that future restoration. However, as noted above, the Service indicates that it intends to modify Unit A1 to exclude this area from the final designation for biological reasons. Therefore, all section 7-related costs estimated for this project in the DEA are no longer expected.

4.d. Agriculture and Ranching Operations – Pu'u o Hoku Ranch

Chapter VI, Section 3.d.(1) of the DEA presents estimates of costs relating to Pu'u o Hoku Ranch's participation in Natural Resource Conservation Service (NRCS) conservation programs in Units E1 and E2. However, as noted above, the Service indicates that it intends to remove Unit E2 and reduce Unit E1 by ten acres in the final designation for biological reasons. Because the activities associated with the conservation programs overlapped with Unit E2, costs of consultation and project modification related to these activities in the DEA are no longer expected. Because there have been minimal modifications to Unit E1, no changes were made to the DEA's estimate of costs associated with reinitiation relating to the existing Safe Harbor Agreement.

4.e. Agriculture and Ranching Operations – Other Ranching Operations

Chapter VI, Section 3.d.(2) of the DEA presents estimates of costs associated with consultation regarding NRCS conservation projects. However, as a result of the unit modifications indicated by the Service, the total acreage within the Agricultural District would change from 14,786 acres to 2,608 acres, a reduction of 82 percent. The final designation would capture an exceedingly small fraction (two percent) of the total amount of Agricultural District land on Moloka'i, and not all of this land is in active agricultural use. Finally, as noted in the DEA, competition for NRCS

funding is strong. Thus, it is no longer considered likely that any NRCS funded projects will occur within critical habitat. If any projects do occur within the critical habitat, it is likely that they would not be NRCS funded, and therefore would not be subject to section 7 consultation, and thus would not be directly affected by this designation. As a result, all section 7 related costs relating to agriculture and ranching operations have been removed from this analysis.

4.f. Residential Development

Chapter VI, Section 3.e. of the DEA concluded that no residential development within the proposed critical habitat was likely in the next ten years. During public comment, the State Department of Hawaiian Home Lands (DHHL) opposed critical habitat designation of the Kapaakea subdivision in Units F and G, contending that it would adversely impact hundreds of future beneficiaries intending to construct homes or farms. As noted above, the Service indicates that it intends to modify Units F and G, and as a result, the total amount of DHHL land within critical habitat would be reduced by two-thirds, from approximately 3,336 acres to 1,049 acres. Moreover, the DHHL land remaining in critical habitat is located *mauka* and eastward of the existing Kapaakea Homestead, and most of the land is adjacent to the Moloka'i Forest Reserve. There are no publicly available plans for development of this area within the next ten years, nor has DHHL indicated that development of this area within the next ten years is likely. Thus, no section 7 costs for residential development by Native Hawaiian beneficiaries within Kapaakea have been included in this Addendum.

4.g. Water Systems

Chapter VI, Section 3.g. of the DEA presents estimates of section 7 costs associated with water systems, specifically the State-owned Moloka'i Irrigation System and the privately-owned Moloka'i Ranch water system. During public comment, information was received regarding the possibility of groundwater exploration in Units F and G by the Maui County Department of Water Supply (DWS).

Additional information from DWS indicated that the only DWS project currently planned on Moloka'i that could be affected by the proposed critical habitat designation was a proposed backup well, located above Unit G, and an access road traversing Unit G to that well. As noted above, the Service indicates that it intends to modify Unit G by reducing the size of the unit from 7,471 acres to 321 acres. These remaining 321 acres are located to the east of the general area planned for the access road. Thus, because the access road for the proposed backup well is not likely to be sited in critical habitat, as modified, no section 7 costs for DWS water projects have been included in this Addendum.

4.h. Communications Facilities

Chapter VI, Section 3.h. of the DEA presents estimates of costs associated with consultation regarding communications facilities. With the intended reduction in acreage proposed for critical habitat designation, it is possible that no communications facilities will be developed in the critical habitat in the next ten years. Thus, the Addendum revises the estimated number of projects within the critical habitat to a range of zero to one to reflect this possibility and adjusts the costs accordingly.

Consultation Cost:

- Total Section 7 Costs: \$0 to \$9,100

The DEA estimates that one communications facility will be built in the critical habitat within the next ten years. Due to the indicated reduction in the acreage proposed for critical habitat designation, it is possible that no communications facilities will be developed in the critical habitat in the next ten years. Thus, the above estimate is based on (1) zero to one consultations in the next ten years, (2) the low cost (from Table VI-I of the DEA) of a consultation with a Federal agency as the applicant and/or with the involvement of a non-Federal applicant, and (3) the cost of a biological survey, based on a ten-acre open or forested site with easy to medium access. Currently, the Service consults on all communications towers to review impacts to listed birds. The Low cost was selected from Table VI-I of the DEA to reflect the section 7 consultation cost attributable to the additional level of effort required for the Plants. Thus, while the total cost of a consultation regarding communication towers could be higher due to issues relating to impact on birds, this analysis includes an estimate only of the incremental cost attributable to section 7 consultation for the Plants.

5. INDIRECT COSTS

5.a. Indirect Impacts on Game Management

Chapter VI, Section 4.b. of the DEA analyzes indirect impacts on hunting conditioned on a change in game management. Assuming, for the sake of illustration, that the State Department of Land and Natural Resources (DLNR) builds fences to exclude game ungulates from the proposed critical habitat units within State-managed hunting units, the DEA analyzes the impacts this may have on hunting. However, the Service indicates that it intends to remove portions of the State-managed hunting units from the final critical habitat for biological reasons. This would result in a decrease in the acreage of critical habitat that overlaps with the hunting units from approximately 14,500 acres to approximately 9,000 acres. These overlapping areas represent about 47 percent of the total State-managed hunting units on Moloka'i. In addition, data from the Service's 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation has become available since the publication of the DEA. As such, the following are the revised estimates of impacts on hunting.

Economic Activity Associated with Hunting on Moloka'i

As discussed in the DEA, one issue surrounding the proposed critical habitat designation concerns the management of game-mammal populations (i.e., feral pigs, goats, and deer) and the potential loss of valued hunting lands. The concern does not extend to game birds, however, since the Service currently believes that these birds and the hunting of them do not have a significant adverse impact on listed species or their habitats.

Appendix VI-A, Section 3 of the DEA provides an estimate of the economic activity associated with game-mammal hunting on Moloka'i. As noted above, since the publication of the DEA, new information has become available. Using this new information, the 2001 estimated economic activity supported by just game-mammal hunting on Moloka'i amounted to about \$317,000 in direct sales, \$563,000 in total direct and indirect sales, ten jobs, and \$185,000 in income. Appendix VI-A of the DEA provides more information on the estimation of the economic activity associated with hunting on Moloka'i.

Economic Activity Associated with Hunting in Critical Habitat

If enclosure fences are built to exclude ungulates from critical habitat, approximately 9,000 acres (i.e., 47 percent of State-managed hunting units on Moloka'i) would be eliminated from

available hunting areas. If about half of those who hunt game mammals on the affected lands were to give up hunting, then hunting activity on Moloka'i could drop by about 23.5 percent (half of 47 percent). The other half of those who hunt in the affected areas might switch to other hunting areas or to hunting game birds.

The drop in hunting activity translates into a decrease in annual economic activity related to hunting on Moloka'i of about \$74,000 in direct sales (23.5 percent of \$317,000); \$132,000 in total direct and indirect sales (23.5 percent of \$563,000); two jobs (23.5 percent of ten jobs); and \$43,000 in income (23.5 percent of \$185,000). However, the decrease in expenditures by the displaced hunters would probably be spent on other recreational activities, goods and services, so these figures are likely to overstate the economic costs.

Value of Hunting to Hunters on Moloka'i

In addition to the change in economic activity discussed above, a reduction in hunting activity in critical habitat would also result in a loss in value or benefit to hunters (consumers' surplus). To determine the value of this loss, Appendix VI-A, Section 4 of the DEA provides estimates of the value of hunting to hunters on Moloka'i. As noted above, since the publication of the DEA, new information has become available. Using this new information, the Statewide value of all hunting for 2001 is estimated at \$7.9 million, based on (1) the assumption that hunters value their experience at \$25 per day; and (2) they hunted a total of 316,000 hunter-days that year. Based on the number of trips spent hunting game mammals (approximately 70 percent) and the number of hunters on Moloka'i (approximately three percent of the Statewide total), the value of just game hunting amounted to about \$165,000 for Moloka'i ($\$7.9 \text{ million} \times 70\% \times 3\%$). These figures on the value of game hunting should be interpreted as order-of-magnitude estimates, not precise estimates. Appendix VI-A of the DEA includes additional information on the value of hunting to hunters.

Value of Hunting to Hunters in Critical Habitat

Under the revised assumptions, the loss to consumers' surplus for hunters is estimated at \$39,000 annually (23.5 percent of the current \$165,000 in surplus value). But partially offsetting this loss to hunters would be benefits derived from recreational activities that replace game mammal hunting.

5.b. Conservation Management

Chapter VI, Section 4.c. of the DEA discusses the concern that some landowners will be required to alter the management of their lands that fall within critical habitat to assure the survival and conservation of the listed species. While there is no existing obligation to proactively manage lands to control threats, there is an undetermined probability that a State or Federal court could mandate conservation management.

In order to illustrate the potential costs if a State or Federal court did mandate conservation management, the DEA provides an estimate of the costs of conservation management based on the number of acres of critical habitat in the mountains and a management cost of \$30 to \$80 per acre per year. Approximately 95 percent of the revised designation is in mountainous areas. Thus, an illustrative cost of conservation management for the revised designation, if mandated, ranges from \$695,000 to \$1.85 million per year ($24,333 \times 95\% \times \30 and $24,333 \times 95\% \times \80).

5.c. State Redistricting of Land

Chapter VI, Section 4.e. of the DEA discusses the concern that land in the Agricultural District in critical habitat will be redistricted into the Conservation District. While the probability of redistricting is determined to be small, the DEA presents an estimate of the economic costs of redistricting.

The DEA focuses on potential impacts of redistricting to the privately owned Agricultural land in Units A1, A2, E1, E2, F and G, and estimates that approximately 9,000 privately owned acres are affected. The Service indicates that it intends to remove all of the privately owned Agricultural land in Units B1 and G, and all of Unit E2, from the final designation of critical habitat for biological reasons. Approximately 167 acres in Unit A1, 23 acres in Unit A2, 305 acres in Unit E1, and 1,650 acres in Unit F (a total of 2,145 acres) are the only privately owned lands that would remain in the designation that are not in the Conservation District.

The DEA states that as a result of redistricting, the land values on Moloka'i could drop between \$1,000 per acre for remote agricultural land to \$75,000 per acre for land suitable for development. The DEA estimated the total possible reduction in value at \$9 million to \$675 million, assuming redistricting of all Agricultural land were to occur and noting that values in the lower end of the range were more likely due to the remote nature of most of the privately owned Agricultural land proposed for designation.

The intended revised designation would significantly reduce the amount of privately owned Agricultural land as well as the amount of Agricultural land actively used in agriculture. In the revised designation, approximately 1,430 acres in Unit F are either managed as a recreational preserve or as part of the East Moloka'i Watershed Partnership. Redistricting these lands to the Conservation District is not likely to interfere with the use of the land or significantly reduce its economic value. The remaining privately owned land (715 acres) is considered remote Agricultural land. Therefore, utilizing the value from the lower end of the range, an estimate of the total drop in property value should redistricting of all privately owned Agricultural land occur would be \$715,000 (715 x \$1,000).

If redistricting causes a reduction in the amount of grazing in critical habitat, the loss in economic activity would be similar to the land rents generated by grazing, which are typically less than \$10 per year. However, very little, if any, of the remaining privately owned land in the Agricultural District is used for grazing. Thus, the potential loss is expected to be minimal.

The DEA also estimated that affected landowners could spend approximately \$50,000 contesting redistricting. The intended modification of the proposed critical habitat would reduce the number of private landowners potentially affected by redistricting to six. Thus, total costs of contesting redistricting could reach \$300,000 (\$50,000 x 6).

5.d. State and County Development Approvals

Chapter VI, Section 4.f. of the DEA discusses the concern that critical habitat will significantly affect State and county development approvals, even when there is no Federal involvement. Because there are no specific development plans for Moloka'i within the proposed critical habitat over the next ten years, the costs associated with State and county development approvals were expected to be minimal.

The DEA also mentions the possibility that certain projects and activities will require additional State and county environmental review as a result of critical habitat. The discussion

focuses on Hawai'i's Environmental Impact Statement Law, which states, depending on the amount of environmental impact, certain projects will require the preparation of an Environmental Assessment (EA), or an more extensive Environmental Impact Statement (EIS). There is a concern that any project that requires an EA due to baseline environmental regulations will have to prepare a more expensive EIS were it designated as critical habitat.

Only one known project that may require an EA remains in the proposed critical habitat. This is the planned widening of the highway that crosses Unit E1. If an EIS, rather than an EA, is required for this project due to the designation of critical habitat, the additional cost of an EIS over and above the cost of an EA could be \$25,000 to \$75,000, as estimated in the DEA. No other projects requiring an EA are currently anticipated within the intended revised critical habitat designation.

5.e. Reduced Property Values

Chapter VI, Section 4.e. of the DEA indicates that uncertainties about the impacts of the proposed critical habitat designation can cause a temporary reduction in land value that will continue until clear and correct information is distributed. These concerns involve lands in the Agricultural District. The DEA noted that the worst-case scenario – and one that is not expected over the long term because uncertainties about the implications of the designation are likely to dissipate over time – would be a perception among potential buyers that the land should be valued as if it were subject to the same restrictions as land in the Conservation District. As noted above, the total drop in property value should redistricting of all privately owned Agricultural land occur could be \$715,000 (715 x \$1,000).

5.g. Costs to Investigate Implications of Critical Habitat

Chapter VI, Section 4.f. of the DEA indicates that landowners may want to learn how the designation may affect (1) the use of their land (either through restrictions or new obligations), and (2) the value of their land. Public comment noted that uncertainties about the exclusion of “unmapped holes” could result in higher investigative costs for landowners to evaluate the impact of critical habitat. Since the commenter did not provide an alternative estimate of time or cost incurred in order to investigate implications of critical habitat, this Addendum conservatively doubles the number of hours that the DEA estimated the landowner and/or his attorneys or professional staff would spend on investigating the issues. At the same time, the number of affected landowners has decreased to 19 with the intended modifications to the critical habitat. Thus, the Addendum revisits this section as follows:

- Total Section 7 Costs: \$73,500 to \$218,500

This cost is based on the following assumptions: (1) 15 to 19 landowners will investigate the implications of critical habitat; (2) the landowner and/or his attorneys or professional staff will spend about 30 to 50 hours on the investigation at rates of \$150 to \$200 per hour; and (3) Service staff will spend four to ten hours at \$100 to \$150 per hour responding to inquiries from this landowner.

Public comment questioned whether the indirect cost of investigating the implications of critical habitat should be considered a sunk cost of the critical habitat designation process rather than a potential future cost of a final designation. While some landowners may expend time and money to investigate the implications of critical habitat on their land during the designation process, many landowners may not do so until after final designation is complete. Thus, the DEA and this Addendum conservatively treat these costs as a cost attributable to final designation.

6. SECTION 7-RELATED BENEFITS

6.a. Regional Economic Activity Generated by Conservation Management

Chapter VI, Section 6 of the DEA discusses the potential direct and indirect benefits that could result from critical habitat. Specifically, Chapter VI, Section 6.b. discusses the economic activity generated by conservation management. As noted above, if mandated by a court order, the annual conservation management costs for the proposed critical habitat would range from \$695,000 to \$1.85 million. These expenditures would generate \$1.5 million to \$3.9 million in direct and indirect sales in Hawai‘i, and would support about 23 to 61 jobs in Hawai‘i. However, the economic activity supported by these expenditures on conservation management may or may not represent an expansion of Hawai‘i’s economy, depending upon how the expenditures are financed (e.g. by new Federal funding sources, or by State funds intended for another purpose). Chapter VI, Section 6.b.(1) of the DEA provides further explanation of this issue.

6.b. Social Welfare Benefits

There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop (1978, 1980), Brookshire and Eubanks (1983), Boyle and Bishop (1986), Hageman (1985), Samples et al. (1986), Stoll and Johnson (1984)). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

It is not feasible, however, to fully describe and accurately quantify these benefits in the specific context of the proposed critical habitat for the Plants, because 1) no quantified data on the value of the Moloka‘i species exists; and 2) the Service is unable to provide specific data on the change in the quality of the ecosystem and the species as a result of the designation (for example, how many fewer ungulates will roam into the critical habitat, how many fewer invasive plants will be introduced as a result, and therefore how many more of the Plants will be present in the area). The discussion presented in the DEA and in this Addendum provides examples of potential benefits, which derive primarily from the listing of the species, based on information obtained in the course of developing the economic analysis. It is not intended to provide a complete analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat designation in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

6.c. Benefits Associated with Endangered Species Preservation and Improvements to the Ecosystem

A commenter suggested that the critical habitat designation for the Plants will help protect intact native ecosystems, including native forest in the watershed. In turn, the commenter suggests that this protection will promote groundwater recharge, keep water pure and clean and reduce erosion onto the reefs. The commenter also suggested that species preservation results in social welfare benefit and that these benefits should be quantified. The DEA already discusses these potential benefits. However, the DEA also indicates that these benefits are not quantified due to lack of information available on (1) quantified data on the value of the Moloka‘i species; and (2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation.

When primary research is not possible, economists frequently rely on the method of benefits transfer. Benefits transfer involves application of results of existing valuation studies to a new policy question.³ Two core principles of defensible benefits transfer are (1) the use of studies that apply acceptable techniques to generate welfare values, and (2) similarity between the good being valued in the literature and the good being valued in the policy context to which the transfer is being made (i.e., the protection afforded the Plants by critical habitat). As noted above, no known studies exist on quantified data on the value of the Plants or the change in the quality of the ecosystem and the species as a result of the designation. Therefore, applying results of existing valuation studies on non-plants to the Moloka'i Plants is not feasible.

6.d. UH Study on the Value of Environmental Services Provided by the Ko'olau Mountains

A commenter suggested that a 1999 analysis by the University of Hawai'i (UH) economists on the total value of environmental service provided by O'ahu's Ko'olau Mountains be used as a model for estimating the value of the environmental benefits provided by critical habitat (Kaiser, et al). This document was, in fact, used in the DEA as a resource document for concepts, and for identifying documents that report the original research on certain subjects.

However, the UH study has limited applicability for valuing the benefits of the proposed critical habitat designation for the Plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of O'ahu versus the value of the more limited benefits provided by the proposed critical habitat for the Plants on the island of Moloka'i. Consistent with its purpose, the UH study provides no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the Plants critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on O'ahu – an island which is more than twice the size of Moloka'i but has a population of more than 115 times that of Moloka'i. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the man-made Ala War Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin so must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with most of the Plants critical habitat. Most of the Plants critical habitat units are in mountainous ranges with steep slopes and difficult access and on coastal cliffs.

7. PUBLIC COMMENTS

Some reviewers commented that the DEA did not address or did not adequately consider a variety of costs and benefits that they believe could occur due to the implementation of section 7 for the Plants. Many of these possible costs were, in fact, considered and some were addressed in the DEA. In many cases, however, potential costs were purposely not addressed in the DEA because they are not expected to occur. In other cases, it is impossible for them to occur. In still other cases, the concerns no longer have substance given the Service's intended modifications to the proposed

³ For more discussion of benefits transfer, see Environmental Protection Agency, *Guidelines for Preparing Economic Analyses* (EPA 240-R-00-003), September 2000.

critical habitat. Finally, in some cases, the comments provided new information and costs were modified above in Section 4 of this Addendum.

To clarify further, the following addresses specific comments raised during the public comment period that relate to economic impact of the proposed designation but are not expected to occur and/or have already been addressed by the DEA or this Addendum.

7.a. Comment (Impact on Local Economy)

A commenter stated that the DEA must take into account the unique local circumstances of land ownership and limited economic base of Moloka'i, which are especially susceptible to detrimental impacts of regulations.

Response: Chapter VI, Section 5.b. of the DEA addresses the limited economic base of Moloka'i by examining potential impacts on small entities (small businesses, small organizations, and small government jurisdictions) under the Regulatory Flexibility Act (RFA) (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996). The DEA concludes that a significant economic impact on a substantial number of small entities will not result from the proposed critical habitat designation.

In addition, the Service's indicates that it intends to remove or reduce some of the units due to biological reasons. This would result in a reduction in the total direct costs from approximately \$109,070 to \$804,750 to \$54,470 to \$269,150. As revised, these costs represent, in the worst-case, approximately 0.2% of the total personal income of Moloka'i in 2000. Under these circumstances, it is not anticipated that the designation of critical habitat will significantly affect the unique local circumstances and limited economic base of Moloka'i.

7.b. Comment (Underestimate of Economic Impact)

A commenter stated that the Service must analyze all economic impacts of critical habitat designation, not merely those impacts that are a 'but for' result of the critical habitat designation. The commenter further stated that the DEA does not adequately analyze the full scope of economic impacts, but focuses primarily on section 7(a)(2) of the Act, which requires consultation with the Service when Federal permits, funding or other Federal action is required and says that other sections of the Act are outside the scope of this economic analysis. The commenter believes that the critical habitat designations will have a significant economic effect extending far beyond the draft's narrow concept of a *Federal nexus*.

Response: The Service has authority under section 7 of the Act to consult on activities on land owned by individuals, organizations, states, or local and tribal governments only if the activities on the land have a *Federal nexus*. A *Federal nexus* occurs when the activities require a Federal permit, license, or other authorization, or involve Federal funding. The Service does not have jurisdiction under section 7 to consult on activities occurring on non-Federal lands when the activities are not federally funded, authorized, or carried out. In addition, consultation is not required for activities that are not likely to affect listed species or their critical habitat.

The DEA considered the economic impacts of section 7 consultations related to critical habitat even if they are attributable co-extensively to the listed status of the species. In addition, the DEA examined any indirect costs of critical habitat designation such as where critical habitat triggers the applicability of a State or local statute or regulation.

However, all of the other protections of the Act apply upon listing a species, and are not directed affected by the critical habitat designation. Where it is the listing of a species, rather than the designation of critical habitat, that prompts action at the State or local level or applies a particular protection, the impacts are not attributable to critical habitat designation and are not appropriately considered in the economic analysis of critical habitat designation. For example, there are no *take* prohibitions associated with critical habitat. *Take* prohibitions under Hawai'i law are purely attributable to a listing decision and do not co-extensively occur because of critical habitat designations. Thus, the DEA did not include an analysis of the impact of these other sections of the Act.

7.c. Comment (Federal Nexus)

A commenter stated that the DEA fails to recognize all the connections between Federal and State law. For example, if the Federal government approves eligibility for flood insurance, flood plain development programs shall become subject to consultations under the Act. Another comment stated that while the Service has stated that critical habitat affects only activities that require Federal permits or funding, and does not require landowners to carry out special management or restrict use of their land, the DEA fails to address the breadth of Federal activities that affect private property in Hawai'i and the extent to which private landowners are required to obtain Federal approval before they can use their property. The commenter elaborated that these requirements also extend to State agencies requiring Federal funds or approvals.

Response: The analysis in the DEA, as revised by the Addendum, is based on a review of all "reasonably foreseeable" projects, land uses, and activities that may be directly affected by the implementation of section 7 for the Plants. "Reasonably foreseeable" projects, land uses, and activities were defined in the DEA as those which are (1) currently authorized, permitted, or funded; (2) proposed in plans currently available to the public; or (3) projected or likely to occur within the next ten years based on (a) recent economic or land-use trends, development patterns, evolving technologies, competitive advantages, etc., and (b) limits imposed by land-use controls, access, terrain, infrastructure, and other restrictions on development. After determining the "reasonably foreseeable" projects, land uses, and activities that could affect the physical and biological features of the proposed critical habitat units, the next step in the analysis was to determine *Federal involvement*. Thus, the DEA did not evaluate all potential activities with *Federal nexus*; instead the DEA was limited to those that were "reasonably foreseeable." The results of this analysis are presented in Table VI-3 in the DEA and Table Add-2 in the Addendum.

In addition, the Service has indicated that it intends to modify the critical habitat units. As modified, the intended critical habitat units overlap slightly with areas identified by the Federal Emergency Management Agency as Special Flood Hazard Areas (SFHAs). The purchase of flood insurance is required to qualify for secured financing to buy, build or improve structures in SFHAs and is optional for areas outside SFHAs. Though underwritten by the Federal government, this insurance is not offered directly by FEMA but is available only through private insurance companies. There is no history of past consultations for flood insurance. Finally, no known residential or commercial developments are planned within the critical habitat that overlaps with SFHAs. Thus, consultations based upon eligibility for flood insurance or flood plain development programs are not considered reasonably foreseeable within the next ten years.

7.d. Comment (Economic Impact Not Reported in Summary Table)

One commenter stated that several economic impacts are acknowledged in the DEA, but their impacts are not quantified in summary tables. These include: 1) the value of hunting estimated at

\$1,430,000, 2) economic loss of up to \$675,000,000 if the State places critical habitat in the Protective Subzone of the Conservation District, 3) and indirect costs beyond section 7 costs.

Response: Although the DEA does provide general estimates of some of the potential indirect costs, these estimates are not totaled or reported in the Summary Table because of the speculative nature of many of these costs. Instead, the table reports qualitatively on their likelihood and their potential magnitude.

In addition, the DEA does not estimate the value of hunting on Moloka'i at \$1,430,000. Instead, the DEA reported a number of figures that act as indicators of the value of hunting. Specifically, the DEA reported that hunting on Moloka'i generates approximately \$340,000 direct sales, \$670,000 direct and indirect sales, generates \$280,000 in income and \$140,000 in surplus value. These estimates reflect separate methods to illustrate the total value of hunting and are not intended to be added together. Moreover, it should be noted that these numbers were updated in Section 5 of this Addendum to incorporate data from the Service's 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

Finally, the potential economic loss associated with a reduction in property value due to redistricting of all Agricultural land to the Protective Subzone of the Conservation District has been significantly reduced due to the intended modification of critical habitat units for biological reasons. The DEA estimated that if all the privately owned Agricultural land on Moloka'i were to be redistricted, the total reduction in value could range from \$9 million to \$675 million (based on a per-acre loss of \$1,000 to \$75,000). The DEA did note that values in the lower end of the range were more likely due to the remote nature of most of the privately owned Agricultural land proposed for designation. The Service has indicated that it intends to revise the critical habitat designation for biological reasons, which would result in a significant reduction in the amount of privately owned Agricultural land as well as the amount of Agricultural land actively used in agriculture. Thus, for the intended revised designation, the potential economic loss, should redistricting of all privately owned Agricultural land occur, is estimated at \$715,000, as discussed in Section 5.c. of this Addendum.

7.e. Comment (Housing and Development)

On Moloka'i, the Service is unaware of a significant number of future housing or resort development activities in coastal areas which might trigger section 7 consultation by requiring permits from Federal agencies.

Response: Chapter VI, Section 3.e. of the DEA discussed potential residential development within the critical habitat and concluded that no resort or residential development was anticipated within the next ten years. No new information has been provided that contradicts this conclusion; thus, no changes have been made to the DEA.

7.f. Comment (Groundwater Exploration)

One commenter noted that critical habitat Units F and G are potential sites for groundwater exploration and Federal funding or agencies may be involved.

Response: Chapter VI, Section 3.g. of the DEA discussed section 7 costs associated with water system development as part of the Moloka'i Irrigation System or by Moloka'i Ranch. The Addendum analyzes additional information from the Maui County Department of Water Supply (DWS) regarding a proposed backup well and concludes that the planned well and accompanying access road are located outside the area that the Service has indicated will be proposed for the final

critical habitat designation. As such, no additional costs were included in the Addendum for this project.

7.g. Comment (DHHL Development)

One commenter stated that the designation of critical habitat in Units F and G would require hundreds of Kapaakea subdivision future beneficiaries to conduct an environmental assessment and section 7 consultation in order to construct their home and prepare ground for farming. The commenter further noted that DHHL's homesteading program uses Federal programs to guarantee and insure the mortgages of our homesteaders and Federal funds may be used to construct site improvements and homes.

Response: The DEA focused primarily on the "reasonably foreseeable" projects, land uses, and activities that could affect the physical and biological features of the proposed critical habitat units as these are the activities that could be affected by the critical habitat designation. "Reasonably foreseeable" projects, land uses, and activities were defined in the DEA as those which are (1) currently authorized, permitted, or funded; (2) proposed in plans currently available to the public; or (3) projected or likely to occur within the next ten years based on (a) recent economic or land-use trends, development patterns, evolving technologies, competitive advantages, etc., and (b) limits imposed by land-use controls, access, terrain, infrastructure, and other restrictions on development. The DEA did not discuss future development within Kapaakea because none of the information available indicated that new residential development or new agricultural activity was likely within the next ten years; thus, these activities were not considered "reasonably foreseeable."

The Service indicates that it intends to modify Units F and G, and as a result, the total amount of DHHL land within critical habitat would be reduced by two-thirds, from approximately 3,336 acres to 1,049 acres. The DHHL land that would remain in critical habitat is located *mauka* and eastward of the existing Kapaakea Homestead, and most is adjacent to the Moloka'i Forest Reserve. There are no publicly available plans for development of this area within the next ten years, nor has DHHL indicated that development of this area within the next ten years is likely. Thus, no section 7 costs for residential development by Native Hawaiian beneficiaries in Units F and G have been included in the Addendum.

7.h. Comment (Hunting)

One commenter stated that Moloka'i hunters were concerned about the potential loss of hunting areas and questioned whether or not fences to exclude ungulates will be constructed, and, if so, where construction will take place. Another commenter questioned why a cost was associated to project modifications to the management of game hunting on State managed lands because Moloka'i does not have any State hunting areas that are managed to maintain or enhance game mammal populations. The commenter also questioned the methodology used to estimate the project modification cost because game mammals travel freely.

Response: Chapter VI, Section 4.b. of the DEA discussed the potential indirect impact of critical habitat on the management of game mammals, including the potential loss of hunting lands. The DEA noted that section 7(a)(2) of the Act by itself does not require DLNR to manage State hunting lands to protect critical habitat; assure the survival and conservation of listed species; or participate in projects to recover species for which critical habitat has been established. Moreover, the DEA noted that critical habitat designation does not require (1) creating any reserve, refuge, or wilderness areas; (2) fencing for any reason; (3) removing ungulates; or (4) closing areas to hunters. Instead, it requires only that, if DLNR seeks to undertake an activity that may affect the designated area using Federal funding or with a Federal permit, the Federal Action agency consult with the

Service. Chapter VI, Section 3.a.(2) of the DEA and section 4.a. of this Addendum discussed the direct economic impact of critical habitat designation on Federally-funded game management activities. As noted in the DEA, because Moloka'i does not have any State hunting areas that are managed to maintain or enhance game mammal populations, project modifications are anticipated to be similar to those in the past and fairly minor. They are not anticipated to include closure of hunting areas. In addition, as noted in the DEA, DLNR is likely to avoid costly project modifications by using Federal funds for game management projects that do not adversely affect listed species or their critical habitat, and if needed, use only State funds on projects that the Service believes could have adverse impacts.

Chapter VI, Section 3.a. of the DEA discussed section 7 costs relating to the management of game hunting. Based on the public comment and on additional information received, the estimate for project modifications of game management programs was revised in Section 4.a. of the Addendum.

7.i. Comment (Moloka'i Ranch)

One commenter (Moloka'i Ranch) requested that its lands not be designated as critical habitat due to the following reasons: 1) land values would be detrimentally affected, 2) designation may conflict with existing operations of an economically vital surface water collection system that is maintained in Kaunakakai Ahuua'a and Kawela Forest Reserve lands, and 3) lands proposed for designation on the west end of the ranch are used for grazing and recreation.

Response: The Service has indicated that it intends to modify the critical habitat units for biological reasons, which would reduce the acreage of land owned by Moloka'i Ranch from the approximately 2,670 acres initially proposed for designation to approximately 558 acres. Approximately 190 acres that would remain in the designation is located near the northern coastline on the west side of Moloka'i, in a remote area. Most of the 190 acres is in the Agricultural District, but a portion of the land along the coastline is within the Conservation District. The remaining 367 acres that would remain in the designation is located in the Conservation District within the Moloka'i Forest Reserve.

Chapter VI, Section 4.g. of the DEA discussed the potential indirect impact that the designation of critical habitat could have on property values. The DEA noted that the worst-case scenario – and one that is not expected over the long term because uncertainties about the implications of the designation are likely to dissipate over time – would be a perception among potential buyers that the land should be valued as if it were subject to the same restrictions as land in the Conservation District. The DEA also states that land values on Moloka'i could drop between \$1,000 per acre for remote agricultural land to \$75,000 per acre for land suitable for development as a result of redistricting to the Conservation District. The commenter did not provide alternative estimates.

Thus, an estimate of the potential impact on Moloka'i Ranch's land values is as follows: The 367 acres are not likely to lose value due to critical habitat designation because of their presence within Conservation District. While the total drop in value for the approximately 190 acres in the Agricultural District could range from \$190,000 to \$14.2 million, any loss in value due to redistricting is more likely to be on the lower end of the range due to the remote location and distance from infrastructure of these 190 acres.

No costs are expected to occur from impacts to the existing water collection system, because none of the Plants are stream-dependent for their survival and therefore would not cause a reduction

in water diversion. In addition, water infrastructure is considered a manmade feature and therefore its operation and maintenance are not subject to the critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*.

No costs are expected to occur from impacts to lands proposed for designation on the west end of the ranch that are used for grazing and recreation. As noted in Chapter III of the DEA, the Service does not have jurisdiction under section 7 to consult on activities occurring on non-Federal lands when the activities are not federally funded, authorized, or carried out. Because there is no known *Federal involvement* in the grazing and recreational activities identified by the commenter, no costs are anticipated to occur as a result of critical habitat designation.

7.j. Comment (Subsistence)

One commenter stated that because unemployment is so high in Moloka'i, restrictions on subsistence activities, such as hunting and fishing, may cause a much greater economic impact than is suggested in the DEA.

Response: Chapter VI, Section 4.d. of the DEA discussed the economic impact critical habitat designation may have on subsistence activities. The designation of critical habitat by itself will not directly impact subsistence activities, as critical habitat designation does not require (1) creating any reserve, refuge, or wilderness areas; (2) fencing for any reason; (3) removing ungulates; or (4) closing areas to hunters or gatherers. Instead, it requires only that if the State or a private landowner seeks to undertake an activity that may affect the designated area using Federal funding or with a Federal permit, the Federal Action agency consult with the Service.

However, the DEA recognized that there is some risk that designation of critical habitat could have an indirect impact on subsistence activities if, as a result of a future lawsuit, a court mandated actions which reduced the ability of individuals to practice subsistence activities in these areas. However, the probability of a lawsuit being filed, the likelihood of its success, and the role of critical habitat in the suit are unknown. In addition, the DEA recognized the possibility that the State or private landowners could adopt a policy of restricting access into areas that overlap critical habitat units without a judicial mandate. The likelihood of voluntary landowner restrictions is also unknown. Based on professional judgment, however, the probability of a complete restriction of subsistence activities within critical habitat as a result of lawsuits or voluntary action was deemed unlikely.

The DEA was unable to quantify this indirect impact because of (1) the lack of information on the amount of the subsistence harvest; (2) the lack of information on the proportion of the subsistence harvest derived from areas within versus outside critical habitat; and (3) the lack of information on the cultural significance of the subsistence activities conducted within critical habitat. Thus, the DEA concluded that while there could be a significant loss associated with the restriction of subsistence activities within the proposed critical habitat, the probability of subsistence activities actually being restricted within the proposed critical habitat was undetermined but generally unlikely.

7.k. Comment (Non Point Source Water Discharge)

One commenter notes that a *Federal nexus* exists for the non-point source water discharge program. This commenter was concerned that if water discharge into critical habitat does not meet water quality standards, a permit could be denied. The commenter proposes that the effect on agriculture may be devastating since some run-off from agricultural activities is unavoidable.

Response: The State Department of Health Polluted Runoff Control Program and the State Office of Planning, Coastal Zone Management Program, work together to address nonpoint source pollution through outreach and education and programs that utilize incentives. Under the Coastal Zone Act Reauthorization Amendments, Section 6217, the State is required to meet various conditions for approval of the State's Coastal Nonpoint Pollution Control Program by the U.S. Environmental Protection Agency. To meet these conditions, the State Department of Health is developing administrative rules to create Statewide enforceable policies and mechanisms to address nonpoint source pollution. These draft rules are currently the subject of public informational meetings. Public comments and suggestions received during these meetings will be considered before final rules are drafted and proposed to the Governor.

At the present time, there is no permit requirement for nonpoint source pollution. Moreover, the proposed rules regarding nonpoint source pollution make no reference to critical habitat. The proposed rules simply provide a general prohibition on nonpoint source pollution and allow for an exemption of violation under certain conditions (for example, if best management practices are utilized). The probability that these rules will be adopted without significant changes is impossible to determine, as the recent elections resulted in an administration change and the new Governor's position on the issue of non-point source water pollution is not yet known. Moreover, at this point, critical habitat does not appear to play any role in the proposed rules. Thus, the possible economic impact, if any, caused by the interplay of nonpoint source pollution requirements and the designation of critical habitat is entirely speculative and unable to be estimated.

7.1. Comment (Impact on Land Use)

One comment stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawai'i's Land Use Law. Critical habitat could result in downzoning under State law. HRS § 205-2(e) states that Conservation Districts shall include areas necessary for conserving endangered species. HRS §195D-5.1 states that the Department of Land and Natural Resources (DLNR) shall initiate amendments in order to include the habitat of rare species. Even if DLNR does not act, the State Land Use Commission may initiate such changes, or the State may be forced to act by citizen suits. Areas for endangered species may be placed in the Protective Subzone with the most severe restrictions. While existing uses can be grandfathered in, downzoning will prevent landowners from being able to shift uses in the future, reduce market value, and make the land unmortgageable. Additionally, forced redistricting from Agricultural to Conservation could increase real property taxes even while driving down the real value of the property.

Response: Both the DEA and this Addendum attempt to quantify the potential impacts from downzoning. As indicated earlier in this Addendum, the Service has indicated that it plans to remove most of the land in the Agricultural District from the final critical habitat designation. The intended modification would result in the inclusion of about 2,608 acres of Agricultural lands in the revised designation. Limited grazing takes place in these Agricultural lands. As discussed in section 5.c. of the Addendum, assuming a worst-case scenario, and one which is NOT envisioned, reduction in land values due to redistricting land within the intended critical habitat designation from Agricultural to Conservation District could approach \$715,000. Under this scenario, even if a landowner has no plans to sell the land, the loss in land value could reduce potential mortgage financing.

However, the likelihood of redistricting is not certain, and, in fact, is expected to be small. The assessment of the probabilities of certain indirect impacts in the DEA is based on State and local laws and regulations; discussions with State and local officials, landowners, and lawyers; and professional judgment.

The DEA also addresses the possibility that citizen suits could compel the State to undertake conservation actions in accordance with State or Federal laws. Chapter VI, Section 4.c. of the DEA states that there is an undetermined probability that a Federal or State court could mandate conservation management of critical habitat, and that it is beyond the scope of the economic analysis to assess the legal merits the arguments for or against conservation management, the probability that a lawsuit will be filed, and, if filed, to identify possible outcomes of a court decision and the associated probabilities.

7.m. Comment (Impact of Take Provision under State Law)

One comment stated the following: The DEA fails to consider economic impacts of listing and critical habitat that result through interaction with State law, specifically Hawai‘i’s Endangered Species Act. New Mexico Cattlegrowers Association v. U.S. Fish and Wildlife Service requires consideration of the impact of listing as well as the impact of designating an area as critical habitat. Instead, the analysis is expressly limited to the impact of Federal agency consultation under the jeopardy standard. However, since listing triggers listing under State law, the Service must consider the impact of *take* prohibitions under State law (and consequently Federal law which prohibits destruction of plants in knowing violation of State law).

Response: The DEA considers the economic impacts of section 7 consultations related to critical habitat even if they are attributable co-extensively to the listed status of the species. In addition, the DEA examines any indirect costs of critical habitat designation such as where critical habitat triggers the applicability of a State or local statute. However, where it is the listing of a species that prompts action at the State or local level, the impacts are not attributable to critical habitat designation and are not appropriately considered in the economic analysis of critical habitat designation. *Take* prohibitions under Hawai‘i law are purely attributable to a listing decision and do not co-extensively occur because of critical habitat designations. There are no *take* prohibitions associated with critical habitat.

7.n. Comment (State Environmental Impact Statement and Special Management Area Permit)

A commenter stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawai‘i’s Environmental Impact Statement Law. HRS § 343-5 applies to any use of conservation land, and a full Environmental Impact Statement is required if any of the significance criteria listed in HAR § 11-200-12 apply. One of these criteria is that an action is significant if it “substantially affects a rare, threatened or endangered species or its habitat.” This will result in costly procedural requirements and delays. However, the DEA does not acknowledge that any impact on endangered species habitat will be deemed to be “significant.” Multiple commenters also stated the following: the DEA fails to evaluate the practical effect critical habitat designation will have on development. Special Management Area permits administered by Maui County as required by Hawai‘i’s Coastal Zone Management Act will be harder to get, will result in delays, will cause a decline in property values and may make it impossible to develop.

Another commenter stated the following: The Service has taken the position in other states that it has a right to intervene in local land use proceedings if they affect endangered species on private property, as evidenced by the Service’s petition to the local zoning board in Arizona to postpone approval of a rezoning petition pending a survey to determine the extent to which an endangered plant was present on the property even though no Federal approval was being sought. The commenter concluded that the failure of the Service to address these activities in the DEA is a fundamental error of the analysis.

Response: Adverse impacts on development, including delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, etc., are not expected since there are no known development plans within the areas the Service has indicated will be proposed for final designation. Furthermore, the following factors make future development projects in the proposed critical habitat highly unlikely: (1) as modified, approximately 89 percent of the proposed critical habitat is in Conservation District where development is severely limited; (2) the approximately 11 percent of the proposed critical habitat in the Agricultural District is in arid areas or areas lined with gulches or steep cliffs, and generally support limited, if any, grazing; (3) there are no known plans for development within the proposed critical habitat as modified; and (4) as modified, most of the land proposed for critical habitat in the Special Management Area is also within the Conservation District, where development is severely limited.

7.o. Comment (Impact on Water Use)

A commenter stated the following: the DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically the State Water Code. HRS § 174C-2 states that “adequate provision shall be made for protection of fish and wildlife.” HRS § 174C-71 instructs the Commission of Water Resource Management to establish an instream use protection program to protect fish and wildlife. Since landowners may depend on water pumped from other watersheds, these effects can be far-reaching. It is impossible to tell from the descriptions in the proposal whether any water diversions will have to be reduced as a result of listing and critical habitat designation. The Service has an obligation to thoroughly investigate this issue and refrain from designating critical habitat until it has determined whether its actions will affect water use and balance this against any benefit to the species. Another commenter stated that if the critical habitat proposal would require reducing water diversions from any stream, the Service should investigate whether that would take anyone’s vested water rights.

Response: No costs are expected to occur from such impacts to water systems, because none of the Plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion. In addition, water infrastructure is considered a manmade feature and therefore its operation and maintenance are not subject to the critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any *primary constituent elements*.

7.p. Comment (New Water Diversions)

One commenter stated the following: The DEA fails to discuss economic impacts that may occur if opponents of water diversions use critical habitat designations to delay and confuse water use decisions on the grounds that any water diversion upstream of critical habitat may increase an endangered plant’s risk of extinction. Furthermore, the burden of proof that diversions will not cause extinction will be placed on those diverting water. Proof will be difficult because so little is known about the needs of these species.

Response: Chapter VI, Section 3.g.(1) of the DEA states that it is highly unlikely that a new ditch system or major expansion to an existing one (including new diversions) would be proposed or approved in the proposed critical habitat. This assessment is made due to the existing protections provided by the baseline environmental regulations, current environmental and cultural concerns, current economic and financial constraints, likely public opposition to stream diversions, and difficulties in obtaining permits.

7.q. Comment (Future Litigation and Mandated Management)

One commenter stated that the cost of potential citizen law suits preventing certain activities or requiring some sort of management in critical habitat was not discussed in the DEA. Another commenter stated that critical habitat designation will bring unnecessary and costly litigation. One commenter stated that proposed critical habitat could entail considerable cost to both the State and private landowners. One commenter stated that critical habitat designation could indirectly result in limitations or special management requirements (such as fencing or control of invasive species) being established on private lands. The commenter pointed out that the DEA estimates that the *Palila* court decision may be interpreted to mandate private conservation and could cost Moloka'i landowners \$840,000 to \$2,240,000 per year, or \$8.4 million to \$22.4 million over ten years. However, Table VI-3 of the DEA dismisses these costs as minor and does not add them to the total cost estimate. The commenter suggested that these costs should be considered.

Response: The Act does not obligate landowners to manage their land to protect critical habitat, nor would landowners and managers be obligated under the Act to participate in projects to recover a species for which critical habitat has been established. However, Chapter VI, Section 4.c. of the DEA does discuss the potential mandate for conservation management pursuant to litigation and the resulting costs for the proposed designation on Moloka'i. Specifically, adverse impacts on development, including delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, etc., are not expected since there are no known development plans within the areas the Service has indicated will be proposed for final designation. Furthermore, the following factors make future development projects in the proposed critical habitat highly unlikely: (1) as modified, approximately 89 percent of the proposed critical habitat is in Conservation District where development is severely limited; (2) the approximately 11 percent of the proposed critical habitat in the Agricultural District are in arid areas or areas lined with gulches or steep cliffs, and generally support limited, if any, grazing; (3) there are no known plans for development within the proposed critical habitat as modified; and (4) as modified, most of the land proposed for critical habitat in the Special Management Area is also within the Conservation District, where development is severely limited. To the extent that these factors render small the probability of a successful lawsuit mandating conservation practices, the actual costs would be minor (i.e., the expected value of the costs would be low). Nonetheless, while it is conceivable that there may initially be an increase in subsequent lawsuits related to the critical habitat designation, it is not possible to predict their number, degree of complexity, or any other associated effect due to scant historical evidence for the Plants.

7.r. Comment (Cost of Litigation)

Several commenters stated the following: The cost of potential citizen suits preventing certain activities or requiring some sort of management in critical habitat was not discussed in the DEA. Litigation regarding land management requirements is not only foreseeable, but is likely. The proposals will give the government and the environmental groups a legal excuse to attack anyone whose land is listed as critical habitat. Human freedom and constitutional principles are far more important than biologically incompetent plants. Critical habitat designation will bring unnecessary and costly litigation, thus creating an economic disaster that would severely challenge one private landowner's economic viability. Another commenter also stated that even if litigation is unrealistic, expectations of litigation alone can lower property values.

Response: As discussed in the DEA and in the Addendum, an undetermined probability exists that a Federal or State court could mandate certain indirect impacts as a result of critical habitat. However, it is beyond the scope of the economic analysis to assess the legal merits of the arguments for or against the various indirect impacts, the probability that a lawsuit will be filed, and, if filed, to

identify possible outcomes of a court decision and the associated probabilities. However, whenever possible, the DEA and the Addendum present the worst-case scenario of the costs associated with third party lawsuits.

7.s. Comment (Takings)

One commenter stated the following: The Service did not adequately address the takings of private property as a result of designating critical habitat for the Plants. In addition, if the proposed designation of critical habitat precipitates conversion of agricultural lands to conservation land that has no economically beneficial use, then the Federal and State governments will have taken private property. Additionally, the landowner may incur the cost of litigation against the government to make it pay just compensation.

Response: The possible costs associated with redistricting land were discussed in the DEA under indirect costs. Since the publication of the DEA, the Service has indicated its plans to remove most of the land in the Agricultural District from the final critical habitat designation. As noted in Section 5.c. of this Addendum, redistricting the remaining parcels to the Conservation District is not likely to significantly reduce the value of the land because (1) any areas that have been historically grazed are likely to be put in a subzone that will allow grazing (i.e., not the Protective Subzone), and (2) the economic use of the land is already constrained by topography, remote location, and other existing restrictions.

7.t. Comment (Investigative Cost)

One commenter stated that precise mapping of manmade objects is needed and that the estimate of the time to investigate the implications of critical habitat is too low given the size of the proposed designated areas, the vagueness of the regulations concerning these unmapped holes, and the real costs of obtaining all necessary approvals for a development project in Hawai'i. Another commenter questioned whether the indirect cost of investigating the implications of critical habitat should be considered a sunk cost of the critical habitat designation process rather than a potential future cost of a final designation.

Response: To address these concerns, the Addendum revisits the hours estimate presented in the DEA. Chapter VI, Section 4.f. of the DEA indicates that the landowner may want to learn how the designation may affect (1) the use of his land (either through restrictions or new obligations), and (2) the value of his land. Since the commenters did not provide an estimate of time or cost incurred in order to investigate implications of critical habitat, this Addendum conservatively doubles the estimate of hours spent by the landowner and/or his attorneys or professional staff on investigating the issues. As described in Section 5.g. of this Addendum, using these new assumptions, the analysis estimates that total section 7 costs range from \$73,500 to \$218,500, all of which are attributable to critical habitat.

While some landowners may expend time and money to investigate the implications of critical habitat on their land during the designation process, many landowners may not do so until after final designation is complete. Thus, the DEA and the Addendum treat these costs as a cost attributable to the final designation.

7.u. Comment (Benefits Analysis)

One commenter stated that the DEA lacks a thorough benefits analysis. The commenter maintained that the DEA does not include the benefits of watershed protection and improvement, protection of other stream and riparian biota, and the value of the Plants as an indicator of ecological health. Other multiple commenters stated that the DEA ignored the benefit of keeping other native

species off the endangered species list, of maintaining water quality and quantity, of promoting ground water recharge, and of preventing siltation of the marine environment, thus protecting coral reefs. Another commenter noted that additional benefits of critical habitat include combating global warming, providing recreational opportunities, attracting ecotourism, and preserving Hawai'i's natural heritage. The commenter also noted that the Service must use the tools available, such as the University of Hawai'i (UH) Secretariat for Conservation Biology study that estimated the value of ecosystem services, to determine the benefits of critical habitat. Another commenter stated that the DEA overestimates economic benefits and many of the alleged benefits are entirely speculative, unquantifiable or lack any commercial value.

Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop (1978, 1980), Brookshire and Eubanks (1983), Boyle and Bishop (1986), Hageman (1985), Samples et al. (1986), Stoll and Johnson (1984)). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lillieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations.

Chapter VI, Section 6.c. of the DEA already discusses the potential benefits addressed in the above comments. However, the DEA also indicates that these benefits are not quantified due to lack of information available on 1) quantified data on the value of the Plants; and 2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation (for example, how many fewer ungulates will roam into the critical habitat, how many fewer invasive plants will be introduced as a result, and therefore how many more of the Plants will be present in the area).

Although the UH study does value ecosystem services, it has limited applicability for valuing the benefits of the proposed critical habitat designation for the Plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of O'ahu versus the value of the more limited benefits provided by the proposed critical habitat for the Plants on the island of Moloka'i. Consistent with its purpose, the UH study provides no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the Plants critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on O'ahu—an island which is more than twice the size of Moloka'i but has a population of more than 115 times that of Moloka'i. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the man-made Ala War Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin so must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with most of the Plants critical habitat. Most of the Plants critical habitat units are in mountainous ranges with steep slopes and difficult access and on coastal cliffs.

7.v. Comment (Water Systems)

One commenter stated the following: Although agricultural production areas are excluded from the proposed critical habitat units, agricultural resources appear to be included, particularly the source for the Moloka'i Irrigation System in Waikolu Valley. The commenter requested assurance

that long term improvements to the irrigation system will not be precluded by critical habitat designation.

Response: Chapter III of the DEA noted section 7(a)(2) of the Act requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit, or carry out do not result in destruction or *adverse modification* of critical habitat. Further, the DEA noted that the Service does not have jurisdiction under section 7 to consult on activities occurring on non-Federal lands when the activities are not federally funded, authorized, or carried out. Thus, because the Moloka'i Irrigation System is not located on Federal land, critical habitat designation will have no direct impact on any long-term improvements constructed by the State unless the improvements involve Federal funding or require Federal permits.

When an activity proposed by a State or local government or private entity requires a Federal permit or is federally funded or carried out, the Federal agency with the *nexus* to the activity ("Federal Action agency") initiates consultation with the Service. The consultation between the Federal Action agency and the Service may involve informal consultation, formal consultation in the case of adverse impacts, or both. If during informal consultation the Federal Action agency determines that its action (as originally proposed or revised and taking into account direct and indirect effects) "is not likely to adversely affect" listed species or critical habitat (e.g., the effects are beneficial, insignificant or discountable), and the Service agrees with that determination, then the Service provides concurrence in writing and no further consultation is required.

But if the proposed action, as revised during informal consultation, is still likely to adversely affect listed species or critical habitat, the Action agency must request in writing initiation of formal consultation with the Service. If the Service finds, in its biological opinion, that a proposed action is not likely to *jeopardize* the continued existence of a listed species, or destroy or *adversely modify* the critical habitat—even though the action may adversely affect listed species or critical habitat—then the action likely can be carried out without violating section 7(a)(2) of the Act.

On the other hand, if the Service finds that a proposed action is likely to *jeopardize* the continued existence of a listed species and/or destroy or *adversely modify* the critical habitat, then the Service provides the Action agency with reasonable and prudent alternatives that will keep the action below the thresholds of *jeopardy* and/or *adverse modification*, if any can be identified. The Service works with Action agencies and Applicants in developing reasonable and prudent alternatives. A reasonable and prudent alternative is one that (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the Action agency's legal authority and jurisdiction; and (3) is economically and technologically feasible. The Service will, in most cases, defer to the Action agency's expertise and judgment as to the feasibility of an alternative. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of a project. Costs associated with implementing reasonable and prudent alternatives vary accordingly.

Thus, long-term improvements to the Moloka'i Irrigation System will not be precluded by critical habitat designation, but under a worst-case scenario, long-term improvements to the Moloka'i Irrigation System may involve the development of reasonable and prudent alternatives to prevent *adverse modification* of the critical habitat.

Chapter VI, Section 3.g. of the DEA and Section 4.g. of this Addendum reviewed the water development projects most likely to occur within the proposed critical habitat. As discussed in Chapter VI, Section 3.g. of the DEA and Section 4.g. of this Addendum, there are no section 7

consultations anticipated regarding water development projects within the next ten years. Thus, the development of reasonable and prudent alternatives is not foreseeable at this time, and as a result, there are no specific examples of reasonable and prudent alternatives that might occur or the costs associated with their development.

7.w. Comment (Future Agricultural Use and/or Water Resource Development)

One commenter stated the following: The designation of critical habitat in *unoccupied* areas may effectively extinguish the potential for intensive or extensive agricultural use or irrigation water resource development.

Response: As noted in Section 7.v., Chapter III of the DEA noted section 7(a)(2) of the Act requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit, or carry out do not result in destruction or *adverse modification* of critical habitat. Further, the DEA noted that the Service does not have jurisdiction under section 7 to consult on activities occurring on non-Federal lands when the activities are not federally funded, authorized, or carried out.

As a result, future intensive or extensive agricultural use or irrigation water resource development in unoccupied areas of designated critical habitat will not be subject to section 7 consultation unless it involves Federal funding or requires Federal permits.

The involvement of Federal funding and/or Federal permits will not extinguish the potential for intensive or extensive agricultural use or irrigation water resource development. Instead, the Federal Action agency initiates consultation with the Service. The consultation between the Federal Action agency and the Service may involve informal consultation, formal consultation in the case of adverse impacts, or both. If during informal consultation the Federal Action agency determines that its action (as originally proposed or revised and taking into account direct and indirect effects) “is not likely to adversely affect” listed species or critical habitat (e.g., the effects are beneficial, insignificant or discountable), and the Service agrees with that determination, then the Service provides concurrence in writing and no further consultation is required.

But if the proposed action, as revised during informal consultation, is still likely to adversely affect listed species or critical habitat, the Action agency must request in writing initiation of formal consultation with the Service. If the Service finds, in its biological opinion, that a proposed action is not likely to *jeopardize* the continued existence of a listed species, or destroy or *adversely modify* the critical habitat—even though the action may adversely affect listed species or critical habitat—then the action likely can be carried out without violating section 7(a)(2) of the Act.

On the other hand, if the Service finds that a proposed action is likely to *jeopardize* the continued existence of a listed species and/or destroy or *adversely modify* the critical habitat, then the Service provides the Action agency with reasonable and prudent alternatives that will keep the action below the thresholds of *jeopardy* and/or *adverse modification*, if any can be identified. The Service works with Action agencies and Applicants in developing reasonable and prudent alternatives. A reasonable and prudent alternative is one that (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the Action agency’s legal authority and jurisdiction; and (3) is economically and technologically feasible. The Service will, in most cases, defer to the Action agency’s expertise and judgment as to the feasibility of an alternative. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of a project. Costs associated with implementing reasonable and prudent alternatives vary accordingly.

Thus, the potential for intensive or extensive agricultural use or irrigation water resource development will not be extinguished as a direct result of critical habitat designation. Rather, and only if Federal funding or Federal permits are involved, the Federal Action agency will consult with the Service to determine if the activity “is likely to adversely affect” the critical habitat. In the worst case, the proposed agricultural use or irrigation water development may involve the development of reasonable and prudent alternatives to prevent *adverse modification* of the critical habitat.

Chapter VI, Sections 3.d. and 3.g. of the DEA and Sections 4.d., 4.e., and 4.g. of this Addendum reviewed the agricultural uses and water development projects most likely to occur within the proposed critical habitat. As revised, critical habitat overlaps with only 2,608 acres of Agricultural land, most of which is owned by the State. As discussed in Chapter VI, Sections 3.d., 3.e., and 3.g. of the DEA and Sections 4.d., 4.e. and 4.g. of this Addendum, there are no section 7 consultations anticipated regarding agricultural uses or water development projects within the next ten years. Thus, the development of reasonable and prudent alternatives is not foreseeable at this time, and as a result, there are no specific examples of reasonable and prudent alternatives that might occur or the costs associated with their development.

Further, Chapter VI, Section 4.e. of the DEA discussed the indirect impacts resulting from the redistricting of private land in the Agricultural District into the Conservation District. The DEA noted that under a worst-case scenario, areas designated as critical habitat could be placed in the Protective Subzone with the most severe restrictions, which could prevent a new agricultural use or interfere with irrigation water development. As indicated in the Addendum, the likelihood of mandated redistricting is undetermined, but is expected to be small. The assessment of the probabilities of certain indirect impacts in the DEA is based on State and local laws and regulations; discussions with State and local officials, landowners, and lawyers; and professional judgment. As discussed in Section 5.c. of the Addendum, the total drop in property value should redistricting of all privately owned Agricultural land occur could be approximately \$715,000.

8. SUMMARY OF ECONOMIC IMPACTS

Table ES-1 of the DEA, which is duplicated as Table VI-3 in Chapter VI, presents the costs and benefits attributable to the listing of the Plants and their proposed critical habitat. Table Add-2 in this Addendum presents revised costs and benefits based on issues raised in public comments on the DEA, new information obtained since the DEA was published, and the units the Service has indicated will be removed or reduced in the final rule. Table Add-2 also compares the DEA costs with the revised costs, and provides explanations as needed.

For the economic impacts that can be valued, the table shows changes in the direct costs associated with management of game hunting, Kalaupapa landfill relocation, Ilio Point conservation project, NRCS funded conservation projects on agricultural land, and communications facilities. These changes are based on the Service’s indication that some of the units will be removed or reduced due to biological reasons. These changes would cause a reduction in the total direct costs from approximately \$109,070 to \$804,750, to \$54,470 to \$269,150. Table Add-2 also presents the discounted present value and the annualized direct costs.

In general, the probabilities of the indirect costs remain the same as presented in the DEA, but the magnitude of certain possible impacts are reduced due to the areas the Service indicates will be removed from the final critical habitat designation. However, there is no change in the indirect costs associated with subsistence and Native Hawaiian traditional and cultural practices, State and county

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development approvals, condemnation of property, and reduced cooperation on conservation projects.

Similarly, there is little change in the direct and indirect benefits except that the benefit of the economic activity from conservation management is modified to reflect the intended reduction in the number of acres in the designation and that the difficulty in quantifying the indirect benefits that could result from critical habitat designation is discussed.

Table Add-2. Revised Section 7 Costs and Benefits Attributable to the Plants Listing and Critical Habitat

(10-year estimates)

CH = critical habitat PMS = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated

Item	DEA				Addendum		Explanation
	Total		Share to CH		Total		
	Low	High	Low	High	Low	High	
DIRECT SECTION 7 COSTS							
Management of Game Hunting							
State-Managed Lands, Consultations	\$ 770	\$ 12,650	\$ 220	\$ 5,750	\$ 770	\$ 12,650	Past PMs not based on occupied or unoccupied status of area; future PMs anticipated to be similar to past PMs
State-Managed Lands, PMs	\$ 17,600	\$ 148,000	\$ 13,200	\$ 111,000	\$ 4,400	\$ 37,000	
National Parks							
Kalaupapa National Park, Fencing Consultations	\$ 15,600	\$ 15,600	\$ 15,600	\$ 15,600	\$ 15,600	\$ 15,600	No changes
Kalaupapa National Park, Fencing PMs	Minor	Minor	Minor	Minor	Minor	Minor	
Relocation	\$ 8,900	\$ 19,400	\$ 8,900	\$ 19,400	\$ -	\$ -	Unlikely to be in CH as a result of unit modifications
Kalaupapa National Park, Landfill PMs	Minor	Minor	Minor	Minor	None	None	
Conservation Projects							
East Moloka'i Watershed Partnership, Consultations	\$ 5,200	\$ 65,500	\$ 5,200	\$ 5,200	\$ 5,200	\$ 5,200	No changes
East Moloka'i Watershed Partnership, PMs	None	None	None	None	None	None	No changes
Hui Malama o Mo'omomi, Consultations	\$ 5,200	\$ 10,400	\$ 1,000	\$ 5,700	\$ 5,200	\$ 10,400	No changes
Hui Malama o Mo'omomi, PMs	None	None	None	None	None	None	No changes
Ilio Point, Consultations	\$ 5,200	\$ 5,200	\$ -	\$ -	\$ -	\$ -	No longer in CH as a result of unit modifications
Ilio Point, PMs	None	None	None	None	None	None	
Wildlife Habitat Incentives Program, Consultations	\$ 5,200	\$ 47,100	\$ 5,200	\$ 47,100	\$ 5,200	\$ 47,100	No changes
Wildlife Habitat Incentives Program, PMs	None	None	None	None	None	None	
Agriculture and Ranching Operations							
Pu'u o Hoku Ranch, Consultations	\$ 15,300	\$ 25,800	\$ 15,300	\$ 25,800	\$ 5,200	\$ 5,200	Only reinitiation regarding Safe Harbor Agreement likely as a result of unit modifications
Pu'u o Hoku Ranch, PMs	\$ -	\$ 177,900	\$ -	\$ 177,900	None	None	
Other Ranching Operations, Consultations	\$ 9,700	\$ 41,200	\$ 9,700	\$ 41,200	\$ -	\$ -	Unlikely to occur in CH as a result of unit modifications
EQIP or CRP funded projects, PMs	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ -	
Real Estate Development							
Development within Agricultural District	None	None	None	None	None	None	No changes
Enterprise Community Activities, Consultations							
Development within Agricultural District	None	None	None	None	None	None	No changes
Water Systems							
Moloka'i Irrigation System	None	None	None	None	None	None	No changes
Moloka'i Ranch Water System, Consultations	None	None	None	None	None	None	No changes
Communications Facilities							
New Facilities, Consultations	\$ 7,500	\$ 9,100	\$ 7,500	\$ 9,100	\$ -	\$ 9,100	Estimate modified to a range to reflect possibility that no facilities will be constructed within CH as a result of unit modifications
New Facilities, PMs	\$ -	\$ 100,000	\$ -	\$ 100,000	\$ -	\$ 100,000	
Trails and Roads							
Unpaved Roads within State Forest Reserve, Consultations	None	None	None	None	None	None	No changes
Unpaved Roads outside State Forest Reserve, Consultations	None	None	None	None	None	None	No changes
Paved Road Widening, Consultations	\$ 8,900	\$ 19,400	\$ 8,900	\$ 19,400	\$ 8,900	\$ 19,400	No changes
Paved Road Widening, PMs	None	None	None	None	None	None	
Power Transmission Lines, Consultations							
U.S. Military Activities, Consultations	None	None	None	None	None	None	No changes
Ecotourism, Consultations							
Natural Disasters	None	None	None	None	None	None	No changes
Recovery Projects, Consultations	\$ 4,000	\$ 7,500	\$ 4,000	\$ 7,500	\$ 4,000	\$ 7,500	No changes
Recovery Projects, PMs	Minor	Minor	Minor	Minor	Minor	Minor	No changes
TOTAL DIRECT COSTS							
Direct	\$ 109,070	\$ 804,750	\$ 94,720	\$ 690,650	\$ 54,470	\$ 269,150	Totals may understate economic impact because the cost of "minor" project modifications are not included
Discounted Present Value	\$ 76,606	\$ 565,223	\$ 66,527	\$ 485,084	\$ 38,257	\$ 189,040	Present value and annualized calculations are based on the OMB prescribed seven percent discount rate and the assumption that total costs are distributed evenly over the entire period of analysis.
Annualized	\$ 10,907	\$ 80,475	\$ 9,472	\$ 69,065	\$ 5,447	\$ 26,915	

Table Add-2. Revised Section 7 Costs and Benefits Attributable to the Plants Listing and Critical Habitat

(10-year Estimates)

CH = critical habitat PMs = project modifications O&M = operation and maintenance Fed = Federal ne = not estimated

Item	DEA	Explanation of Changes from DEA
INDIRECT COSTS		
Management of Game Mammals and Loss of Hunting Lands	Slight probability of a major impact	Same probability, impact reduced based on unit modifications
Conservation Management	No obligation to proactively manage lands to control threats, but an undetermined probability of a major impact	Same obligation and probability, but impact reduced based on unit modifications
Subsistence and Native Hawaiian Traditional and Cultural Practices	Undetermined but slight probability of major impact	No change
Redistricting of Land by the State	Small probability of significant impacts	Same probability, significantly smaller impact
State and County Development Approvals	Few anticipated projects, but costs to projects could range from insignificant to substantial	No change
Reduced Property Values	Decrease in property value expected to be small, but perceptions could contribute to more significant reduction	Overall potential decrease in value smaller due to unit modifications
Condemnation of Property	No condemnation resulting from CH. Also, the Service acquires land by negotiation not by condemnation	No change
Investigate Implications of CH	25 private landowners may investigate the implications of CH on their lands; costs could range from \$53,000 to \$162,500	Revised to reflect public comment that costs to investigate are underestimated and reduction in number of affected landowners
Reduced Cooperation on Conservation Projects	Some landowners want to avoid CH designation	No change
DIRECT SECTION 7 BENEFITS		
Regional Economic Activity Generated by Conservation Management	Potential for increase, but may or may not reflect an increase in regional economy, depending on source of funding	Increase modified to reflect unit modifications
Regional Economic Activity Associated with Ecotourism	The Service prefers that guides do not feature visits to threatened & endangered plants.	No change
Regional Economic Activity Associated with Avoided Cost to Developers	Helps developers site projects.	No change
Social Welfare Benefits of Habitat Designation	The designation may result in the preservation of open lands	No change
INDIRECT BENEFITS		
Social Welfare Benefits of Endangered Species Preservation	Difficult to estimate preservation benefits and their value	No change
Social Welfare Benefits of Broader Ecological Improvements	Difficult to determine environmental improvements attributable to the implementation of section 7	No change

* Although the analysis does provide general estimates of some of the potential indirect costs shown below, not all of the estimates are summarized in this table. Because some of these indirect costs are highly speculative, this table instead reports qualitatively on their likelihood and magnitude. For additional information on any of these indirect impacts, the reader should refer to the economic cost and benefit chapter of the analysis. Only those costs deemed more likely to occur are included in this summary table in order to present the most probable overall impact of critical habitat designation.

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Information was provided in communications with representatives of:

— U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office

⁴ Certain references listed in the references section of the DEA were also used in the preparation of the Addendum.