

ADDENDUM TO THE DRAFT ECONOMIC IMPACT ANALYSIS OF PROPOSED CRITICAL HABITAT FOR THE NEWCOMB'S SNAIL

1. INTRODUCTION

In January 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 Newcomb's Snail (*Erinna newcombi*) (the Snail). This proposal encompasses approximately 5,209 acres on the island of Kaua'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 the Newcomb's Snail" (hereafter DEA) for public review and comment in March 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.

2. EXCLUDED AREAS, FEATURES AND STRUCTURES

As a result of new information and for reasons other than economic impacts, the Service intends to modify the boundaries of two proposed units in the final critical habitat designation for the Snail. The modifications are as follows:²

- **Unit III(a)—Eastside Mountain Streams, Waipahē'e Stream**

The Service intends to modify this unit by eliminating the stream diversion and the area downstream from the diversion because these areas do not exhibit the primary constituent elements required by the Snail. The modification will remove the lower 0.43 mile from the proposed unit and reduce the area by 103 acres.

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1. Copies of the *Draft Economic Impact Analysis of Proposed Critical Habitat for the Newcomb's Snail* 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 exclude these areas (memorandum May 14, 2002).

- **Unit III(c)—Eastside Mountain Streams, North Fork Wailua River**

The Service intends to modify this unit by eliminating the Blue Hole stream diversion and the area downstream from the diversion because these areas do not exhibit the primary constituent elements required by the Snail. The modification will remove the lower 0.37 mile from the proposed unit and reduce the area by 68 acres.

The above two modifications will change the total stream length proposed for critical habitat from 16.35 miles to 15.55 miles, for a reduction of 0.8 mile (4.9 percent). Total acreage will change from 5,209 acres to 5,038 acres, for a reduction of 171 acres (3.3 percent). The preamble to the final rule will explain the Service's revisions to the proposed critical habitat designation.

3. INDIRECT COSTS

3.a. Potential Indirect Impacts on Existing Stream Diversions

A number of commenters raised the concern that the proposed critical habitat for the Snail could somehow reduce or eliminate the volume of water being diverted from streams and used to drive existing hydropower plants and irrigate farm lands. With the modifications in habitat boundaries, these diversions are now outside of and downstream from the proposed critical habitat boundaries. Thus, the existing stream diversions would not be affected. In turn, this eliminates the possibility of any impacts of the critical habitat designation on hydropower plants and farms that depend on diverted water.

3.b. Impacts on Hydropower and Property Values, Wainiha Valley

The DEA indicates that there are no specific plans for new hydropower development that would affect the proposed critical habitat for the Snail. It also indicates that such development is unlikely in the next 10 years, given existing environmental protections and the recent history of hydropower development on Kaua'i. No hydropower plants have been developed in recent years due to environmental protections and concerns, community opposition to stream diversions, and the resulting difficulties in obtaining approvals and permits. Nevertheless, some commenters expressed concern that the proposed critical habitat could reduce the probability of additional hydropower development in Wainiha Valley which could, in turn, reduce the property value of the valley. Also, new information was provided on a hydropower plant that had been planned for Wainiha Valley in the early 1980s upstream of the existing hydropower plant. The concern expressed by the commentors is addressed below.

3.b.(1) Existing Hydropower Plant

As mentioned in the DEA, a hydropower plant already exists on the Wainiha River. At 3.8 megawatts (MW) and in operation since 1906, it is the largest and oldest hydro-power plant on Kaua'i. The weir (stream diversion) for this plant is at the 700-foot elevation, which is about one mile downstream of the proposed Snail critical habitat. The hydropower plant and associated ditch system, substation, access road, and transmission lines are downstream of the weir. Critical habitat designation would not affect the operation of this hydropower plant.

3.b.(2) Planned Hydropower Plant, Early 1980s

In the early 1980s, Alexander & Baldwin, Inc. (A&B) planned a second hydro-power plant in Wainiha Valley. A&B obtained all the necessary government approvals and permits, and secured a contract with Kaua'i Electric to sell the power to them. However, A&B did not proceed with the project because they decided to invest in a coffee venture instead.

Plans for this hydropower plant would be similar in concept to the existing 3.8-MW plant. Relevant features include:

— Diversion Weir

A new weir would be built at an elevation of about 1,140 feet, or about 2.1 miles upstream of the existing weir. Its crest would be about 160 feet long and 14 feet above the riverbed. A maximum of 150 cubic feet per second (cfs) of water would be diverted, compared to 100 cfs for the existing hydropower plant. Volumes exceeding this amount would flow over the weir and through the natural river channel. The weir would be notched to allow a continuous flow of at least 1 cfs into the river.

— Water Conductor

Water would be diverted into a 48-inch-diameter pipe that would carry the water 2.1 miles downstream. The pipe would be supported about 4 feet above the ground along most of its path.

— Access Road

A new, 12-foot-wide gravel access road would extend 2.1 miles upstream of the end of the existing valley road.

— Power House, Substation and Switch Yard

A power house would be situated immediately upstream of the existing weir and about 200 feet from the stream channel. It would house two turbines and a 1.15-MW generator. Energy production has been estimated at 20 million kilowatt-hours (kWh) per year. A substation and switch yard would adjoin the power house.

— Transmission Line

A new overhead transmission line about 3 miles long would connect the new hydropower plant to the existing one.

If this project were built today, the diversion and portions of the road, water conductor, and the dewatered riverbed would be within the proposed critical habitat for the Snail.

3.b.(3) Required Approvals and Permits

All of the approvals and permits that were obtained for the project in the early 1980s have since expired, and new laws require additional approvals and permits. Therefore, in order to proceed with the project, the following approvals and permits would have to be obtained:

— Federal

- Army Corps of Engineers (ACOE) section 404 permit
- Federal Energy Regulatory Commission (FERC) declaration of intent (This may not be required if it is determined that the project would not affect interstate commerce or navigable waters.)

— State

- Board of Land and Natural Resources approval of a conservation district use application
- Department of Health section 401 water quality certification
- Acceptance of a State Environmental Impact Statement (EIS)
- Commission on Water Resource Management (CWRM) stream-diversion permit
- CWRM stream channel alteration permit
- CWRM amendment to interim in-stream flow standards

- Public Utilities Commission approval of an energy contract to allow Kaua'i Electric to purchase the energy

— County

- Department of Public Works (DPW) grading permit
- DPW building permit

The three permits from the CWRM are new requirements since the early 1980s; the remaining ones were required then.

3.b.(4) Environmental Studies

Even though most of the above approvals and permits were required in the early 1980s, some agencies are now likely to require that more in-depth environmental studies. In particular, given the high quality of the fauna in the Wainiha River and increased environmental concerns, it is likely that studies will be expected to address the impact of the hydropower project on aquatic and riparian species and ecosystems. Major issues are likely to include:

- The physical barrier the weir presents to aquatic species that travel downstream or upstream during different stages of life in order to feed or reproduce.
- The entraining of small aquatic species that pass through screens into the diversion system.
- The change in river quality downstream of the weir due to decreased flow (i.e., higher water temperatures, higher pH, less dissolved oxygen in the river, etc.).
- Increased turbidity of the river during construction of the weir, road, conductor pipe, power plant, etc., due to soil runoff.

3.b.(5) Community Support for Hydropower

During the planning and permitting process in the 1980s, there was more community support and less opposition to the Wainiha hydropower project than there was for other proposed hydropower projects on the Wailua, Lumaha'i and Hanalei Rivers because portions of the Wainiha Valley were already disturbed due to the existing diversion, power house and road. Thus, A&B was able to secure all of the necessary approvals and permits for the Wainiha project while none of the other projects were successful.

Even though hydropower would reduce dependence on fossil fuels, many residents no longer favor it as a renewable energy source due to potential adverse environmental impacts. Thus, if a hydropower plant is again proposed for the Wainiha River, stronger community opposition is likely.

3.b.(6) Outlook for Obtaining Approvals and Permits

Based on discussions with government and private planners involved with obtaining approvals and permits for hydropower plants, the following assessments were made regarding a hydropower project in Wainiha Valley:

- The cost of the environmental approvals and related studies would range from \$300,000 to over \$600,000, with a best estimate of \$500,000.
- The approval process would take at least two years and possibly over four years.
- The probability of obtaining all required approvals and permits is on the order of 10 percent or less.
- If approved, it is likely that conditions would be imposed to maintain a significant minimum stream flow and to mitigate any adverse impacts on aquatic species.

Compared to the project as originally planned, the effect of the last item would be to:

- Reduce the volume of water diverted and the amount of energy produced, especially during periods of low river flow (each loss of 1 cfs of water translates into an annual energy loss of about 250,000 kWh).
- Possibly lower the price of the energy sold because the supply of energy would not be reliable (i.e., energy production would drop off during periods of low river flow).
- Lower revenues because of lower production and possibly a lower energy price.
- Increase development costs and/or operating costs due to required measures to mitigate impacts on aquatic species.

3.b.(7) Demand for Additional Energy

As discussed in the DEA, Kaua'i Electric recently invested in a very efficient 26.4-MW steam-injection combustion turbine power plant. This plant is designed to meet the projected demands for electrical energy on the island for the next 10 years or more.

Nevertheless, Kaua'i Electric would be willing to purchase energy from a new hydropower plant, but the energy price would be based on their relatively low surplus energy rate (about 7 cents per kWh), which reflects avoided fuel costs but not capital costs. The low rate reflects the fact that run-of-the-river hydropower requires backup capacity because energy production falls off when streamflow is low. Also, as mentioned above, Kaua'i Electric has adequate generating capacity.

3.b.(8) Profitability of Hydropower Development

In 1984, an economic analysis of the proposed hydropower plant was performed which addressed capital costs (about \$13.18 million), operating costs (about \$84,000 per year), revenues (about \$1.26 million per year), tax credits, taxes, etc. This analysis revealed that the project would be profitable: the present value of the projected after-tax cash flow was estimated at about \$800,000 in 1984 dollars. The property value of Wainiha Valley would be enhanced by approximately this same amount because of the potential for hydropower development, along with the approvals and permits that were in place.

For this Addendum, the 1984 analysis was updated to 2002 conditions as follows:

- Credit was given for past planning and studies that would still have value, while the cost of new permitting requirements was added.
- Construction and operating costs were increased 77.6 percent to reflect cumulative inflation since 1984.
- Energy prices were increased 21 percent to current values (note that energy prices increased far less than inflation).
- The inflation outlook was reduced from 5 percent to 2 percent.
- Tax credits were eliminated since they are no longer available for hydropower projects (in terms of 2002 dollars, this reflects a loss in income of about \$4.4 million).
- Federal and State corporate income-tax rates were reduced to current rates.

- The discount rate was approximately halved to reflect the current rate used by A&B (this much lower discount rate reflects the lower interest rates that are now available).

Based on these changes to the 1984 economic analysis, hydropower development is no longer economically feasible: the present value of the after-tax cash flow is now negative, even assuming required approvals and permits are received. The primary reasons for this negative assessment include:

- High construction costs to build (in this deep and remote valley) an access road to the diversion site, a stream diversion, the pipe to carry the water, the hydropower plant, and a power line to transmit the energy out of the valley.
- A loss of previous tax credits for hydropower projects.
- Past increases in energy prices that were slower than general inflation.
- Slower inflation in future energy prices than what was originally projected.

If the hydropower project were approved subject to the previously discussed conditions, then the conditions placed on the approvals and permits would further add to the economic infeasibility of the project. There is also a high risk that funds would be expended for planning, engineering, environmental studies, public outreach, and permitting, only to have the project denied in the end.

3.b.(9) Summary

Even without the Snail critical habitat, the probability of obtaining required approvals and permits for hydropower development in Wainiha Valley is low. And even assuming that required approvals and permits will be received, additional hydropower development in Wainiha Valley no longer appears to be economically feasible. Thus, there is little potential for additional hydropower development in Wainiha Valley, with or without critical habitat. In turn, this limited potential adds little to the current property value of Wainiha Valley.

In view of this assessment, critical habitat designation would not have a significant effect on the already low probability of hydropower development in Wainiha Valley. Consequently, the designation would not significantly reduce the property value of the valley.

3.c. Loss of Conservation Projects, Wainiha Valley

The proposed 566-acre Wainiha Valley Unit II(a) is located within a long narrow river valley. Most of the valley (10,120 acres), including all of Unit II(a), is owned by A&B. Under an agreement with A&B, the valley is managed for conservation by the State Department of Land and Natural Resources (DLNR), primarily to conserve watershed resources for the continued production of hydropower in the lower valley. In addition, A&B has informed the Service that they are negotiating with The Nature Conservancy of Hawaii (TNCH) to have TNCH manage the valley for both watershed protection and conservation.

Since A&B owns most of the Wainiha Valley, conservation efforts will involve a substantial level of voluntary cooperation with them in order to conduct biological surveys, carry out experimental translocation of the Snail to establish populations in the unoccupied Wainiha River, and develop a Safe Harbor Agreement in the event that the Snail is reintroduced into this unoccupied river.

As one of Hawai'i's larger private landholders, A&B has a history of working cooperatively with the Service, the State, and other organizations to implement voluntary conservation projects and activities on their lands. Without critical habitat designation, A&B is open to land management by TNCH that may involve conservation needs of the Snail and listed plants, as long as the operation of A&B's existing hydropower plant is not compromised and downstream neighbors agree that their interests will not be adversely affected (see Section 3.d.1).

However, A&B is concerned about possible long-term indirect impacts of critical habitat designations. Because of their concerns, A&B has indicated that the designation for the Snail would have a negative impact on their future cooperation on voluntary conservation efforts in Wainiha Valley. As noted by A&B, critical habitat designation is meaningful for this unoccupied unit only if A&B and affected downstream landowners agree to relocate Snails into the Wainiha River. However, with critical habitat designation, A&B judges that the needed cooperation is unlikely.

Thus, designation of critical habitat in Wainiha Valley poses a high risk of a losing conservation projects that would otherwise occur, along with the corresponding loss of potential environmental benefits.

3.d. "Taking" of a Threatened Species

A number of commenters expressed concern over the possibility that some Snails could move upstream or downstream and enter the intake of a power plant or an irriga-

tion ditch, thus resulting in an inadvertent but costly illegal “taking” of a listed species. This issue is discussed below for each of the proposed critical habitat units.

3.d.(1) Unoccupied Critical Habitat Units

The taking issue was discussed in the DEA under the assumption that the owner of Wainiha Valley (and of the downstream hydropower plant) would voluntarily agree to host a Snail translocation project in this unoccupied unit. If the landowner is receptive, a translocation project is likely to proceed only if the landowner also has agreements with the Service and DLNR to allow an “incidental take” in the event that some of the Snails are dislodged and move downstream and enter the intake of the power plant, or to allow any other inadvertent take by a downstream user. But if the landowner is not receptive to a translocation project, then the issue of a possible illegal take is irrelevant since the Wainiha River is believed to be unoccupied by the Snail.

Two other units are unoccupied by the Snail: Hanakoa Stream and Hanakapa'ai Stream, both of which are on the Na Pali Coast. These units, and the areas upstream and downstream of them, are managed for conservation by the State as part of the Na Pali Coast State Park and the Hono o Na Pali Natural Area Reserve. Translocation projects in these streams are unlikely to result in an illegal take inasmuch as these streams are free-flowing and will remain free-flowing: there are no existing or planned stream diversions, hydropower plants, modern irrigation ditches, or farming activities along these streams.

3.d.(2) Occupied Critical Habitat Units

All of the remaining units are occupied by the Snail. The Kalalau Stream unit is under the same land and stream management as the other two Na Pali Coast streams: it is a free-flowing stream with no existing or planned stream diversions, hydropower plants, modern irrigation ditches, or farming activities. Also, the Lumaha'i River has no power plants, no stream diversions, no farming activity upstream of the critical habitat unit, and little or no farming activities downstream of the unit.

The Hanalei River and the Makaleha Stream have irrigation ditch diversions about 6 miles and 1 mile downstream of the proposed critical habitat units, respectively. At these lower elevations, the Service indicates that the Hanalei River and Makaleha Stream are unlikely to support the Snail for biological reasons (i.e., inadequate flow velocity, insufficient dissolved oxygen, etc.).

The North Fork Wailua River has a small dam (i.e., the Blue Hole stream diversion) at the boundary of the critical habitat, as modified. This dam diverts water into a major

ditch system that also receives diverted flow from a number of nearby streams. This ditch system first delivers water to drive a hydropower plant, next to a second hydropower plant, and then to a number of downstream farms. Similarly, Waipahe'e Stream has a small dam near the boundary of the proposed critical habitat, as modified, that diverts water into an irrigation ditch system.

For these two occupied units, the risk of an inadvertent take of the Snail already exists: with or without critical habitat designation, some Snails could dislodge and move downstream and enter the intake of a ditch system. However, if the critical habitat designation leads to one or more recovery projects in these occupied units, and the recovery projects in turn lead to increased Snail populations, then the higher populations might increase the probability that some of the Snails could move downstream and enter an intake. Thus, critical habitat designation might indirectly increase the probability of an inadvertent take of the Snail. Also, critical habitat designation could bring attention to the possibility of an illegal take.

However, Service biologists believe that there is an extremely small probability that a take would occur or could be detected, with or without critical habitat. This is primarily because Snails are likely to be swept downstream only during major rainstorms when river and stream flows increase in volume and velocity and create sufficient turbulence and force to dislodge Snails. During these rainstorms, nearly all of the river and stream flows wash over the small diversion dams. Thus, the Service believes that all or nearly all Snails that do become dislodged are swept over the diversion dams and not into the diversion ditches. Most of the dislodged Snails would be expected to die of natural causes, either before or after being swept over the dam. However, some surviving Snails could become established in tributaries downstream of the diversion dams since both the North Fork Wailua River and the Waipahe'e Stream are fed by springs and small tributaries downstream of the dams.

Even if dead Snails were found in the ditch systems, the Service would have a difficult burden proving that they were alive when they entered the system and died because they were diverted into the ditches.

3.d.(3) Summary on Taking

In view of the above, there is an extremely small probability that the proposed critical habitat designation would contribute to an inadvertent take of the Snail.

3.d.(4) Other Costs

Some reviewers commented that the DEA did not address or did not adequately consider a variety of costs that they believe could occur due to the Snail listing or its critical habitat designation. Of particular concern are impacts that could occur as a result of possible interpretations of State law as they relate to lands and streams designated as critical habitat.

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 modifications to the proposed critical habitat.

To clarify further, the following economic impacts are not expected to occur due to the critical habitat designation as modified by the Service (see Section 2 above):

- Risk of land being redistricted from the State Agricultural, Rural, or Urban District to the Conservation District, resulting in restrictions on land use and losses in property values.

Such redistricting is not possible since all of the land proposed for critical habitat is already in the State Conservation District (see Table I-1 of DEA).

- Adverse impacts on farming and ranching operations as well as on property values

This is not a possibility since no agricultural land is proposed for critical habitat. (Also see comments below regarding concerns over diversion of irrigation water.)

- 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.

These impacts are not expected since, as discussed in the DEA, no development projects are likely to occur in the proposed critical habitat. This reflects the facts that (1) the subject land is largely unsuitable for development due to the rugged mountain terrain, lack of access, and remote location; and (2) existing land-use controls in the Conservation District severely limit development.

Regarding concerns about how critical habitat would affect developments that require Special Management Area (SMA) permits, it should be noted that none of the proposed critical habitat is within the SMA.

- Risk of required modifications to stream diversions in order to restore stream flows, resulting in (1) a loss of irrigation water to farmers and ranchers, and a related loss of existing and potential farm and ranch production; and (2) a loss of water to drive hydropower plants and a related loss of alternative (non-oil) energy production.

This is not possible since no current stream diversions nor areas downstream from the diversions remain in the critical habitat as modified.

- Increased difficulty in obtaining approvals for new stream diversions to drive new hydropower plants, resulting in a potential loss of alternative energy production and, for some private lands, a potential loss in property values.

As discussed in the DEA, no known plans exist for new stream diversions in the subject areas. Furthermore, even without critical habitat, development of new stream diversions in these areas is regarded as highly unlikely, given current environmental concerns, likely public opposition to stream diversions, and difficulties in obtaining permits.

Concerns specific to Wainiha Valley are addressed above.

- Increased difficulty in obtaining approvals for new stream diversions to supply more irrigation water to farms, resulting in a loss of potential crop production.

As discussed in the DEA, no known plans exist for new stream diversions in the subject areas. And, even without the Snail critical habitat, development of new stream diversions in these areas is regarded as highly unlikely, given current environmental concerns, likely public opposition to new stream diversions, and difficulties in obtaining permits.

Furthermore, it is unlikely that new stream diversions will be needed to increase the supply of irrigation water given that (1) the recent closure of sugar plantations on Kaua'i freed large volumes of irrigation water for other agricultural activities, and (2) replacement agricultural activities use far less water than sugarcane. Some of the former sugarcane lands have been replanted in diversified crops which generally use about half as much water per acre as sugarcane. However, most of the former sugarcane lands are now used for grazing cattle on lands that are no longer irrigated.

- Increased restrictions on developing (potable) water resources, resulting in higher water costs and adverse impacts on affordable housing and the visitor industry.

This is not a realistic possibility. Most potable water on Kaua'i is supplied from groundwater sources since it does not require expensive treatment. The critical habitat will have no adverse effects on groundwater recharge and so will not reduce the sustainable yield from the aquifer. Also, the critical habitat units are in areas that are far removed from where new wells are likely to be developed.

And if needed, a small amount of the excess surface water (see previous item) could be used to supply new residential and resort areas. As discussed, existing stream diversions will not be affected adversely by the proposed designation.

- Restrictions on access to public lands, resulting in socioeconomic costs.

Designation of critical habitat would impose no restrictions on access to public lands. However, as noted in the DEA, hiking to these lands is difficult due to their remote locations in the upper reaches of streams and rivers in the mountainous interior of Kaua'i; some of the units are accessible only by helicopter and are rarely visited.

- New obligations on how private landowners manage their lands.

While this impact is not expected, this possibility and the cost of land and stream management to control threats to the Snail are addressed in the DEA.

4. COSTS TO SMALL ENTITIES

The DEA presents a brief analysis of the small entities that would be potentially affected by the proposed Snail critical habitat. One commenter requested a more detailed accounting of how it was concluded that "...the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities." Presented below is a more detailed analysis of the impact of the critical habitat on small entities.

4.a. Activities and Entities Potentially Impacted

The DEA addresses all foreseeable projects, activities, land uses and entities that could be affected by the proposed critical habitat. Based on the DEA and on the pro-

posed critical habitat as modified, the list below presents the projects, activities, and land uses that could be impacted by critical habitat (Table Add-1), and the entities associated with these impacts organized by type of activity:

— **Management of Game Hunting:**

Federal: Service

State: DLNR

— **Conservation Projects:**

Federal: Service

Non-Profit: TNCH; the Waipa Foundation; Kauai watershed partnership

— **Natural Disaster Recovery Projects:**

Federal: Service; Federal Emergency Management Agency (FEMA)

— **Property Values:**

Business: A&B, Cornerstone Kaua'i Holdings, Inc.

Non-Profit: Kamehameha Schools

— **Investigating the Implications of Critical Habitat:**

Federal: Service

Business: A&B, Cornerstone Kaua'i Holdings, Inc.

Non-Profit: Kamehameha Schools

4.b. Small Entities Potentially Impacted

The Regulatory Flexibility Act (RFA) of 1996 (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA)) considers “small entities” to include small governments, small organizations, and small businesses (5 U.S.C. §601). The following discussion examines each entity potentially impacted from the list above to determine whether it would be considered “small” under the RFA/SBREFA.

4.b.(1) Federal Agencies

For the purposes of the RFA/SBREFA, Federal agencies are not considered small governments. Thus, the Service (which is involved in all section 7 consultations) and FEMA (which may be involved in natural disaster recovery projects) are not considered further in this portion of the economic analysis.

4.b.(2) State Agencies

For the purposes of the RFA/SBREFEA, State governments are not considered small government jurisdictions. Thus DLNR (which is likely to be involved in a section 7 consultation on the management of game hunting) is not considered further in this portion of the economic analysis.

4.b.(3) Businesses

Critical habitat designation might impact A&B and Conerstone Kaua'i Holdings, Inc. This would occur in terms of a slight decrease in the value of some land they own in the Conservation District, and possibly expenditures on services to investigate the implications of critical habitat.

A&B's primary business activities are food products, real estate, and ocean transport—none of which will be impacted by critical habitat designation. The SBA defines a business in the food products industry as small if its annual sales are less than \$750,000; it defines a business in the real estate industry as small if its annual sales are less than \$6 million; and it defines a business in the ocean transport industry as small if its annual sales are less than \$18.5 million. According to these definitions and the financial statements included in A&B's 2001 Annual Report, A&B is not a small business. A&B's revenues in 2001 totaled \$1.19 billion, of which about \$106 million was from food products; about \$159 million was from real estate; about \$787 million was from ocean transportation; and about \$138 million was from interest, dividends, and the sale of investments.

The principal business activity of Conerstone Kaua'i Holdings, Inc. is marketing large home lots (over 5 acres) as part of a 300-acre, 28-lot subdivision called Kealia Kai—a project which will not be impacted by critical habitat designation. The U.S Small Business Administration (SBA) defines businesses in the land-subdivision and land-development industry as small if their annual sales are less than \$6 million. Recent real estate sales data indicate that, according to this definition, Conerstone Kaua'i Holdings, Inc. is not a small business (personal communication, Blue Hawai'i Properties, Inc.).

4.b.(4) Not-for-Profit Organizations

The RFA/SBREFEA defines "small organization" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field (5 U.S.C. §601).

TNCH (which is likely to be involved in section 7 consultations on conservation projects) is a large organization that is dominant in the conservation and land management field in Kaua'i County. Thus, TNCH is not likely to be considered a small organization.

The Waipa Foundation may also be involved in section 7 consultations on conservation activities. It is a small community-based corporation and is likely to be considered a small organization under the RFA/SBREFEA definition.

A watershed partnership is likely to be formed on Kaua'i in the next 10 years. If this partnership seeks Federal funding, it may be involved in a section 7 consultation on conservation activities. Since this will be the only island-wide watershed partnership on Kaua'i, it is likely to be dominant in its field and thus is not considered a small organization.

As a result of critical habitat, Kamehameha Schools may be impacted in terms of a slight decrease in value of some land it owns in the Conservation District and possibly expenditures on services to investigate the implications of critical habitat. Kamehameha Schools is the largest charitable trust in Hawai'i, as well as the State's largest private landowner; it also has a substantial investment in securities and owns real estate in other states. In 2001, Kamehameha Schools had over \$1 billion in revenues, gains, and other support (Kamehameha Schools, 2001). Thus, it is not likely to be considered a small organization.

4.c. Summary: Potential Impacts on Small Entities

The only small entity that may be impacted by the designation of critical habitat is the Waipa Foundation. The DEA states that the Waipa Foundation could be impacted if Kamehameha Schools enters into an agreement with TNCH and the Waipa Foundation to manage the Lumaha'i Valley for conservation and educational and cultural benefits. TNCH and the Waipa Foundation may seek funding from the Service to manage the valley, in which case the Service may conduct an internal consultation with a low level of complexity. TNCH and the Waipa Foundation could be involved in the consultation process, but their involvement would not be mandatory.

The DEA states that the average cost of time and effort expended for a third-party applicant for a consultation with a low level of complexity is \$1,400. A significant portion of this cost is likely to be borne by TNCH, since it has prior experience obtaining Federal funding for conservation efforts. In addition, Kamehameha Schools and possibly other organizations are likely to provide funding to the Waipa Foundation to help cover some or all of the costs incurred during consultation. Thus, the designation of critical habitat for the Snail is not likely to have a significant economic impact on the Waipa Foundation or any other small entity.

5. SECTION 7-RELATED BENEFITS

5.a. Introduction

There is little disagreement in the published economics 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 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 Snail critical habitat. For example, most of the studies in the economics literature do not allow for the separation of the benefits of listing (including the Act's take provisions) from the benefits of critical habitat designation. 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.

5.b. Benefits to Other Native Aquatic Species

Based on the assumption that critical habitat for the Snail would help ensure that cool, clean water will flow perennially in designated streams, several commenters suggested that the discussion on benefits should be expanded to include other native aquatic species that would benefit from healthy streams and stream life.

Regarding other native aquatic species, the Service believes that five species of concern (four snails and one fish) and one candidate species (a damselfly) may occur within the critical habitat boundaries for the Snail. As more is learned about these species (e.g., their populations and trends, ranges, threats to their survival, etc.), the Service may list one or more of them as threatened or endangered. The aquatic Species of Concern (SOC) and Candidate species (C) that occur within the Snail proposed critical habitat are listed below.

<u>Name</u>	<u>Common Name</u>	<u>Type</u>	<u>Status</u>	<u>In CH?</u>
<i>Neritina granosa</i>	<i>Hihiwai</i>	Snail	SOC	Yes
<i>Lymnaea aulacospira</i>	NCN	Snail	SOC	Yes
<i>Lymnaea producta</i>	NCN	Snail	SOC	Yes
<i>Lymnaea rubella</i>	NCN	Snail	SOC	Yes
<i>Megalagrion xanthomelas</i>	NCN	Damselfly	C	Possible
<i>Lentipes concolor</i>	<i>O'opu alam'o</i>	Goby fish	SOC	Yes

* NCN = No common name.

Source: U.S. Fish & Wildlife Service.

As indicated in the DEA, the critical habitat designation and listing of the Snail are expected to result in few or no modifications to projects or activities over the next ten years. Nevertheless, critical habitat designation may help to educate landowners and organizations about the locations of the Snail and where to focus future conservation efforts, including efforts to control non-native predators. Thus, critical habitat designation may indirectly enhance the survival of other native aquatic species that share the same habitat as the Snail. If the Service determines that one or more of these species does not need to be added to the threatened and endangered species list, the avoided cost (i.e., economic benefits) could be large.

However, the economic value of these indirect benefits to other native aquatic species is not quantified because of a lack of information on: (1) the nature and extent of future conservation projects due to the Snail listing and its critical habitat designation, or enhancements to other conservation projects due to the Snail; (2) the resulting improvements in stream quality; (3) the nature and extent of the benefits to other native aquatic species (e.g., increases in their populations and ranges); (4) the reduced probability that one or more other species will be listed; (5) the avoided cost of the listing and designation of critical habitat; and (6) the economic value to society of enhanced survival of these species.

5.c. Other Environmental Benefits

Some commenters further suggested that the critical habitat designation for the Snail will help protect intact native ecosystems, including native forest in the watershed where the Snail is found. In turn, they suggest that this protection will promote groundwater recharge (i.e., less runoff of rainwater), maintain stream water quality (e.g., less soil loss into streams), prevent siltation of nearshore reefs and other marine resources,

combat global warming, provide recreational opportunities, attract ecotourism, and so on.

While these benefits were considered for inclusion in the DEA, they were not discussed because they are expected to be small.³ This expectation is based on the following:

- For islandwide impacts, such as water recharge, the proposed Snail critical habitat comprises a comparatively small area—less than 3 percent of the mountainous interior of Kaua'i.
- As indicated in the DEA, the proposed critical habitat is not subject to development pressures or other significant changes because it is located in the upper reaches of streams and rivers in the mountainous interior of Kaua'i. Much of the proposed critical habitat has steep slopes, remote locations, and difficult access; some of the units are accessible only by helicopter and are rarely visited. Also, all of the units are in the State Conservation District which severely limits development, most commercial activities, and most changes in land use.
- Assuming no Snail listing and no critical habitat designation, no significant changes are expected in watershed, riparian, or stream conditions.
- Even with the species listing and critical habitat designation—along with related efforts to control threats to the Snail, anticipated changes in game-mammal management of surrounding lands (the most liberal hunting is already allowed in these areas in order to reduce ungulate populations), and other related land and stream management—no significant changes to the watershed, riparian, or stream conditions are expected.

Thus, critical habitat designation for the Snail is expected to result in few benefits related to increased groundwater recharge, stream water quality, reduced siltation of nearshore reefs and other marine resources, reduced global warming, increased recreational opportunities, increased ecotourism, etc.

3. These benefits are addressed in the economic analyses of proposed critical habitat for listed plants in Hawai'i, since the benefits are expected to be significant, assuming that threats are controlled.

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

Some commenters suggested that a 1999 analysis by University of Hawai'i (UH) economists on the total value of environmental services 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 Snail critical habitat designation 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 Snail critical habitat on the island of Kaua'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 designations.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the Snail 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 9 percent larger than Kaua'i but has a population of more than 12 times that of Kaua'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 Wai Cannel. 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 Snail critical habitat. As mentioned previously, the Snail critical habitat units are located in the upper reaches of streams and rivers in the mountainous interior of Kaua'i. Much of the proposed critical habitat has steep slopes, remote locations, and difficult access; some of the units are accessible only by helicopter and are rarely visited.

6. SUMMARY OF ECONOMIC IMPACTS

Table ES-1 of the DEA, which is duplicated as Table VI-2 in Chapter VI, presents the costs and benefits attributable to the Snail listing and proposed critical habitat designation. Table Add-1 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 areas the Service has indicated will be removed in the final rule. Table Add-1 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 no change in the total costs or to the shares attributable to critical habitat. As discussed above, in-depth analysis of certain issues resulted in little or no change to the original findings.

However, two major changes should be noted, even though they are not valued due to a lack of relevant data. First, critical habitat designation is likely to result in fewer conservation projects in Wainiha Valley than would be the case with no designation, resulting in a loss of potential environmental benefits (i.e., a cost). Second, conservation efforts for the Snail will benefit other aquatic species.

Finally, the potential for other environmental benefits is acknowledged (increased groundwater recharge, stream water quality, reduced siltation of nearshore reefs and other marine resources, reduced global warming, increased recreational opportunities, increased ecotourism), although these benefits are expected to be small.

**Table Add-1. Revised Section 7 Costs and Benefits Attributable
to the Newcomb's Snail Listing and Critical Habitat
(10-year estimates)**

DEA = Draft Economic Analysis CH = critical habitat C&PM = consultation & project modification ne = not estimated

Item	DEA		Addendum		Explanation
	Total	Share to CH	Total	Share to CH	
DIRECT COSTS (cost of C&PM)					
Management of Game Hunting					
State-managed land	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	
Private lands	None	None	None	None	
State Parks	None	None	None	None	
Conservation Projects					
Partners for Fish & Wildlife Projects	\$ 3,800	\$ -	\$ 3,800	\$ -	
The Nature Conservancy of Hawai'i (NCH) and Waipa Foundation Projects	\$10,400	\$ 5,200	\$10,400	\$ 5,200	
Watershed Partnership Projects	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	
Water Systems					
Operations & Maintenance (O&M)	None	None	None	None	
New Stream Diversions and Irrigation Ditches	None	None	None	None	
Hydropower	None	None	None	None	
Ecotourism Operations	None	None	None	None	
Natural Disaster Recovery Projects	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	
INDIRECT COSTS					
Land Management	None	None	None	None	
Loss in Property Values	Small	Small	Small	Small	
Investigate Implications of Critical Habitat	\$13,500	\$13,500	\$13,500	\$13,500	
Existing Stream Diversions for Hydropower and Irrigation	\$ -	\$ -	\$ -	\$ -	Diversions removed from CH.
Reduced Potential for Hydropower Development, Wainiha River	\$ -	\$ -	\$ -	\$ -	Unlikely development, even without CH.
Loss of Conservation Projects, Wainiha Valley	ne	ne	ne	ne	Loss of potential environmental benefits, Wainiha Valley
Illegal Take of a Snail	\$ -	\$ -	\$ -	\$ -	Extremely low probability.
BENEFITS					
Increase in Ecotourism	Small	Small	Small	Small	
Benefits of Preserving the Snail	ne	ne	ne	ne	
Benefits to Other Native Aquatic Species	\$ -	\$ -	ne	ne	Potential for additional species preservation benefits.
Other Environmental Benefits	\$ -	\$ -	Small	Small	Small improvements expected.
TOTAL					
Costs	\$33,700	\$24,700	\$33,700	\$24,700	
Benefits	ne	ne	ne	ne	

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Information was provided in communications with representatives of:

- Alexander & Baldwin, Inc.
- Blue Hawai'i Properties, Inc.
- Commission on Water Resource Management
- Conerstone Kaua'i Holdings, Inc.
- Department of Business, Economic Development and Tourism, Energy Resources and Technology Division

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- East Kaua'i Water Users Cooperative
- Kaua'i Electric
- Planning Solutions, Inc.
- U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office