

BENJAMIN J. CAYETANO
Governor of Hawaii



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File No. MO-2742

MAR 13 1995

MEMORANDUM

TO: Gary Gill, Director
Office of Environmental Quality Control

FROM: Michael D. Wilson, Chairperson *Michael D. Wilson*

SUBJECT: Negative Declaration for Restoration and Operation of 17 Coastal Fishponds on Molokai

The Department of Land and Natural Resources has reviewed the comments received during the 30-day public comment period that began on December 23, 1994. The Department has determined that this project will not have significant environmental effect and has issued a negative declaration. Please publish this notice in the next OEQC BULLETIN.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final EA.

Please contact Don Horiuchi at 587-0381 if you have any question.

Encl.

Chairperson
MICHAEL D. WILSON
Board of Land and Natural Resources

Deputy Director
GILBERT COLOMA-AGARAN

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25

1995-03-23-HO-PEA-Molokai 17 Fishpond 3-23-95

~~20-0-95~~

Repair, Reconstruction and Maintenance

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**FINAL ENVIRONMENTAL ASSESSMENT
FOR
REPAIR, RECONSTRUCTION, MAINTENANCE, AND USE
OF MOLOKA'I FISHPONDS**

This document is prepared pursuant to Chapter 343, Hawaii Revised Statutes and is financed, in part, by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, United States Department of Commerce, through the Office of State Planning, State of Hawaii.

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SECTION 1
DESCRIPTION OF THE PROPOSED ACTION

Activity and Purpose

This is an application for a Master Conservation District Use Permit to cover twelve State-owned fishponds on Moloka'i. Its purpose is to expedite the historically accurate restoration of Hawaiian fishponds by community groups for traditional 'ohana-based management. The twelve ponds that are included in this application have been selected based on a number of criteria. It is anticipated that the Master permit will be amended in the future to include additional fishponds on Moloka'i and other islands that meet these criteria.

Location

The fishponds are located in the nearshore waters of Moloka'i. The ponds and their respective tax map keys are listed in Exhibit 1, and referenced in an index map (Exhibit 2).

Project Background

Hawaiian fishponds and fishtraps are a unique cultural resource and food production system developed and refined by pre-Western and post-Western contact Hawaiians. Fishponds have declined Statewide in importance and value as result of many contributing factors. On Moloka'i the situation is particularly acute. The cultural and natural resource value of these fishponds to the Hawaiian community and the fishpond 'ohana has been progressively lost as a result of structural damage to the fishpond wall by recent and historic tsunami and storm waves, regulatory obstacles, and general neglect of this unique coastal and cultural resource.

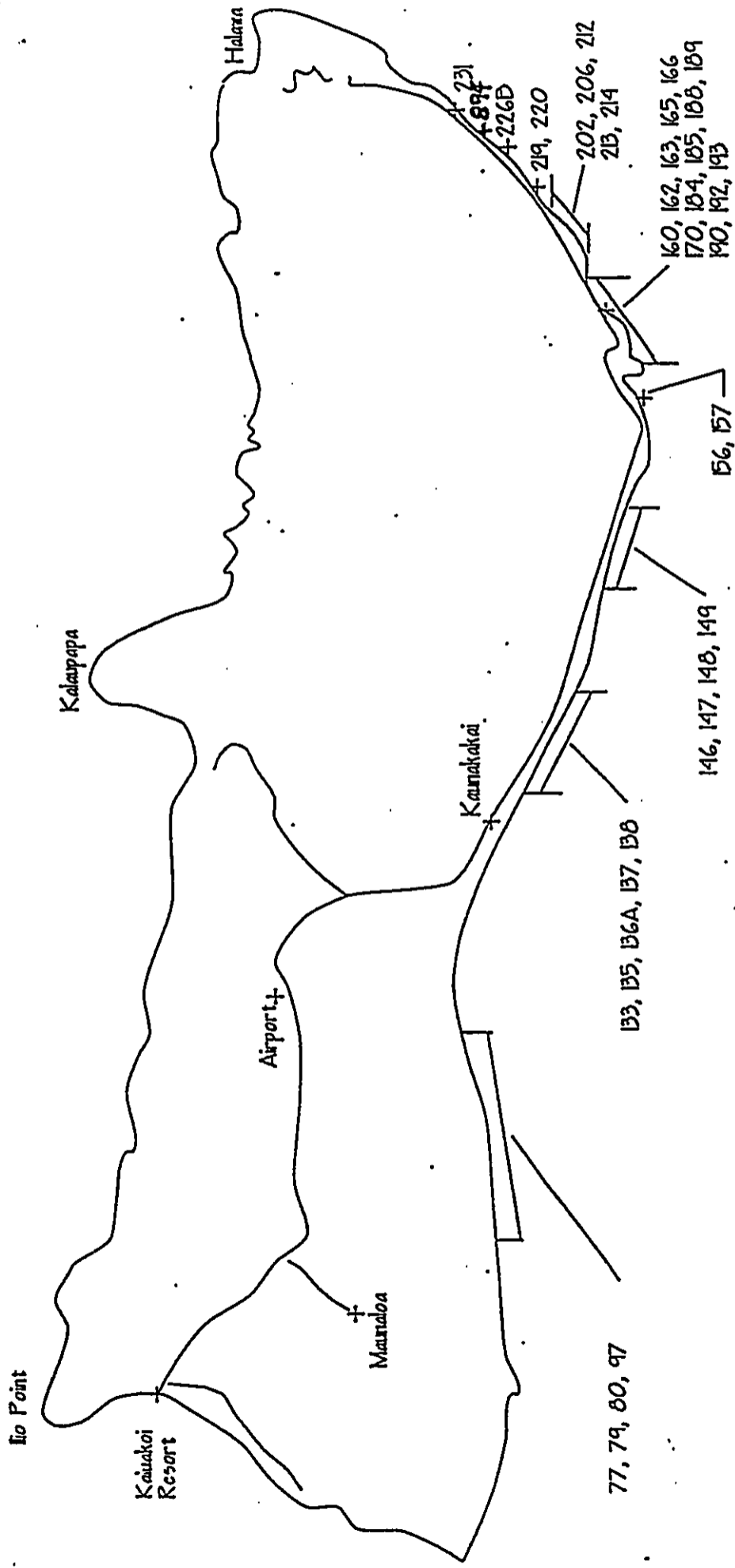
Among the factors accounting for the decline in Hawaiian fishpond use on Moloka'i are the following: 1) changing seafood markets and consumer demand; 2) infilling of ponds by silt as a result of agricultural runoff combined with poor soil and range management practices, and upland wind and water erosion exacerbated by overgrazing of domesticated and feral animals; 3) improperly designed stormwater and flood control channels; 4) destruction of fishpond walls by tsunami and regional tropical cyclonic storm events; 5) reclamation of ponds as a result of mangrove introduction and spreading; 6) changing land use practices; and 7) Federal, State, and County regulatory obstacles to fishpond reconstruction.

The Governor's Task Force on Moloka'i Fishpond Restoration (the Task Force) was established in 1991 to reverse the loss of these important cultural and archaeological resources, and the impact of this loss on the traditions of the Hawaiian community. Among the objectives of the Task Force were a community-based fishpond restoration and revitalization program targeted at selected ponds and fishtraps on Moloka'i. Kahinapohaku and Honouliwai fishponds were selected by the Task Force to serve as a model for community and 'ohana-based

EXHIBIT 1
DESCRIPTION OF PARCELS¹

| <u>Fishpond Name</u> | <u>TMK #</u> | <u>Owner</u> | <u>Site #</u> |
|----------------------|--------------|--------------|---------------|
| -- | 5-7-01 | State | 226B |
| Kaloko`eli | 5-4-02:14 | State | 133 |
| -- | 5-7-08 | State | 193 |
| -- | 5-7-03 | State | 894 |
| -- | 5-6-09 | State | 156 |
| `Ohalahala | 5-8-01:3 | State | 231 |
| Halemahana | 5-6-03:35 | State | 184 |
| Wehelauulu | 5-6-06 | State | 170 |
| Mahilika | 5-7-10:31 | State | 189 |
| Panahaha | 5-7-07:22 | State | 202 |
| Kainalu | 5-7-04 | State | 220 |
| Pahiomu | 5-5-01:10 | State | 149 |

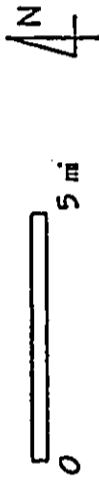
¹ponds are listed according to their ranking in a hierarchy which reflects suitability for restoration.



Community-based Hawaiian
Fishpond Restoration
and Use on Molokai

PONDS PROPOSED FOR GENERAL
CONSERVATION DISTRICT USE PERMIT

Note: See text for description of ponds. Number shown is taken from Molokai A Site Survey
by Catherine C. Summers, Derrice P. Bishop Museum, Honolulu, 1971



Scale

Location Map

IF FISHPONDS SUITABLE FOR RESTORATION

UH Study (1993) :

| # | Task | | Griffin | COE | Footprint | Wall condition | Rocks available | Walls | |
|------|----------|-----------------|---------|-----|-----------|----------------|-----------------|----------|----------------|
| | Acreeage | Force Community | | | | | | | Archaeological |
| 1 | 54.5 | * | • | II | 3 | partial | partial | moderate | none |
| 14 | 28.2 | * | • | I | 3 | complete | complete | adequate | minimal |
| 3 | 13.8 | * | • | II | 2.8 | n/a | n/a | moderate | n/a |
| 3 | 1.0? | * | • | II | 2.8 | n/a | n/a | n/a | n/a |
| 9 | 40.0 | * | • | II | 2.8 | partial | none | moderate | none |
| 3 | 1.5 | * | • | II | 2.7 | complete | partial | adequate | none |
| 35 | 3.3 | * | • | II | 2.7 | complete | partial | moderate | none |
| ? | 8.0 | * | • | II | 2.7 | partial | partial | moderate | none |
| 1-31 | 13.3 | * | • | II | 2.3 | partial | none | moderate | none |
| 22 | 13.8 | * | • | II | 2.2 | partial | partial | moderate | none |
| ? | 19.0 | * | • | II | 2.2 | partial | none | moderate | none |
| 10 | 20.0 | * | • | I | 2.2 | complete | complete | moderate | severe |

as a Candidate for restoration.

community members (12/93).

excellent example of a site type or construction

ion, vegetative encroachment, and wall condition,
E 1975);
II condition.

reconstruction and revitalization. Selection of these two fishponds was based on their ownership by the State of Hawaii, regulatory agency support, small size, absence of significant archaeological constraints, lack of siltation, minimal environmental impact, public access considerations, and the strong support demonstrated by the Moloka'i community, the Kahinapohaku and Honouliwai 'ohana, and the Cultural Committee of the Task Force. The present project follows up on these initial restoration efforts to address similar ponds on Moloka'i.

Project Description

The proposed action involves the repair and reconstruction of fishpond walls and makahas (sluice grates); periodic post-construction maintenance of the fishpond walls and basins; and operation of the fishponds using traditional, culturally-based, management practices.

Repair and reconstruction will entail the following actions: 1) the physical movement, alignment, and retrieval of wall foundation boulders from within the pond basin using a tracked backhoe or loader/dozer; 2) the manual movement, manipulation, and temporary stockpiling of smaller 'ili'ili (pebbles or rubble) within the fishpond basin; and 3) reconstruction of the pond wall using existing onsite rock, mechanized equipment, and 'ohana-provided manual labor. Construction will take place in the months between April and September when low to minus tides are common.

Periodic post-construction maintenance activities are required to facilitate the long-term use and management of the fishponds. These activities will include manual replacement of wall stones dislodged as a result of heavy surf action, and manual removal of wave-deposited sand and rock from the fishpond basin to maintain pond depths.

Fishpond use and management will involve the manipulation of environmental conditions within the pond, and use of submerged net-pens and cages, nets, spears, or other devices in accordance with existing State-regulated fishing methods, seasons, and catch limits. Marine organisms trapped, harvested, or cultured within the fishpond will be used for either local subsistence consumption by the 'ohana, as stocking materials for other Moloka'i fishponds, or both.

To the extent possible, fishpond use and management will follow traditional practices and methods, subject to existing State-regulated fishing methods, seasons, and catch limits. Marine organisms cultured or harvested within the pond will be used for either subsistence purposes or as stocking materials for other Moloka'i fishponds.

Pond Selection Criteria

The 12 fishponds proposed for reconstruction were selected from a candidate list of 69 ponds compiled and evaluated in a report to the Aquaculture Development Program (MBA International 1993: *A Study of Community-based Hawaiian Fishpond Restoration and Use on Moloka'i*. Final report submitted to the Aquaculture Development Program,

Department of Land and Natural Resources, State of Hawaii.). All twelve fishponds in this permit application are State-owned.

A wide spectrum of factors affect the "restorability" of ancient Hawaiian fishponds on Moloka'i. These range from obvious considerations of cost, to less-known concerns such as those relating to regulation of "navigational servitude" of fishponds. Many factors are interrelated, e.g., the fact that a fishpond is heavily silted (an environmental consideration) leads to a much higher cost (an economic factor) for restoration. Evaluation of fishponds on the basis of the most important criteria leads to a ranking of the relative ease with which they could be restored. Following are brief descriptions for each criterion.

Environmental Factors

Mangroves. While mangroves are non-native plants in Hawaii, their presence in coastal areas of the State constitutes a natural resource recognized and regulated by the Federal government. Because of this, the presence of mangroves overgrowing fishponds which have fallen into disuse presents an obstacle to fishpond restoration.

Endangered Species. As protected by the Endangered Species Act, presence of any endangered species on a potential site for fishpond restoration would hinder the restoration process. Possible endangered species most likely to be associated with fishpond sites on Moloka'i include the Hawaiian Stilt (*ae`o*; *Himantopus mexicanus*, the Hawaiian Coot (*alae ke`oke`o*; *Fulicia alai*), and the Hawaiian Gallinule (*alae`ula*; *Gallinula chloropus*).

Siltation. Moloka'i's coastal waters are subject to the heaviest siltation found anywhere in the State. As a result, many fishponds are silted over, often to depths of several feet. The presence of heavy silt poses significant problems for restoration: how is the silt to be removed, where should it be disposed of, what are the costs involved, etc.

Regulatory Factors

Navigational Servitude. As is the case with most fishponds on Moloka'i, the walls of the pond, having fallen into disuse, may be breached by the ocean. This may lead to the pond basin being used as a navigation channel for fishermen or other boaters. Navigation rights become an issue when the open waters of an abandoned fishpond are subsequently isolated by the building of restored walls, thus excluding that area from navigational use.

Water Quality. Not only is water quality of concern insofar as it impacts the potential operational success of a fishpond, effluent water generated by intensive aquaculture may impact water quality. The Department of Health is charged with regulating and enforcing such water quality standards throughout the State.

Archaeology. While one of the objectives of pond restoration is to preserve the cultural and archaeological significance of ancient Hawaiian fishponds, it is crucial that, in the process, such restoration does not damage or obliterate the very cultural resources which it sets out to save. Damage to or destruction of archaeological resources is minimized through close coordination with trained archaeologists and the State Historic Preservation Office in identifying unique resources at each site, and determining the restoration methods most appropriate for each pond.

Wetlands and Special Aquatic Sites. Wetlands are lands which are at least periodically saturated with water. As breeding, rearing, and feeding grounds for many species of fish and wildlife, wetlands are recognized by the Federal government as a unique and protected natural resource. In addition to wetlands, other habitats are recognized as special aquatic sites; they include, among other types of habitats or ecosystems, coral reefs, mangrove swamps, mudflats, and tidepools. The presence of any of these recognized wetland habitats on a fishpond site potentially presents regulatory obstacles to restoration.

Socioeconomic Factors

Construction/Material/Labor Costs. Virtually all of the preceding factors may potentially impact the costs of restoration of fishponds. In addition, variation will occur as to the availability of materials at or near the site, as well as the availability and costs of labor. Finally, cost of restoration is directly tied to the size of the site being restored. All other factors being equal, a pond having smaller basin area or walls of shorter length will be easier and less costly to restore than a larger pond with a more extensive basin and longer walls.

Need for Heavy Equipment. The use of heavy equipment may be controversial for certain projects, such as fishpond restoration, which seek to maintain traditional values. However, the Moloka'i community, while favoring traditional restoration methods as far as they can be used, has expressed a willingness to utilize heavy equipment for fishpond restoration as necessary. The community recognizes that in most cases, this is the only practicable means by which restoration will succeed. However, this criterion is still useful in assessing relative ease of restoration, since ponds requiring use of more equipment will, at the very least, be more costly than ponds not requiring as much use of heavy equipment.

Community Support. While the Moloka'i community generally favors restoration of all ponds, there is stronger support for the restoration of certain ponds over others. For example, strong support may be the result of a specific 'ohana wanting to restore its traditional fishpond for use in subsistence fishing. Lack of support, on the other hand, may be the result of the pond being privately owned or otherwise inaccessible to the public. The level of community support (if known) is an important factor which will help to determine which ponds stand the best chance of being restored.

Coastal Access. Some publicly-owned ponds do not have overland rights-of-way, although they may be approached from the sea or along the shoreline below the vegetation line. Usually, access rights can be obtained from abutting private owners either through easements, or, ultimately through condemnation if the need is sufficiently urgent.

Pond Productivity Potential. While the primary impetus for fishpond restoration on Moloka'i is the desire to see a resource of historical and traditional significance preserved, an important secondary impetus is the prospect of having a restored pond operate as a viable, producing aquaculture facility. Due to the varied coastal and water quality aquaculture conditions which prevail at different sites, certain ponds offer greater productivity potential than others.

Ranking Hierarchy for Moloka'i Fishponds

On the basis of information gathered from aerial photographs (ACOE 1975) and existing literature, MBA International evaluated and categorized 69 fishponds on Moloka'i. Previous authors have attempted to establish various classifications which present a picture of the relative physical condition, production potential, or historical value of Hawaii's fishponds (DHM 1989; Estioko-Griffin 1987; Madden and Paulsen 1977; Apple and Kikuchi 1975; Summers 1971; Summers 1964). Unfortunately, not all of the criteria which might impact fishpond restoration have been researched and described. In addition, those references which emphasize certain aspects of fishpond condition, such as their productivity potential (Madden and Paulsen 1977) or archaeological value (Apple and Kikuchi 1975) do not cover all sites. The criteria which are most consistently described in the literature and available for analysis relate to the physical condition of the ponds. For the most part, these include the degree of siltation, degree of vegetation encroachment, and condition of pond walls. These features are also discernible in aerial photographs (ACOE 1975).

In attempting to organize data in a form which would permit the orderly ranking of Moloka'i's fishponds with respect to ease of restoration and permit acquisition, a decision was made to rely most heavily on an analysis of the aerial photos. This enabled the determination of physical condition of ponds, with a minimum of subjective interpretation. Some corroboration of information gained from observation of aerial photos was also obtained from written descriptions. For each pond, siltation, vegetative cover, and wall condition were estimated and assigned a numeric value on a scale from 1 to 5, as follows:

Silt: 1 = Pond covered over in silt (or silt and vegetation) to 5 = Minimal silt in pond.

Vegetation: 1 = Pond covered by vegetation (or vegetation and silt) to 5 = Pond basin and walls relatively free of encroaching vegetation.

Wall Condition: 1 = Walls not visible or covered by silt or vegetation to 5 = Walls pronounced, nearly intact.

The three numbers were added and averaged to obtain a value reflective of the overall physical condition for the pond. Additionally, because ease of restoration is directly tied to pond acreage and pond wall length, these factors were also considered in the analysis. Criteria employed in the analysis were prioritized in the following order: numerical rating based on aerial photographs; pond wall length; and pond area.

The analysis of the ponds by aerial photo gave a strong indication of potentially restorable ponds. Because the accuracy of the analysis was limited by the fact that the aerial photographs on which data were based are outdated (taken in 1975), a site survey was performed by the University of Hawaii. Site visits by the University of Hawaii Department of Urban and Regional Planning helped confirm the results of the photo analysis. It also resulted in a further culling of the originally considered 69 ponds. The resulting list of 33 ponds (12 of which are a part of this application) reflects two different processes and two different perspectives. By relying on separate, independent, selection sources, the resulting list of ponds has been highly scrutinized and is very sensitive to environmental and cultural concerns. The twelve State-owned ponds represented in this application have met rigorous suitability requirements (see Exhibit III).

SECTION 2
DESCRIPTION OF THE AFFECTED ENVIRONMENT

PHYSICAL CHARACTERISTICS

Physical Environment

The underwater topography of the fishponds and adjacent nearshore areas consists of five major physiographic zones: 1) a sandy, but somewhat silty, intertidal and nearshore subtidal zone; 2) a pond basin characterized by boulder-to cobble-sized basalt rock; 3) a broad zone of *'ili`ili* (this may or may not be present, depending on the original construction of the wall); 4) the structural remains of the fishpond wall foundation; and 5) a wave-exposed seaward limestone reef flat platform.¹

Water Currents

The results of limited water current studies conducted during October and November 1992 indicate that prevailing currents flow lateral to the shoreline within the fishponds during normal tradewind conditions. Wave surge and tidal changes create localized zones of much greater velocities, but these zones are confined to the wall openings and channels along the perimeter of the walls where wave influence and tidal exchange are most pronounced. Casual observations made during extremely low tides, and during an absence of tradewind conditions, suggest that water currents are minimal to non-existent during such periods. However, tradewinds are the norm for most of Moloka`i, thus during most low or minus tide conditions, wind is expected to have some influence on pond water currents and turnover.

Biological Environment

Marine animals

The beach strand habitat has been extensively modified in many of the fishponds as a result of road construction and periodic cutting. Several species of coral have been recorded within fishpond basins or in association with the structural remains of the fishpond walls. Because of their small size and prostrate growth forms, reef platform corals generally do not provide any significant habitat for fishes or invertebrates.

¹Although sharing many physical similarities, differences exist between individual ponds. For example, ponds demonstrating single-wall construction, lack *'ili`ili* stone; certain ponds are characterized by several inches to many feet of unconsolidated overburden material (silt) atop the natural reef flat; and wave-exposure differs as a function of width of the seaward reef flat, proximity to major channels, and degree of wind exposure.

The macroalgal flora vary widely among the microhabitats of the fishponds. Brown algae may dominate the fishpond basin, whereas articulated and non-articulated coralline red algae tend to dominate seaward reef flat platforms.

Macroinvertebrate fauna in the fishpond basins generally demonstrate low diversity, composed mostly of common intertidal and subtidal mollusks, urchins, and crustaceans. Pond walls provide habitat for sea cucumbers.

Fishes are, with few exceptions, low in both diversity and abundance. Dominant species include manini, kupipi, weke, ama`ama, `opua, palani, and mamu.

Vegetation

Terrestrial Flora. Most of the coastal strand along the shoreline has been modified as a result of highway and storm drain construction and maintenance (brush cutting). The beach vegetation adjacent to the fishponds generally consists of native and introduced coastal strand species such as koa haole, naupaka, milo, hau, kiawe, and beach heliotrope.

Mangrove

The red mangrove (*Rhizophora mangle*) is a common floral constituent of many ponds. While mangroves are non-native plants in Hawaii, their presence in coastal areas of the State constitutes a natural resource recognized and regulated by the Federal government.

Birds

Birds associated with the coastal strand and beach slope include the common (Indian) mynah, zebra dove, spotted dove, northern cardinal, mannikins, and the Japanese white-eye. Various species of wading birds are likely to use the areas abutting the shoreline.

Mammals

The Indian mongoose, various rats and mice, and occasional feral goats and pigs, all introduced species, are common along the shoreline of Moloka`i.

Rare, Threatened, or Endangered Species

As protected by the Endangered Species Act, presence of any endangered species on a potential site for fishpond restoration would hinder the restoration process. Possible endangered species most likely to be associated with fishpond sites on Moloka`i include the Hawaiian Stilt (`ae`o; *Himantopus mexicanus*), the Hawaiian Coot (`alae ke`oke`o; *Fulicia alai*), and the Hawaiian Gallinule (`alae `ula; *Gallinula chloropus*).

The federally-listed endangered Humpback whale is seasonally found in waters off the coast of Moloka`i. This endangered marine mammal

performs breeding, calving, and nursing activities in Hawaiian waters between the months of November and April or May, particularly in the area bounded by Maui, Moloka`i, Lanai, and Kahoolawe.

The federally-listed endangered Green sea turtle is known to forage and rest in shallow waters around the Hawaiian Islands and may occur in the vicinity of the project sites. The threatened Hawksbill turtle may also occasionally occur in the vicinity of the Moloka`i coast.

Water Quality

The selected fishponds generally demonstrate physical and chemical characteristics more or less typical of nearshore coastal waters with slight groundwater or surface water inputs. Water quality studies of two ponds indicate that oceanic conditions of temperature, salinity, and dissolved oxygen prevail in the ponds. Overall water quality is generally high with no physical or chemical parameters likely to be limiting to marine organisms.

Moloka`i's coastal waters are subject to the heaviest siltation found anywhere in the State. As a result, many fishponds are silted over, often to depths of several feet. The presence of heavy silt poses significant problems for restoration: how is the silt to be removed, where should it be disposed of, what are the costs involved, etc. However, a low level of siltation was one of the criteria used in the selection of the ponds for restoration. Some of the fishponds are subject to siltation associated with discharges from coastal streams. These discharges may have a minor influence on coral growth and development.

Air Quality

Air quality in the vicinity of the project site is presumed to be high because of the low population density in the region. The major sources of air pollutants include light traffic on Highway 450, salt spray (originating from wave action), occasional outboard motor use, and periodic volcanic fog (vog) and smoke originating from a sustained volcanic eruption on the Island of Hawaii.

Noise

The project sites are situated away from noise-sensitive locations. Existing noise is generally the result of vehicular traffic on Highway 450, occasional outboard motorboat traffic, and wind and wave action.

Natural Hazards

The proposed project sites are located within the Flood Emergency Management Agency (FEMA) hazard zone and within the Civil Defense Tsunami Inundation Zone. Areas just mauka of the shoreline are subject to flash-flooding; the project sites and adjacent shoreline areas are subject to storm wave and tsunami inundation. However,

FEMA boundaries are of no relevance to the proposed action, because no temporary or permanent habitable facilities or structures are proposed.

SOCIAL AND ECONOMIC CHARACTERISTICS

As noted in Section 1, Hawaiian fishponds and fishtraps are a unique cultural resource and food production system developed and refined by pre-Western and post-Western contact Hawaiians. The cultural and natural resource value of these fishponds to the Hawaiian community and the fishpond `ohana has been progressively lost as a result of structural damage to the fishpond wall by recent and historic tsunami and storm waves, regulatory obstacles, and general neglect of this unique coastal and cultural resource. The proposed project will facilitate repair and reconstruction of these fishponds and support the revitalization of community and `ohana-based traditional operation and management skills once associated with Hawaiian fishponds.

Community Support

Strong community support for pond restoration may be the result of a specific `ohana wanting to restore its traditional fishpond for use in subsistence fishing. Lack of support, on the other hand, may be the result of the pond being privately owned or otherwise inaccessible to the public. The level of community support (where known) is an important factor in determining which ponds stand the best chance of being restored. When queried at a community meeting co-sponsored by the University of Hawaii about the twelve ponds in this application, Molokai community members in attendance were unanimous in their preference to have all of these ponds restored.

Historic/Cultural Importance

The Historic Preservation Division, State Department of Land and Natural Resources, is the primary agent for the determination of appropriate restoration plans for historical sites or resources. A representative of this office has participated with the Task Force and made site inspections of selected ponds. The description of the ponds was provided by the Division.

Proposed restoration plans for any fishpond must be approved by the Historic Preservation Division. Critical elements of proposed restoration plans include the following guidelines:

Restoration should retain the essential characteristics of the fishpond's physical structures, such as the alignment of the wall, the type of materials used, and the basic dimensions and cross-sectional profiles.

The process of restoration should not damage the targeted historical resource, or other historical resources on the site.

The operation of the ponds should not detract from their historical and cultural significance.

In many cases, precise wall dimensions such as width, height, and slope cannot be determined from the remains at the site. Typical sections from other walls, evidence available onsite, and the probable original operational methods of the ponds need to be considered in developing the proposed reconstruction plans. By interpreting and applying available archaeological information in this manner, a procedure for pond restoration is developed which achieves structural and operational soundness, while giving due consideration to the unique cultural and historical significance of the fishponds.

Recreation

Recreational practices associated with the fishponds and environs consist primarily of sight-seeing and water-dependent activities including boating, fishing (nets, spears, and rod and reel), and swimming. Because of limited roadside public vehicular parking areas at most of the fishpond locations, these activities are believed to be conducted mainly by residents of the areas.

Navigational Servitude

With most fishponds on Moloka'i, the walls of the ponds have fallen into disuse and may be breached by the ocean. This may lead to the pond basin being used as a navigation channel for fishermen or other boaters. Navigation rights become an issue when the open waters of an abandoned fishpond are subsequently isolated by the building of restored walls, thus excluding that area from its former navigational use.

SECTION 3
PROBABLE IMPACTS OF THE PROPOSED ACTION
AND MITIGATION MEASURES

PROBABLE IMPACTS AND MITIGATION MEASURES

Physical Environment

The proposed action will alter the physical topography of the existing fishpond substratum as a result of the collection and repositioning of wall stones. The existing substratum will change from one dominated by stones, cobbles, and *'ili`ili*, to one of mixed cobble and sand. Water depths within the fishponds will increase as a result of rock removal. Vertical relief associated with the existing pond walls will be increased along the length of the wall corridor as a result of the wall reconstruction. Water currents within the fishponds will decrease, although restoration of one or more makahas will ensure that adequate exchange is maintained with adjacent coastal waters. The ability to regulate tidal exchange and water currents is a desirable consequence of the proposed project since it will permit the biological productivity of the fishpond to increase in a manner consistent with Hawaiian aquacultural practices.

Biological Environment

The proposed action will result in no significant short- or long-term environmental impacts to the fishpond basins or adjacent marine communities. As a result of rock removal, stockpiling, and wall reconstruction, minor impacts would accrue to communities of epibenthic macroalgae which dominate most subtidal rocks in the fishpond basin. Heavy equipment operations, rock repositioning, and other manual activities will result in the temporary relocation of some fishes. However, these fishes presently move between the fishpond basins and adjacent coastal waters as a result of tidal fluctuations, thus such temporary dislocations are not expected to result in any adverse impacts to the affected species. Rock repositioning and wall construction may crush certain benthic invertebrates, however, these losses are expected to be minor.

Upon completion of wall reconstruction, the increased vertical relief, together with the use of large foundation boulders and smaller stones, will provide a number of new protected microhabitats and niches for many marine organisms. Such protected habitats are presently few in number because of the limited topographic relief available in most of the fishponds. Epibenthic algae and invertebrates are expected to recolonize the repositioned pond boulders and stones. The collection of existing rock and cobbles, now littering pond basins, will result in a deepening of the fishpond which is expected to increase biodiversity over baseline conditions.

Water Quality

Nearshore water quality impacts associated with the proposed action are expected to be short-term in nature and largely confined to the immediate vicinity of the project sites. Wall reconstruction activities such as rock collection, stockpiling, repositioning, and placement are expected to result in a short-term increase in the level of silt and suspended solids within fishpond basins and adjacent reef flat waters. Increases in suspended solids will result from dislodged algae (both macroalgae and microscopic algae), suspension of organic detritus, and agitation of the silt deposits. However, increases in turbidity levels and suspended solids during wall reconstruction are not expected to exceed levels which prevail during periods of heavy rainfall runoff.

The completion of wall restoration activities could result in a slight increase in ambient water temperatures within fishpond basins. However, any such increases would be small and likely to occur only during low or minus tide conditions when basin waters would be shallow and water circulation reduced. Low or minus tide conditions, coupled with an absence of tradewinds, could exacerbate these conditions, but potential impacts to organisms are judged to be minor, given the great range of physical and chemical environmental conditions within which such nearshore and intertidal organisms thrive.

Small quantities of hydrocarbons (oil, diesel fuel, or gasoline) may be inadvertently leaked into nearshore waters during heavy equipment operations. Any such leaks will be minor and subject to rapid dissipation through evaporative processes and dilution.

Dissolved inorganic nutrients and the levels of various organic materials may increase slightly with disturbance of rock and benthic deposits within the fishponds. Such impacts are judged to be minor, given the high degree of flushing that the fishponds will be subject to during all but the lowest tides. Increases in nutrient levels associated with low tide conditions may create conditions favoring rapid growth of microalgae, although the resident time of basin waters during low or minus tide periods may likely be too short to permit development of algal blooms.

Wall reconstruction activities will generally be confined to periods of low or minus spring tides when conditions are more favorable for both equipment operations and manual labor. Timing construction during low tide periods will ensure that project-related impacts are largely confined to the fishpond walls and basin areas.

After restoration, the fishponds will be maintained and operated in the traditional Hawaiian manner. Intensive aquaculture use is not anticipated.

Air Quality

The proposed restorations would cause minor and temporary air pollution as a result of engine emissions from heavy equipment operations, and vehicles used by the wall restoration crew. These impacts are short-term in nature and would be limited to no more than a 3 to 6 month construction period.

Flora and Fauna

Impacts to coastal strand plant communities will be minor and will result from heavy equipment ingress to and egress from the project sites. Noise and activity associated with heavy equipment operations and manual labor may temporarily dislocate wading birds and exotic birds which may frequent fishpond waters or adjacent strand and upland communities. Such temporary displacements are not regarded as significant.

Reconstructed fishpond walls will likely create permanent and somewhat protected resting or feeding habitat for indigenous wading birds. The deepening of fishpond basins is also likely to increase biodiversity, resulting in improvements of the pond as a feeding site for indigenous seabirds and wading birds. The diversity and density of certain wading birds and seabirds may increase with the operation of the fishponds because of the greater abundance of fish biomass and forage fishes within the fishponds.

Endangered and Threatened Species

The sites were selected to ensure that no federal or state-listed endangered or threatened plant or animal species or any designated critical habitat will be affected by the proposed project.²

Impacts to the Humpback whale are not expected since proposed wall reconstruction activities will take place between April and September when breeding and calving have been completed. No impacts on extant turtle populations is expected. Should turtles be observed within the vicinity of an active construction site, construction activities would cease.

Adjacent Land and Water Uses

The proposed restorations will change the land use at the project sites from infrequently used nearshore fishing grounds to that of managed, operating Hawaiian fishponds. Adjacent land uses will not be affected.

The proposed action will not significantly change or modify existing use of the shoreline or submerged lands adjacent to, or associated with, the fishponds. The proposed action will allow the resumption

² Kakaha 'ia Pond (Site No. 143), a wildlife reserve, is not included among the ponds selected for restoration.

of fishpond operation, management, and marine resource harvesting in a manner consistent with Hawaiian cultural and traditional values.

Noise

Project-generated noise is not expected to be significant. Noise will be generated as a result of internal combustion engine operation and associated hydraulic accessories. Noise generation will be limited to daylight periods, and normally for intervals not exceeding six hours in total duration (low tide periods). Noises will also be associated with the mechanical repositioning of both foundation stones and smaller wall stones.

Public Facilities and Services

The proposed actions will not directly or indirectly impact any public facilities, services, or utilities. The proposed project may result in an expenditure of public funds from Federal, State, or County funding agencies. However, no such funding sources have, to date, been identified.

Hazards

The proposed actions will not exacerbate coastal flooding or tsunami inundation patterns. The proposed wall reconstruction will generally provide increased storm wave protection to the shoreline and adjacent coastal highway.

Historic and Archaeological Resources

At the time restoration is to take place on a particular fishpond, a plan will be developed and submitted to the State Historic Preservation Division to ensure that there will be no adverse impacts to the archaeological or cultural integrity of the fishpond.

In general, the proposed actions will result in the community and 'ohana-based reconstruction and revitalization of ancient Hawaiian fishponds. The fishpond walls will be reconstructed and maintained in a manner consistent with traditional fishpond operational and management practices. The project will provide unquantifiable social and cultural benefits for Moloka'i's native Hawaiian community and fishpond 'ohana.

The proposed actions are consistent with the goals and objectives of the Task Force and its Cultural Committee.

Recreation

Fishing opportunities in the fishponds will be curtailed during reconstruction activities. As a result, fishermen who routinely practice throw-net, spear, or surf fishing in the vicinity of the project sites may have to find alternative fishing areas elsewhere.

The proposed project will modify existing shoreline and water-dependent recreational opportunities. This modification will result from a change in the physical character of the fishponds. The reconstructed walls will create a more protected nearshore coastal setting, which may increase swimming and snorkeling opportunities within the fishpond basins. The reconstructed walls may also provide an excellent platform for net and rod and reel fishing, both within and outside the walls. Some changes in marine resource harvesting practices and patterns may occur depending on the manner in which each fishpond is operated by its 'ohana.

Social and Economic Conditions

In their present deteriorated condition, most of the fishponds make no measurable contribution to the economic base of Moloka'i, other than occasional recreational and subsistence marine resource harvesting, and as a scenic amenity to residents and visitors to Moloka'i.

The reconstructed ponds are not expected to yield directly resources or revenues that will have a significant impact on Moloka'i's economic environment. Indirectly, however, benefits of the proposed revitalization will be manifested in the increased harvest of marine resources or the use of harvested marine resources as seed stock for other ponds.

Scenic and Visual Resources

The proposed project will provide a permanent, but not prominent, enhancement of the viewscape on Moloka'i. Reconstructed walls will be visible from sections of the coastal highway, from adjacent upland areas, and various scenic overlooks.

Permits

The proposed actions will require a General Permit from the U.S. Army Corps of Engineers, a Coastal Zone Management Consistency Determination from the Hawaii Coastal Zone Management Office, and a Section 401 Certification (or waiver thereof) from the Department of Health.

SECTION 4
ALTERNATIVES TO THE PROPOSED ACTION

SITE ALTERNATIVES

There are no suitable alternative sites that will accomplish the objectives of the proposed project or result in less disturbance to the natural environment. The selection of these fishponds was based upon the absence of major natural resource constraints (wetlands and endangered species) and significant archaeological sites. Broad-based community support and consensus for the reconstruction and revitalization of fishponds on Moloka'i has been shown by the Task Force and its Cultural Committee. In addition, support for the project was also voiced by Moloka'i residents who participated in a community-based questionnaire survey and public meetings.

NO ACTION ALTERNATIVE

The no-action alternative will result in the continued deterioration of the fishponds. Shoreline and water-dependent recreational activities will be further lost as storm wave action continues unabated and the fishpond walls further deteriorate. These impacts will contribute to a continuing loss of cultural and archaeological values, and a progressive loss of resources to future generations under the no-action alternative.

SECTION 5
LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED

CONSULTED PARTIES

The following agencies, organizations, and individuals were consulted during the preparation of this document:

William Paty, Chair, Board of Land and Natural Resources

John Corbin, Manager, Aquaculture Development Program

Donna Hanaiki, Deputy Director, Board of Land and Natural Resources

Roger Evans, Chief, Office of Conservation and Environmental Affairs

Steve Chang, Department of Health

Annie Griffin, State Historic Preservation Division

Billy Kalipi, Sr., Fishpond Restorer

Terrelle Kelley, Army Corps of Engineers

Stanley Halama, Member, `ohana of the Honouliwai ahupua`a

Dr. John T. Harrison, University of Hawai'i at Manoa, Environmental Center

Lance "Kip" Dunbar, Operator, `Ipuka`iole Fishpond

Michael Molina, US Fish and Wildlife Service

Members of the Governor's Task Force on Moloka`i Fishpond Restoration

Members of the Cultural Committee (under the Governor's Task Force on Moloka`i Fishpond Restoration)

Members of the University of Hawaii's Department of Urban and Regional Planning.

In addition to the above parties, our appreciation is also extended to certain interested members of the Moloka`i community: the 12 residents who participated in a 15 October 1992 Cultural Committee meeting; the 19 residents who participated in the 18 November 1992 community meeting on Moloka`i; and the 35 residents who participated in the December 2, 1993 community meeting on Moloka`i conducted by the University of Hawaii Department of Urban and Regional Planning.

The feedback received from each of the above listed individuals has helped to define the issues that have served to shape the content of this draft environmental assessment.

**SECTION 6
LIST OF PREPARERS**

The following firms and individuals were involved in the preparation of this environmental assessment:

MBA International
William A. Brewer
James T. Berdach

KRP Information Services
Jacqueline Parnell, AICP

Eugene P. Dashiell, AICP, Planning Services
Eugene P. Dashiell, AICP

Amaqna, Inc.
Craig Emberson, Principal

John H. Bay, Esq.
John H. Bay

Earthplan, Inc.
Berna Cabacungan

Department of Land and Natural Resources
Aquaculture Development Program
John Corbin
Joseph Farber

University of Hawaii
Department of Urban and Regional Planning

**SECTION 7
LIST OF REFERENCES**

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Summers, Catherine C. 1971. *Moloka'i. A Site Survey*. Pacific Anthropological Records No 14. Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawaii: 239 pp.

Wyban, Carol 1993. *Report of the Governor's Task Force on Molokai Fishpond Restoration*. Report prepared for the Department of Business and Economic Development and Tourism, State of Hawaii. May 1993.

APPENDIX A
DESCRIPTION OF PARCELS¹

| <u>Fishpond Name</u> | <u>TMK #</u> | <u>Owner</u> | <u>Site #</u> |
|----------------------|--------------|--------------|---------------|
| Kaumanamana | 5-1-02:4 | Private | 77 |
| Kaoaini | 5-4-03:23 | Private | 136A |
| Kanoa | 5-4-17:49 | Private | 137 |
| Ali`i | 5-4-06:25 | HHL | 135 |
| -- | 5-7-01 | State | 226B |
| Kaloko`iki | 5-6-08:20 | Private | 157 |
| Kaina`ohe | 5-6-05:22 | Private | 160 |
| Ka`ope`ahina | 5-7-09-01 | Private | 190 |
| Kaloko`eli | 5-4-02:14 | State | 133 |
| Keawanui | 5-6-06:8 | Private | 163 |
| -- | 5-7-08 | State | 193 |
| -- | 5-7-03 | State | 894 |
| -- | 5-6-01:1 | State | 185 |
| `Ualapu`e | 5-1-02:4 | Private | 79 |
| Naninani`eku`e | 5-1-02:4 | Private | 80 |
| -- | 5-1-02:4 | Private | 192 |
| Ni`auhala | 5-7-07:8 | Private | 156 |
| -- | 5-6-09 | State | 231 |
| `Ohalahala | 5-8-01:3 | State | 184 |
| Halemahana | 5-6-03:35 | State | 214 |
| Kula`alamihi | 5-7-04:34 | Private | 170 |
| Wehelauulu | 5-6-06 | State | 165 |
| Kaunahiko`oku | 5-6-04:28 | Private | 148 |
| Kanukuawa | 5-5-01:12 | Private | 146 |
| Kawi`u | 5-5-01:39 | Private | 206 |
| Kupeke | 5-7-06:1 | Private | 213 |
| Waihilahila | 5-7-06:27 | Private | 212 |
| Kihaloko | 5-7-06:22 | Private | 189 |
| Mahilika | 5-7-10:31 | State | 219 |
| `Ipuka`iole | 5-7-04:5 | Private | 202 |
| Panahaha | 5-7-07:22 | State | 220 |
| Kainalu | 5-7-04 | State | 149 |
| Pahiomu | 5-5-01:10 | State | 97 |
| Pakanaka | 5-1-02:4 | Private | |

¹Ponds are listed according to their ranking in a hierarchy which reflects suitability for restoration.

Appendix B

Comments and Responses on the
Draft Environmental Assessment

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Office of Conservation and Environmental Affairs

AUG 26 1994

File No.: MO-2733

August 26, 1994

MEMORANDUM

TO: John Corbin, Manager
Aquaculture Development Program

FROM: Don Horiuchi, Staff Planner *Don Horiuchi*

SUBJECT: Restoration and Operation of 12 State-Owned Fishponds

We have received the following comment on the proposed restorations from our Divisions:

Division of Aquatic Resources

The proposed restoration of the 12 State owned fishponds listed in the above application will conflict with several long standing fishing activities currently practiced by local fishers. With the possible exception of Pahiomu, the walls of these fishponds have deteriorated to the point where they can be discerned only during extreme low tides, if at all. Decades of neglect have resulted in the walls, particularly the outer walls, being totally demolished by wave action and inclement weather. Consequently, the ponds have reverted back to a more natural state of open navigable waters, and over the years local fishers have gradually regained access to these once enclosed reef flats. It is not uncommon today to see local people picking *limu*, throwing nets, and catching crabs in the near shore boundaries of these old fishponds. Further offshore, divers can often be seen fishing for *manini*, *pualu*, *palani*, and *he'e*, while others can be seen net fishing for *kala* and *weke*. Fishermen in flat bottom boats can also be seen trolling unimpeded for *papio* and *kaku* in these now defunct fishponds. Moreover, several of these ponds, particularly unnamed sites 156 and #193, extend so far out and are so badly deteriorated that it is not possible for anyone to readily realize that he is fishing within a fishpond. Anyone in these two sites would understandably think they are fishing in open public waters, when in fact they are within the confines of old fishponds. In addition, because of the lack of formal boat ramps on the island, many local fishermen have become accustomed to launching their boats through disintegrated State owned fishponds, particularly Wahelauula and Panahaha, to gain access to the open seas. Therefore, it is correct to assume that the restoration of these 12 State owned fishponds will have

We concur with the program goals outlined in Section II of the environmental assessment (Regulatory Factors: Archaeology) and page 14 of the Draft Environmental Assessment (Historic and Archaeological Resources). In order for these goals to have "no adverse affect" on historic sites, however, we recommend the following conditions be attached to the [permit approval]:

Prior to any undertaking at the fishponds listed,

(1) The original fishpond architecture needs to be documented archaeologically by a qualified archaeologist. Such documentation includes maps, photographs, and information on the name and legal location (tax map key) of the fishpond.

(2) Archaeological coring and analysis of sediments in the fishponds should be performed (to date the age and use of the pond). In addition, sediment cores from selected ponds should be analyzed for paleoenvironmental information. The archaeological firm doing this work must be experienced in carrying out such studies. The report documenting this work must be submitted to and accepted by the State Historic Preservation Division (SHPD).

(3) Documentation of the proposed restoration, repair, or reconstruction plans needs to be submitted to the State Historic Preservation Division. Such documentation can consist of sketches or descriptions of the methods, appearance, and materials to be used in the fishpond's restoration. Reconstruction of the fishpond walls should be in the same style as the original pond architecture (if it still remains), and the existing footprint or base of the fishpond wall should be followed.

(4) If any shore side activities will occur during restoration (e.g., transport or construction of construction materials) documentation must be submitted showing that no historic sites will be subjected to adverse effects.

(5) The source of the construction materials must be shown not to be from historic sites, and the landfill where any construction materials are disposed of must be shown not to contain historic sites.

(6) The individuals or groups conducting the restoration work shall maintain close coordination with the State Historic Preservation Division (SHPD) before, during, and after reconstruction.


The SHPD staff are currently attempting to secure funding to be used in recommended conditions (1) and (2); it is anticipated that the recommended work will be carried out under a contract administered by the SHPD.

Please address these comments in your final environmental assessment for the project. If you have any questions on this matter, please call me at 587-0381.

Aquaculture Development Program
December 5, 1994

MEMORANDUM

TO: Don Horiuchi
OCEA

FROM: John Corbin 

SUBJECT: Respond to Department Comments on the EA/CDUA for the Restoration and Operation of Thirteen State-Owned Fishponds

Thank you for the comments on the subject EA/CDUA from the Divisions of Aquatic Resources and Historic Preservation. We offer the following responses to these comments:

Division of Aquatic Resources

In November of 1993, a site survey of Molokai fishponds was conducted by the University of Hawaii. In regards to the condition of the subject pond walls, the survey team assessed the following:

Excellent (wall complete)

| | | |
|------------|-----|-----|
| Kaloko'eli | 133 | |
| Pahiomu | | 149 |

Good (wall 50% or greater intact)

| | | |
|--------------------|------|-----|
| Nameless @ Waialua | 226b | |
| 'Ohalahala | 231 | |
| Panahaha | | 202 |

Poor (foundation "footprint" partially or all present)

| | | |
|---------------------|---------------|-----|
| Nameless @ Wawaia | 156 | |
| Halemahana | 184 | |
| Wehelauulu | 170 | |
| Mahilika | | 189 |
| Kainalu | | 220 |
| Nameless @ Kaleiupu | 193 * | |
| Nameless @ Wailua | adj. to 228 * | |

* Not visited by UH, but categorized by other reports.

Thus, given the above information, five of the twelve ponds could be considered reasonably well intact and enclosed, easily recognized as fishponds, and unlikely to be considered open navigable waters. The remainder of the ponds have partial or complete "footprints" or foundations present, which would strongly indicate a former fishpond.

The intent and purpose of the restoration of these fishponds is for traditional and subsistence use by local Ohana groups. It is a grass roots effort, which envisions the restoration process to include the concept of *po'alima*, the participation of the community in the rebuilding and maintenance of the fishponds. These Ohana groups are foreseen to live within the vicinity

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of "their" fishpond and/or have familiar, historical ties to that site. We believe many of the people of Moloka'i who currently fish and gather in these respective waters would very likely be part of the respective Ohana groups.

Nonetheless, this restoration approach relies on consensus building within the community to assure that ponds targeted for restoration will be those which maximize development objectives and minimize negative impacts. Issues which may affect current uses within and adjacent to subject fishponds, such as public access, boat launching and current fishing practices, will be better addressed by other permit processes, e.g., Corps of Engineers, CZM Consistency and DOH 401 Water Quality Certification, or at the site disposition stage. At this time, detailed restoration and management plans will be available and a community group identified.

Working fishponds increase the fishing opportunities around the pond walls by increasing habitat just offshore by increasing productivity. The outflow of enriched waters from the ponds generally enhances the natural productivity of an area providing more food to the wild ocean stocks. In addition, if used in conjunction with stock enhancement/stock nursery programs, fishponds can directly increase the wild stocks.

Five of the twelve proposed ponds will require minimal wall repair. It is anticipated that all materials to complete these walls will come from on-site. Large stones and smaller infill stones *illi illi* and cobbles, will be used. On-site materials (original stones) will be collected within the pond basin, areas immediately adjacent to the original pond wall, and from the inter-tidal area. Materials will be collected manually and stockpiled in the pond. Cleaning of materials will occur in the pond at low or minus tides, utilizing silt curtains.

The reconstruction material for the walls of the remaining eight ponds will be a combination of both on-site and off-site materials. Materials collected off-site will only come from areas such as stream beds and quarries or other areas with relatively clean stones. The clean stones will be stockpiled inland of the sites, cleaned of debris, and then transported to the pond's wall.

Movement of the stockpiled inland stone to the pond wall will be performed either manually or with machinery. Regardless of the method used, movement of the stone will occur only at low or minus tides and when wind and wave action are minimal.

Attention to environmental conditions such as tides, waves and wind will be necessary if machinery is used. If used, it will only be employed to transfer stone from the shore to appropriate areas on the pond wall. Machinery will always be used in conjunction with silt curtains and only during low or minus tide. The machines will only travel over the existing pond footprint in areas properly protected by silt curtains. Following stone delivery, machinery will return to the land travelling along the pond footprint. Machinery will not travel across pond basins. Machinery will only be used to transport stone, reconstruction of the walls will be performed manually.

By confining use of machinery to times of low to minus tides, risk of petroleum products mixing with the ocean water will be minimized. At low and minus tides walls are exposed in many ponds. Operating machinery atop of the walls during these times will allow machinery to remain mostly above water.

Wall reconstruction will be performed manually and in concert with silt curtains. Silt curtains will be placed down-current of reconstruction activities. The curtains will be placed in a manner such that any turbidity created by reconstruction will be trapped and confined. Special

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care will be taken to ensure that silt curtains are properly placed during all phases of construction.

A water quality monitoring program will be incorporated into the restoration and management plan for each pond. Prior to reconstruction a baseline marine environmental survey of subject waters will be conducted. During reconstruction, daily monitoring will take place through visual observations and the use of a secchi disk to monitor turbidity.

The monitoring program will dictate the reconstruction schedule. If high turbidity levels are detected reconstruction activities will be halted. Reconstruction activities will resume once turbidity levels decrease.

In those sites where pond sediment is at or has been restored by natural processes to an acceptable level, periodic maintenance strategies will be implemented. These traditional strategies include periodic manual scooping out of accumulated silt. In addition, the culture of native mullet species could help keep the pond bottom clear and clean as this bottom feeder continually sifts through and filters the silt. The traditional approach proposed does not allow use of conventional dredging equipment.

Historic Preservation Division

We concur with the conditions proposed by the State Historic Preservation Division (SHPD). These conditions are to be included in the restoration and operation plans for each fishpond. This will ensure that actions taken to restore the ponds will have "no adverse affect" upon historic sites. The general conditions proposed are:

- 1) Documentation by a qualified archaeologist of the original fishpond architecture.
- 2) Archaeological coring and analysis of sediment in the fishpond will be performed by an experienced firm to date the age and use of the pond and a report must be submitted to SHPD for approval.
- 3) The restoration and operation plan will be submitted to the SHPD for review and approval.
- 4) The reconstruction of the pond wall should be in the same style as the original, and the existing footprint of the fishpond should be followed.
- 5) Documentation will be provided during shore-side activities to show that no historic sites will be subjected to adverse effects.
- 6) Documentation will be provided that the source and materials used for construction do not originate from historic sites; landfills where construction materials are disposed will contain no historic sites.
- 7) Those engaged in the restoration work shall maintain close coordination with SHPD before, during, and after reconstruction.

If you have any questions on this matter, please call me at 587-0030.



University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

August 22, 1994
EA:0080

Mr. Don Horiuchi
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813
and
Mr. John Corbin
Department of Land and Natural Resources
Aquaculture Development Program
335 Merchant Street, Room 348
Honolulu, Hawaii 96813

Dear Mr. Horiuchi and Mr. Corbin:

Draft Environmental Assessment (EA) and
Conservation District Use Application (CDUA)
Molokai Fishponds
(Repair, Reconstruction, Maintenance, and Use)
Molokai

The referenced document requests the restoration, maintenance, and use of 12 state-owned fishponds on Molokai for the purpose of facilitating traditional, 'ohana-based management.

We have reviewed this document with the assistance of Jon Matsuoka, Social Sciences; James Parrish, Hawaii Cooperative Fishery Research Unit; and Malia Akutagawa of the Environmental Center.

Our reviewers affirm this project in principle but harbor reservations as to the manner in which this document was prepared. While we agree that the ancient Hawaiian fishponds of Molokai ought to be preserved as a cultural and natural resource and that their restoration and operation should be a community endeavor, we feel that the Draft EA and CDUA is too vague and fails to meet criteria set forth in Section 11-200-10 of the Hawaii Administrative Rules (HAR). Under these rules, the preparer must provide a "general description of the action's technical, economic, social, and environmental characteristics" [11-200-10(4)]; identify and summarize "major impacts and alternatives considered" [11-200-

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and
Mr. John Corbin
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10(6)); and propose "mitigation measures" [11-200-10(7)]. Although these criteria were met to an extent, the document is too brief and lacks specificity necessary for a proper appraisal of potential project impacts on the environment.

Environmental Characteristics

Site Selection Criteria

It was noted that water quality measurements were taken from only two ponds; from these data, a correlation was made to the remaining ponds (p. 8). Aerial photographs were used as the primary source in choosing candidates for restoration (p. 5). Subsequently, a ranking system was created to determine which fishponds had the greatest potential for restoration. Factors such as degree of siltation, vegetative cover, and wall condition were assessed (p. 5). In addition, a survey done by the University of Hawaii was cited, but no reference was made to procedures employed and types of data collected (p. 6). We contacted one of the student researchers on the survey team; she reported that the scope of the project was confined to visual observations, and no water quality data were taken. The information generated from these study methods alone is an inadequate basis for making pond selection determinations.

Additional factors that may be helpful in site selection determinations would be water quality data measuring temperature, levels of dissolved oxygen to gauge the degree of water circulation, the presence of possible toxins particularly related to agricultural practices, nutrient concentrations which may be associated with exposure to sewage effluents from nearby housing development areas, and salinity to ascertain whether natural springs around which fishponds were commonly structured have dried up or been rerouted due to modern water use practices. Water depth at various locations in the pond during different tidal exchanges should be quantified. A determination should be made of whether there is a sufficient shoreline area for fish in the post-larval stage to conceal themselves from larger predators. These variables are critical to the viability of pond flora and fauna.

A practical consideration regarding pond selection is their location. Even if the ponds are State-owned, there may be problems of access where multiple landowners have built their homes around them. This type of scenario could also cause conflicts related to mangrove control. Where fishpond water once stood, land has accreted under mangroves; landowners may oppose the cutting of these plants by arguing that this land is now theirs.

Lack Of Specificity Regarding Each Pond Selected

The Draft EA makes generalizations about the ponds. The CDUA contains brief descriptions of the 12 fishponds to be selected for restoration. These data are insufficient

Mr. Don Horiuchi
and
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to make a determination of whether construction activities will adversely affect the surrounding coastal and marine environment.

Where a very thorough assessment of restoration plans for each pond has the potential of being unwieldy, a construction strategy that takes into account all environmental factors that may be present in some sites and not in others would provide a greater understanding of what sort of impacts are likely to occur given the condition of a particular pond. A table depicting the types of environmental conditions (e.g. pond wall deterioration, heavy siltation, etc.) common and unique to each pond selected would be helpful in determining what kind of construction practices will take place during restoration efforts.

Environmental Impacts

Endangered Species

It was noted that restoration activities may be hindered due to the presence of endangered species such as the Hawaiian Stilt (*Himantopus mexicanus*), the Hawaiian Coot (*Fulicia alai*), and the Hawaiian Gallinule (*Gallinula chloropus*) (p. 8). These endangered species may actually depend on or have adapted to these fishpond microhabitats, and pond restoration may replenish their numbers. On the other hand, if pond reconstruction practices prove detrimental to these species, proper mitigation measures must be implemented. The Draft EA fails to mention any mitigation efforts.

Birds

The Draft EA states that:

Reconstructed fishpond walls will likely create permanent and somewhat protected resting or feeding habitat for indigenous wading birds. The deepening of fishpond basins is also likely to increase biodiversity, resulting in improvements of the pond as a feeding site for indigenous seabirds and wading birds. (p. 12)

This statement is not altogether true, as wading birds will traverse only so far as they can touch bottom. Increased depths will likely benefit seabirds which do not have the same restrictions as wading birds.

Mangroves

Mangroves are federally regulated (p. 3). Is there a way to be exempted from these federal protections since mangroves were introduced to Hawaii and have proven detrimental

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to the fishpond ecosystem? Mangroves cause pond wall destruction, restrict sunlight penetration, trap sediments, reduce water depth, and accumulate nutrients needed for growth of phytoplankton. It is important to prevent siltation, since shallow ponds increase water temperatures thereby reducing dissolved oxygen levels to a potentially stressful level. Fine silts collected by mangroves increase turbidity which in turn hinders light availability for benthic algae which fish (i.e., mullet) consume. What has been proposed to deal with the problems associated with mangrove growth?

If the removal of mangroves from Hawaiian fishponds is permissible, are there ways of clearing and controlling their growth that will not adversely impact pond life? One suggestion would be to have workers cut mangrove stalks down to the water level, allow time for the plants to rot, and then pull them out. This would be preferable to the use of heavy equipment which would likely adversely impact existing benthic and sessile organisms and inhibit light penetration needed for phytoplankton and seaweed.

Siltation

The Draft EA acknowledges that Molokai's fishponds are prone to heavy siltation (p. 9), but there has been no proposal to address this problem in an environmentally sensitive way. Are traditional methods of siltation management applicable?

One traditional method of controlling siltation was to make furrows along the makaha during extreme high tide periods and let the receding tide extract this excess silt. An argument against this practice would be that it would increase sedimentation into open coastal waters. Arguments in favor of this method would be that it was traditionally done and that it contributes nutrients to these waters.

Another traditional method required community involvement once a week in the maintenance of the pond. Members of an ahupua'a would use bamboo rakes, gourds, and cups made up of coconut to scoop out the mud. This mud would be spread out evenly on the land where it hardened and released nutrients into the soil. A modern adaptation of this procedure could be explored.

Socio-Economic Factors

Section 11-200-12(b)(4), HAR, calls for an assessment of project impacts on the "economic or social welfare of the community or State." This Draft EA raises some socio-economic issues but fails to fully address them.

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Community Support

It was cited that there is strong community support for the restoration of Molokai's fishponds (p. 9). Were there any surveys done to quantify the degree of support or opposition to this project? What methods were employed to justify this contention? What are some of the reasons people support or oppose fishpond restoration and harvest?

The study done by the Molokai Fishpond Recovery Task Force should have been cited. In addition, figures from the Molokai Subsistence Study could have been used to gauge the degree of support or opposition to the restoration project.

Ohana-based Traditional Operation and Economic Benefits

It was stated that this project will serve to revitalize the community and allow for 'ohana-based traditional operation (p. 9). Nowhere in the document does it define what 'ohana-based traditional operation is. Will families interested in pond restoration and management do the work themselves and harvest the resources for their sole benefit, for the people in their ahupua'a, or for the entire island?

Will families sell the fish and other pond resources or will they be utilized only for subsistence purposes? Will the Molokai community derive any kind of economic benefit through commercial aquaculture activities or is this strictly an issue of cultural preservation? Are there certain parameters to how the ponds will be restored, managed, and used? The state's motivations are unclear.

It was mentioned that "an important secondary impetus is the prospect of having a restored pond operate as a viable, producing aquaculture facility" (p. 5). How secondary is this goal? Does the State perceive aquaculture as a way of decreasing fishing pressure on wild populations of fish, shellfish, and seaweed and/or as a way to stock and replenish their supply? Is the state worried about whether this project will be cost-effective? What if pond harvestability results in no net gain, but worse, a net loss? Will the state be satisfied with the fact that a cultural and traditional resource has been preserved, that subsistence needs conducive to traditional Hawaiian standards have been fulfilled but not an economic exploitation common to a Western market ideology? In examining the history of the Molokai community's treatment of prospective urban and resort development on the island, it appears that they are more concerned with activities that are culturally sensitive and environmentally friendly than with promoting huge economic returns. Does the State share a similar view?

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Functional Purpose of Each Pond

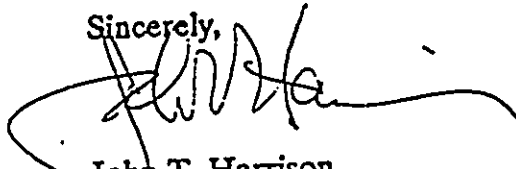
While the overall objective of this project is to revitalize the Molokai community and preserve a cultural and traditional resource, not much has been said about the role each individual pond will have. Will ponds serve hatchery or stocking purposes for other ponds? Will others be left to the raising of juvenile and adult fish? What kind of species will be raised in these ponds? Will the pond system be characterized as a polyculture with emphasis on preserving cultural practices and encouraging biodiversity and high fitness? Or will a monoculture type system dominate, where a highly marketable species is cultivated at the expense of reducing the gene pool of wild populations? Will this project advocate the cultivation of native marine species or explore the possibility of raising introduced species (e.g., Golden tilapia)? Will the discretion be left largely to family operators? What are the environmental, social, and economic implications of each alternative?

Summary

We applaud the efforts of the State and the Molokai community in wanting to preserve the fishponds as cultural and natural resources. While other islands have opted to use fishponds as marinas or allowed infilling to serve as a land base for housing projects, it is apparent that the Molokai community is mindful of the fishponds' significance as a manifestation of Hawaiian values of aloha 'aina and an attempt to promote components of a sustainable economy within the framework of a rural, subsistence lifestyle. However, on account of the technical deficiencies enumerated above, our reviewers strongly feel that the Draft EA is insufficient and unacceptable without revision.

Thank you for this opportunity to review this Draft EA.

Sincerely,



John T. Harrison
Environmental Coordinator

cc: OEQC
Roger Fujioka
James Parrish
Jon Matsuoka
Malia Akutagawa

JOHN WAIHEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
AQUACULTURE DEVELOPMENT PROGRAM
335 MERCHANT STREET, ROOM 348
HONOLULU, HAWAII 96813
(808) 587-0030 Telephone
(808) 587-0033 Fax

KEITH W. AHUE, CHAIRPERSON
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December 5, 1994

Dr. John Harrison
University of Hawai'i at Manoa
Environmental Center
2550 Campus Road, Crawford 317
Honolulu HI 96822

RE: Draft Environmental Assessment (EA) and Master
Conservation District Use Application (CDUA), Moloka'i
Fishponds (Repair Reconstruction, Maintenance, and Use)
Moloka'i.

Dear Dr. Harrison:

Thank you for the comments on the subject EA/CDUA. We
offer the following responses, in order, to these comments:

The purpose of the Master Conservation District Use
Application (MCDUA) is to streamline the overall permit
process for coastal Hawaiian fishponds and allow
historically accurate restoration by community groups,
Ohana, of selected ponds for traditional use. Underpinning
this generic approach was a selection process that
identified ponds on Molokai with broadly similar
environmental characteristics. Further, low impact, but
effective restoration techniques were formulated that could
be adapted to individual pond conditions.

It is the nature of this generic multi-site approach to
generalize and summarize various required descriptions.
Moreover, some issues raised by your reviewers will be more
appropriately addressed during other phases of the permit
approval / site leasing process, e.g., when specific
reconstruction and management plans for specific sites would
be available. We note that the proposed actions will
require a permit from the U.S. Army Corps of Engineers, a
Coastal Zone Management Consistency Determination from the
Hawaii Coastal Zone Management Office, and a Section 401
Certification from the Department of Health.

Site Selection Criteria

Concerns are raised that the information-base used was inadequate for selecting ponds.

As mentioned, water quality measurements were not part of the UH study. The UH study used visual observations to provide valuable ground truth information on wall and footprint condition, availability of stones, amounts of siltation, amount of mangrove, and access.

We envision as part of the preparation of individual site restoration and management plans, that baseline water quality data will be gathered. These data may include; water temperature, salinity, and dissolved oxygen concentration, as well as, more indepth studies, if needed. Pond topography will be part of the baseline data gathered.

We believe that reconstruction of these fishponds will increase the habitat and "refuge" sites available to young animals.

Access is another concern that will be taken up at other stages of the permitting / site leasing process. Preliminary indications are that all twelve ponds are accessible from the land side. It is not clear at this time how many ponds have public access or will require negotiated access prior to site disposition. Also, we believe due to the paucity of mangroves in most of these ponds that accreted land considerations are minor.

Lack of Specificity Regarding Each Pond Selected

We acknowledge that information provided is limited for rendering judgements on specific affects of restoration on the coastal and marine environments. This is the nature of a master permit process for multiple sites selected by general criteria. Again, when specific restoration and management plans are available these concerns can be addressed.

A summary table has been included in the EA depicting the following environmental evaluations: footprint and wall conditions, availability of stones, siltation, mangroves, and access.

Endangered Species / Birds

Impacts on endangered species are a significant concern. As stated in the EA, sites where selected to ensure that no federal or state-listed endangered or

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threatened plants or animal species or any designated critical habitat will be affected by the proposed restorations. Moreover, we concur that restoration of the fishpond is highly likely to enhance numbers of sea birds and wading birds. Again, specific site attributes or detriments can be addressed at the stage of preparation of individual pond restoration and management plans.

Mangroves

We concur that presence of mangroves are problematic when it comes to restoration and management of Hawaiian fishponds. In the case of the twelve MCDUA ponds, most have minimal or no mangrove encroachment to manage. We believe that severe mangrove infestations in two of the twelve ponds and future mangrove growth are manageable issues. Your suggestion of cutting mangroves down to water level and allowing time for the plant to rot, before pulling it out, is excellent and will be incorporated into restoration plans.

Siltation

Silt management in restoration and operation of fishponds is a major issue. Low key, traditional restoration precludes the use of conventional mechanical dredges. However, traditional methods, such as use of the *makaha* and manual removal of silt by community members, are entirely consistent with traditional use. Your suggestions will be considered for incorporation into management plans.

Fortunately, siltation problems are only present in half the ponds under consideration.

Socio-Economic Factors

Again, we believe that many of the concerns raised by this section will be addressed in more detail during the next stages of permit acquisition and site leasing for individual ponds. At that time restoration and management plans for individual ponds will be available and specific community groups who will be responsible for the restoration, will have been identified. However, we can address several of the questions raised.

Community Support

Community attitudes towards fishponds were assessed in a number of ways. A questionnaire survey of an interested segment of the Moloka'i Community was conducted in conjunction with a study by MBA International entitled, A Study of Community-based Hawaiian Fishpond Restoration and Use on Molokai. This survey of various fishpond restoration

issues was supplemented by an open community meeting on Molokai. Further, consultants had access to the minutes of the Governor's Task Force on Molokai Fishpond Restoration, which often met on Molokai and included members of the Molokai Community. Meetings were attended by the general public.

The MBA International Study and the report of the Governor's Task Force On Molokai Fishpond Restoration were added to the list of references for the EA.

Major conclusions from the Molokai survey are summarized in the following paragraph from the study:

"The essential issue was traditional versus contemporary restoration and use and it was envisioned that major disagreement would center on the preferred mode of fishpond restoration. However, questionnaire results and community workshop input suggested that a large sector of the Molokai Community was in consensus on this and other key issues. While most respondents agreed that traditional use and methods of restoration would be respected, they also felt that fishponds be restored in as efficient a manner as possible, i.e., that the use of certain types of modern heavy equipment for wall reconstruction was acceptable. There was also consensus on the aquaculture technology involved, with the majority of respondents believing that both traditional and contemporary aquaculture technologies should be used. The respondents were also in favor of the proposed development of a Molokai Fishpond Commission to regulate and control uses of fishponds. The proposed Commission would be responsible for processing applications for future fishpond restoration projects, and for reinforcing established rules and regulations."

Ohana-based Traditional Operation and Economic Benefits

The issues raised in this section will largely be addressed during the site leasing stage, when individual community or Ohana groups have been identified. Leasing a site will require preparation of detailed restoration and management plans for the respective pond. It is envisioned that a lease will have terms that address these issues, as they apply in each situation. It should be clear that this MCDUA applies to non-commercial, traditional use. No construction will begin without review and approval of restoration and management plans by all agencies with jurisdiction.

Revitalization of Molokai fishponds should result in multiple benefits to the community, as well as the environment, particularly cultural preservation, subsistence

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lifestyle opportunities, appropriate economic opportunities and opportunities for replenishing wild fish stocks. The feedback from the Molokai community indicates that economic development should not and need not sacrifice the Hawaiian culture or the Molokai lifestyle. Hawaiian fishpond revitalization is one widely supported approach to addressing this need.

Finally, we envision these restoration projects going forward supported by a combination of "sweat equity" by Ohana groups, and Federal, State, County, and private direct and in-kind financial support.

Functional Purpose of Each Pond

We reiterate, that issues of management of individual ponds will be addressed during the site leasing process. Required management plans will describe specific culture practices, which no doubt will include a variety of native species (only native species will be permitted) and some low technology approaches to improving fishpond productivity. Enhancement of wildstocks using Hawaiian fishponds is one possible use that is under discussion, and in concept seems very appropriate.

Thank you for your comments. We hope our response satisfactorily addresses the issues you have raised.

Sincerely,



John S. Corbin

Manager

cc: Don Horiuchi, OCEA