



CHAPTER 3  
PLANNING FRAMEWORK





## **CHAPTER 3 PLANNING FRAMEWORK**

Wetland restoration conceptual improvements were developed based upon a planning framework established for this 80-acre project. The intent of the framework is to ensure DOFAW's requirements for the USFW grant are addressed, and are consistent with their mission and objectives for the larger Kawainui Marsh area. Guiding principles were developed based on best use practices for the site, the specific elements of the grant application, existing references and studies published for Kawainui Marsh, consultations with government agencies and the community, and evaluation of existing site conditions. A summary of these factors contributing to the planning framework is provided below.

### **3.1 Project Need and Objectives**

DOFAW's mission is to enhance, protect, conserve and manage Hawaii's unique and limited natural, cultural and historic resources held in public trust for current and future generations. This includes the people of Hawai'i and visitors acting in partnership with others from the public and private sectors. In fulfilling this mission, DOFAW obtained a grant to implement improvements to a portion of Kawainui Marsh. Therefore, the goal for this project supported by grant funds is to restore habitat for native Hawaiian water birds, migratory shorebirds and waterfowl, and native fish species within the study area at

Kawainui Marsh. DOFAW's three primary management objectives for this area include: 1) controlling invasive vegetation; 2) controlling water flow into the marsh; and 3) managing public access.

Objectives also involve local organizations, businesses, schools and City, State and Federal agencies in the process in order to integrate the wildlife sanctuary into the community. By including a broad spectrum of community organizations, businesses, schools and government agencies, the project is intended to instill a sense of ownership by local citizens, educate residents and visitors, and encourage further habitat restoration at this internationally recognized marsh.

Today, over 30 percent of Hawaii's natural lowland wetlands have been filled or converted to other land uses such as agriculture and urban expansion. Oahu's windward coast wetlands are mostly small and isolated by topography and urban expansion. Long-term protection of the remaining wetlands is essential to ensure protection of native Hawaiian water birds, flood control, ground water recharge, and aesthetic values.

Kawainui Marsh is the largest remaining freshwater wetland in the State of Hawai'i and provides flood control and sediment filtration that protect urbanized areas of Kailua and the Kailua Bay ecosystem. It also accommodates important habitat for endangered endemic waterbirds and several species of migratory shorebirds and waterfowl, and contains numerous cultural and

historical resources. Kawainui Marsh's intrinsic values therefore make it a critical location for wildlife protection, watershed interpretation and education, and an area rich in cultural and historical resources.

Despite its rich environmental and cultural resources, challenges with management and maintenance have resulted in an invasion of alien species, overgrowth of vegetation, limited public access, and minimal publically supported interpretive and educational programs. Currently, California grass, water hyacinth, Kariba weed and cattail are choking waterways and native emergent vegetation. This has severely curtailed habitat for endemic Hawaiian waterbirds foraging and nesting. In addition to the lack of bird habitat, there is also a lack of venues for public access, and public interpretive and educational programs. Storm water runoff from Kapa'a Quarry Road is causing erosion of upland areas contributing to increased discharges of sediment and other materials into the marsh.

DOFAW is committed to the preservation, protection, and enhancement of the natural and cultural resources of Kawainui Marsh. As a result, this project represents a first step to restore the marsh and enhance its habitat. The primary project objectives addressed by restoration plan actions include:

- Restore native wetland habitat and naturalize Kahanaiki Stream. After gradual removal of invasive vegetation, various types of native plants would be used to re-vegetate the wetland area and the upland

slope along Kapa'a Quarry Road.

- Restore native bird habitat and effectively control predation of native birds.
- Mitigate drainage failure and reduce erosion entering the marsh by addressing existing storm water runoff from Kapa'a Quarry Road.
- Ensure efficient DOFAW maintenance operations and improve their maintenance capabilities to sustain a remediated native ecosystem.
- Accommodate public access to the study area for passive recreational enjoyment of the environment.

### **3.2 DOFAW Grant Application**

The grant application prepared by DOFAW to fund the wetland restoration project focused on restoring habitat for native Hawaiian water birds, migratory shorebirds and waterfowl, and native fish species in Kawainui Marsh. It also included community outreach efforts to local organizations, businesses, schools and government agencies in order to integrate the wildlife sanctuary into the fabric of the community. Improvements would expand endangered water bird habitat by restoring and enhancing wetland and stream areas currently choked with a heavy growth of invasive vegetation. Restoration plans would also improve the hydrologic function of the wetland and stream areas benefiting a wide range of native species and improving the educational attributes of the site.

The grant application included restoration of about 60 acres of wetland and stream-bank habitat to support endangered Hawaiian stilts, gallinules, coots and ducks, as well as numerous species of migratory shorebirds and waterfowl. Stilt use is projected to increase from four birds and no nests to 60 birds and 20 nests; gallinules should increase from two birds and one nest to 40 birds and 20 nests; and coots should increase from no birds to 12 birds and 6 nests. Koloa and migratory shorebirds and waterfowl should increase from no birds to a multi-species complex utilizing the wetland on a seasonal basis.

Numerous (approximately 1,000) native sedges and other native species would be planted in the 60-acre wetland portion of the project area in accordance with the grant application. Upland slopes will be graded to address surface runoff discharging into the marsh, reduce erosion, and increase runoff detention prior to entry into the wetland area. Visitor access would be accommodated, and DOFAW's access within the area increased to improve maintenance and management operations.

Native trees (approximately 1,000) will be planted on the upland slopes and riparian areas as part of erosion control efforts and replacing invasive vegetation. The project area would be fenced (about 8,500 linear feet) for predator control and other control efforts implemented to bring the number of rats, mongooses and feral cats down to remnant levels. In the future, coordination with Le Jardin Academy, other schools, and educational and

cultural organizations would assist with programs and other research activities conducted at Kawainui Marsh.

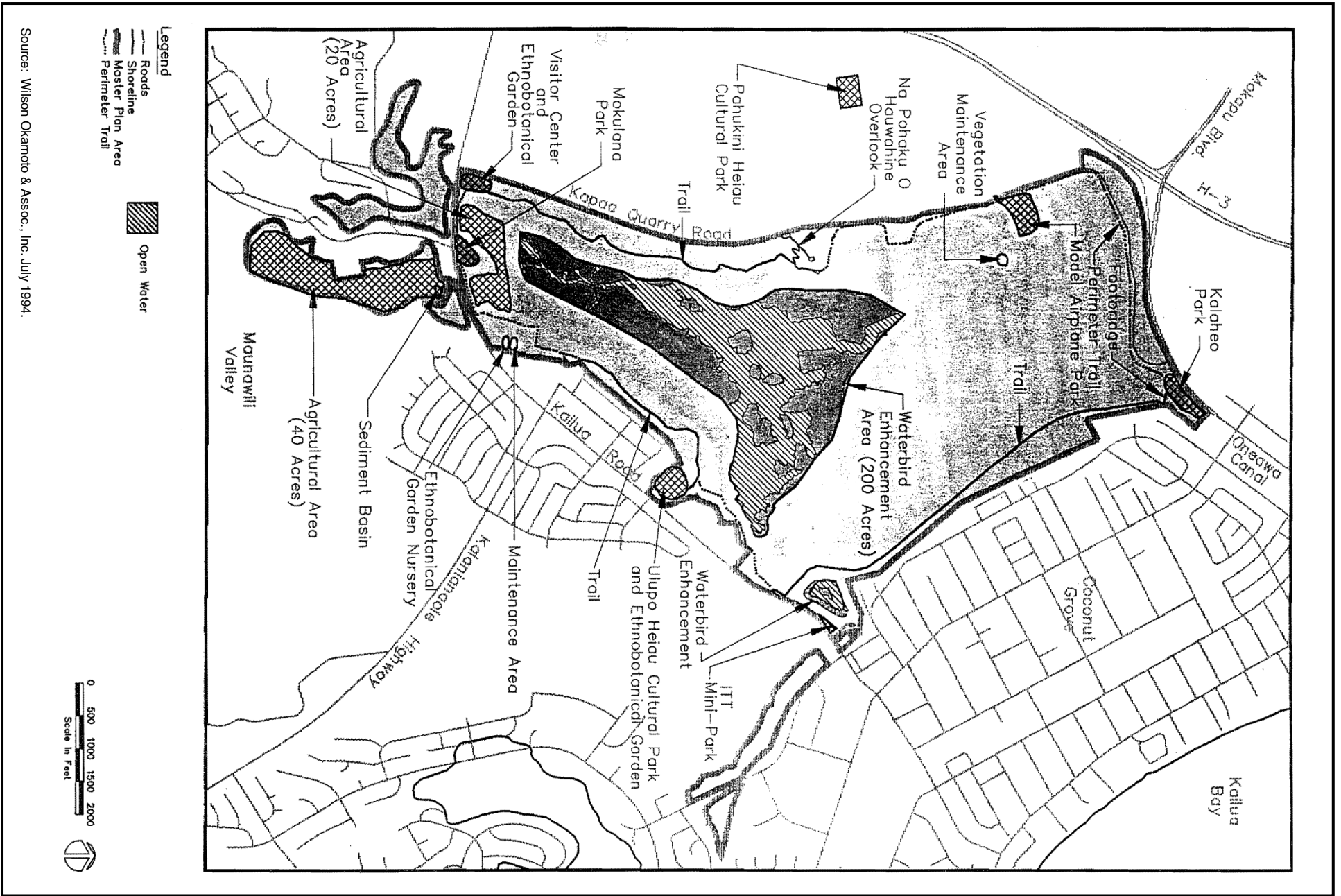
### 3.3 Existing Planning References and Documents

Several studies have been prepared for Kawainui Marsh over the years that create a baseline of information and guidance for future improvements and are important considerations for this restoration project. A summary of pertinent guidelines is provided below.

1. State DLNR Kawai Nui Marsh Master Plan; Report R-100 (July 1994).

The State DLNR, DOFAW published this master plan as an update to the Kawai Nui Heritage Plan prepared in October 1982. Figure 3.1 illustrates proposed improvements from the 1994 plan that are relevant to the study area for this report. Improvements included:


- A waterbird enhancement area generally corresponding to the current restoration project area. A buffer zone between upland areas and the waterbird habitat was also recommended.
- A 20-acre area for wetland agricultural use of the marsh generally surrounding the Mokulana peninsula situated along Kalaniana'ole Highway.



**DLNR Kawainui Master Plan (July 1994)**  
**KAWAINUI MARSH WETLAND RESTORATION AND HABITAT ENHANCEMENT PLAN**  
 KAILUA, O'AHU

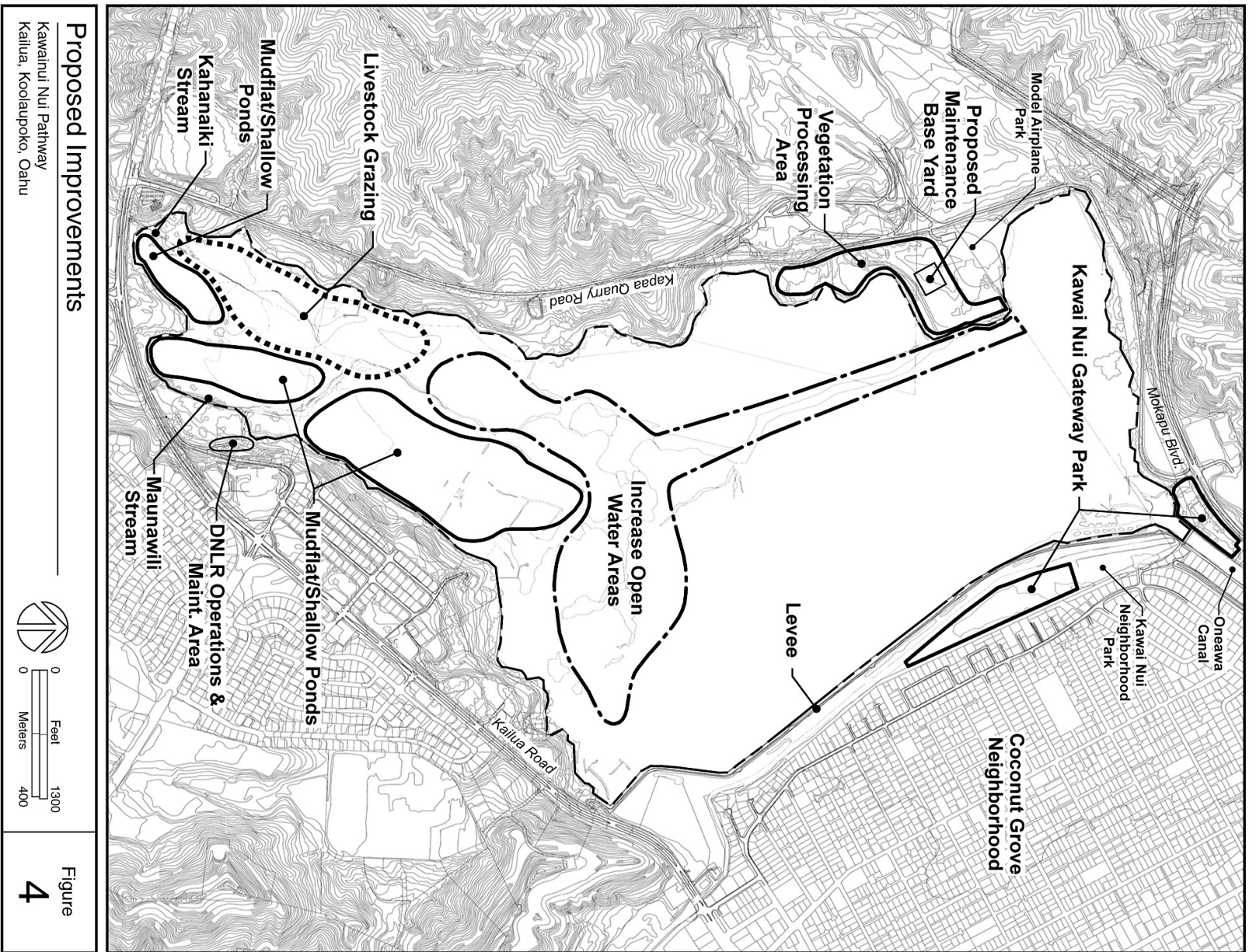
**Figure 3.1**

Prepared for:  
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 Division on Forestry and Wildlife



- A visitor center and ethnobotanical garden at the intersection of Kalaniana'ole Highway with Kapa'a Quarry Road. A trail was shown extending northbound paralleling Kapa'a Quarry Road from the visitor center generally situated within the project's upland area.
2. State DLNR Management Plan for Kawai Nui Marsh (March 2000).
- The State DLNR, Land Division published a management plan for the marsh under a Final Environmental Assessment that was part of their acquisition of property from the City and to continue implementation of the 1994 master plan recommendations. Figure 3.2 highlights recommendations from the DLNR management plan. These include:
- Provide for long-term maintenance activities to assure the protection and enhancement of the marsh's flood control capabilities.
  - Provide a maintenance facility and a vegetation processing area south of the existing model airplane park to augment existing operations,
  - Restore wildlife habitats in the marsh.
  - Create about 70 acres of mudflats and shallow ponds in three areas in the southern portion of the marsh in coordination with the U.S. Army Corps of Engineers (COE).
  - Restore riparian wetland habitat along Maunawili and Kahanaiki Streams, vegetation clearing, and installation of fencing was proposed.
3. Kawai Nui Marsh Pathway Plan (May 2001).
- The Kailua Community Vision Team funded a study to plan a pathway around the marsh in accordance with recommendations from the 1994 master plan. Figure 3.3 graphically shows proposed improvements from this pathway plan associated with the wetland restoration project area. Elements include:
- A multi-purpose pathway for pedestrians and bicyclists along Kapa'a Quarry Road.
  - A pedestrian trail within the upland area below Kapa'a Quarry Road extending from a visitor center site (as proposed in the 1994 plan). The trail extended along the highway and around the Mokulana Peninsula toward Castle Medical Center.
  - A boardwalk and viewing platform extending into the marsh from the visitor center site.
4. Second Draft Revised Recovery Plan for Hawaiian Waterbirds (May 2005).
- The latest draft of the U.S. Fish and Wildlife Service recovery plan addresses four species of Hawaiian waterbirds listed as endangered. Key findings include:
- Kawainui Marsh is listed as a "Core Wetland" which is an area providing habitat essential for supporting larger populations of Hawaiian waterbirds.
  - Expansion of open water areas would facilitate use by all four endangered waterbird species, which now use the area only in small numbers.






Source: Helber Hastert & Fee, Planners, March 2000.

DLNR Management Plan Improvements (March 2000)

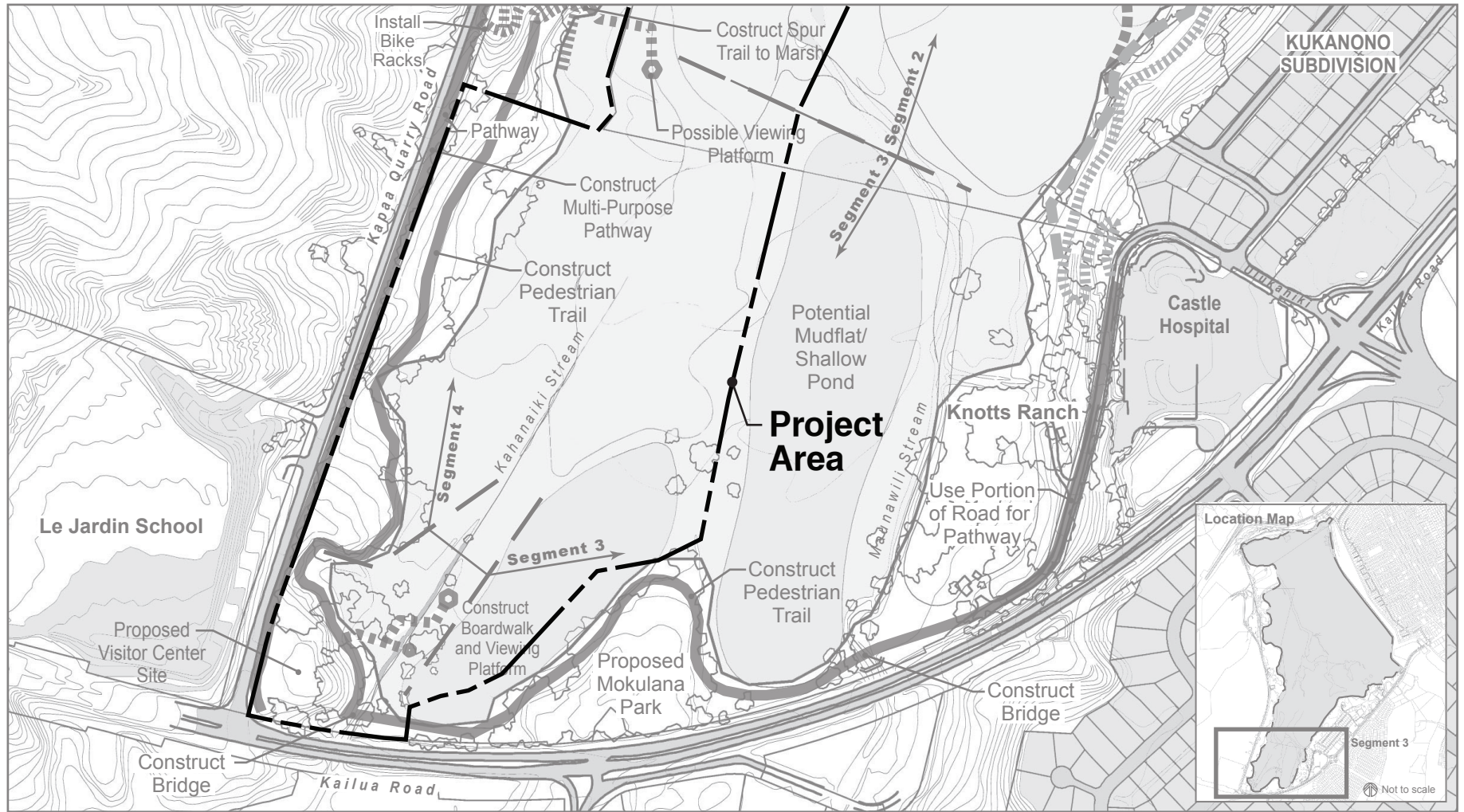
KAWAINUI MARSH WETLAND RESTORATION  
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KAILUA, O'AHU

Figure 3.2

Prepared for:  
State of Hawai'i  
Department of Land and Natural Resources  
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Source: Helber Hastert & Fee, Planners, May 2001.

Not to Scale

**Kawainui Pathway Plan (May 2001)**  
**KAWAINUI MARSH WETLAND RESTORATION**  
**AND HABITAT ENHANCEMENT PLAN**  
 KAILUA, O'AHU

**Figure 3.3**

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- Recommended recovery actions included implementing management plans, securing water sources and managing water levels, managing vegetation, reducing and monitoring predator populations, minimizing human disturbances, monitoring and controlling avian disease, monitoring populations, and removing the threat of mallard-Hawaiian duck hybridization.
5. DOFAW Hawai‘i’s Comprehensive Wildlife Conservation Strategy (October 2005).  
The DOFAW plan comprehensively reviewed the status of a full range of the State’s native terrestrial and aquatic species. It presented strategies for the long-term conservation of species and their habitats. Management actions and future needs for Kawainui Marsh identified include:
- Current Management Needs: Hydrologic studies, habitat restoration, including invasive plant removal, native wetland planting, and predator control.
  - Future Needs: Continue existing management, secure adequate funding to support expanded management (increased predator control, invasive weed removal, habitat restoration, educational opportunities).
6. State Comprehensive Outdoor Recreation Plan 2008 Update (April 2009).  
The State DLNR published this update of the plan as part of Federal LWCF program requirements. The technical reference document serves as a tool for statewide outdoor

recreational planning, leadership, and action. Relevant parts of the plan include:

- Recognition of Kawainui Marsh as a State wetland of importance and popular for outdoor recreation (walking, jogging, biking). It notes that the marsh has potential for further recreational value based on recommendations from the 1994 master plan.
- ‘Ahahui Mālama I Ka Lōkahi was identified as an organization that has taken the lead in developing educational activities and service learning projects at the marsh.

### **3.4 Consultations with Agencies and Community**

Consultation with several government agencies and community organizations was conducted to solicit public input and comments on restoration improvements proposed at Kawainui Marsh. Community consultations included a public informational meeting and presentations to the Kailua Neighborhood Board, and Ho‘olaulima Iā Kawainui Board. A summary of major issues or requirements contributing to the planning framework are listed below.

1. Identified various agency permits triggered by restoration efforts in the wetland along with crossing streams which may be required for maintenance operations.
  - Plans for invasive vegetation removal methods along with re-vegetation using native plants were modified based on permit requirements triggered by such actions.

- Information on a delineated wetland boundary is necessary so that jurisdictional boundaries can be determined when evaluating project improvements.
2. An outdoor recreation component needs to be included in the restoration plans due to requirements associated with the Federal Land and Water Conservation Funds (LWCF). Such recreational component should include public access to the study area.
  3. Other components that should be included or addressed as part of the restoration plans include: 1) a resource management component addressing staffing and funding to maintain the natural resource; 2) the concept of adaptive management should be incorporated to maintain flexibility with operations over time; and 3) culvert improvements along Kapa‘a Quarry Road should serve as best management practices to reduce discharges into the marsh.
  4. A Memorandum of Agreement between the Board of Land and Natural Resources and ‘Ahahui Mālama I Ka Lōkahi establishes a cooperative effort to provide educational and interpretive opportunities for the public about the natural and cultural resources of Kawainui Marsh.
  5. Information on DOFAW’s management and operation of the marsh should be included.
  6. Re-establishing taro *loi* within the marsh for use by cultural practitioners was suggested for consideration.
  7. Potential historic sites associated with former ‘*auwai* may be present in the wetland. Therefore, consideration should be given to minimizing impacts from restoration activities.

### 3.5 Conceptual Restoration Plan Guiding Principles

A number of guiding principles were developed to guide preparation of the restoration plan for Kawainui Marsh. These principles were established based upon the planning references and documents, community and agency consultations, and evaluation of existing site conditions. These principles are listed below.

1. Removal of invasive vegetation within the wetland will be implemented in phases due to the size of the area and available DOFAW staffing.
2. Adaptive management concepts should be incorporated into the plan to provide DOFAW with options and flexibility to modify restoration activities.
3. Resource management information should be incorporated to support DOFAW efforts to maintain the study area after restoration activities are completed.
4. An extensive row of vegetation (hau trees) along Kapa‘a Quarry Road should be retained and enhanced with native vegetation to retain the visual buffer from the marsh. The northern section of upland area improved by DOFAW provides a canopy of trees that should be enhanced with selective tree removal and planting of native vegetation.
5. A variety of native plants should be identified as part of restoration plan for DOFAW’s consideration and implementation of re-vegetation efforts.



6. A gully at the southern end of the study area that receives storm water runoff from the roadway should be improved to allow for detention of water flow and to reduce sediment and other materials from entering the wetland.
7. Re-evaluation of the drainage conditions along Kapa‘a Quarry Road should be conducted to identify improvements needed to improve storm water runoff discharging into the marsh since existing drainage culverts are structurally deteriorated.
8. Accessible paths for DOFAW maintenance vehicles should be provided along the upland area.
9. Provisions should be incorporated into the plan to minimize potential impacts on historic sites.
10. Passive outdoor recreational components that increase public access (e.g., parking area, viewing locations, signage, and pedestrian trails) should be incorporated to satisfy LWCF requirements.
11. Restoration improvements should not preclude future implementation of recommendations from previous studies or plans.