DRAFT ENVIRONMENTAL ASSESSMENT

PROJECT TO REPLACE TEMPORARY WAINIHA BRIDGES

KŪHIŌ HIGHWAY

HALELEʻA DISTRICT, KAUAʻI ISLAND, HAWAIʻI

Project No. HI STP SR560(1)
TMK: [4] 5 (por.), 6 (por.), 7 (por.), and 8 (por.)
Kuhio Highway Right-of-Way

Submitted Pursuant to Hawaiʻi Revised Statutes, Chapter 343 and National Environmental Policy Act

State of Hawaii, Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, HI 96813

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APRIL 2016

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U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division

and

STATE OF HAWAII
Department of Transportation, Highways Division

DRAFT ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to:

(Federal) 42 U.S.C. 4332(2)(c)
(State) Chapter 343, Hawaii Revised Statutes

for
Project to Replace Temporary Wainiha Bridges
Kūhiō Highway, HI STP SR 560(1)
Kauai County, HI

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4/6/16
Date

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Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AASHTO	American Association of State Highway and Transportation Officials
ACM	asbestos-containing material
ADT	average daily traffic
ahupuaa	traditional land division
ALISH	Agricultural Lands of Importance to the State of Hawai‘i
amsl	above mean sea level
APE	Area of Potential Effects
BMP	Best Management Practice
CAA	Clean Air Act
CDP	census-designated place
CDUP	Conservation District Use Permit
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CE	Categorical Exclusions
CEQ	Council of Environmental Quality
CFR	*Code of Federal Regulations*
CFLHD	Central Federal Lands Highway Division
CIA	cultural impact assessment
CNPCP	Coastal Nonpoint Pollution Control Program
CO	carbon monoxide
CSD	context-sensitive design
CSS	context-sensitive solution
CWA	Clean Water Act
CWRM	Commission on Water Resource Management
CZARA	Coastal Zone Act Reauthorization Amendments
CZM	Coastal Zone Management
DAR	Division of Aquatic Resources
dBA	A-weighted decibels
DLNR	State of Hawai‘i Department of Land and Natural Resources
DOT	Department of Transportation
EA	Environmental Assessment
EEZ	U.S. Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDPA	Flood Disaster Protection Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FP	Standard Specifications for the Construction of Roads and Bridges on Federal Highways
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
FWPCA	Federal Water Pollution Control Act
HAR	Hawai‘i Administrative Rules
HDOA	State of Hawai‘i Department of Agriculture

HDOH	State of Hawai‘i Department of Health
HDOT	State of Hawai‘i Department of Transportation
HRS	Hawai‘i Revised Statutes
LRFD	Load and Resistance Factor Design
makai	oceanward
mauka	mountainward
MHI	Main Hawaiian Islands
MP	milepost
mph	miles per hour
MS4	municipal separate storm sewer system
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSAT	mobile source air toxics
MUS	Management Unit Species
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIA	National Flood Insurance Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	non-point source
NRCS	Natural Resources Conservation Service
NWHI	Northwestern Hawaiian Islands
NWI	National Wetlands Inventory
OEQC	State of Hawai‘i Office of Environmental Quality Control
$PM_{2.5}$	particulate matter <2.5 microns
PM_{10}	particulate matter <10 microns
ppb	parts per billion
ppm	parts per million
PEM	palustrine emergent
PFO	palustrine forested
REAP	Rain Event Action Plan
REC	Recognized Environmental Condition
SHPO	State Historic Preservation Officer
SMA	Special Management Area
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SWCA	SWCA Environmental Consultants
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TMK	Tax Map Key
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQC	water quality certification
WQS	water quality standards
WUS	waters of the United States

Project Summary

Table PS-1 contains a description of the project and applicable land-use designations.

TABLE PS-1
Project Summary

Project Name	Temporary Wainiha Bridges Replacement, Kūhiō Highway, Route 560, Island of Kauai
Proposing/Determination Agency	State of Hawaii Department of Transportation (HDOT) and Federal Highway Administration, Central Federal Lands Highway Division
Anticipated Determination	Finding of No Significant Impact (FONSI) under Hawaii Revised Statutes Chapter 343
Tax Map Key(s)	Wainiha Bridge 1: [4] 5-8-002:002 por.; [4] 5-8-006:030, 031, 032, 033, 046, 060, and 999 por. Wainiha Bridge 2-3: [4] 5-8-006:009, 011, 017, 018, 019, 030, 999 por.; [4] 5-8-007:023, 024, 031, 032, 999 por. Wai'oli Bridge: [4] 5-5-005:005, 007, 021, 028, 999 por.; [4] 5-5-006:014, 888 por.; [4] 5-6-002:002, 004, 999 por. Waipā Bridge: [4] 5-6-004:014, 022, 023, 999 por. Waikoko Bridge: [4] 5-6-003:002, 999 por. Potential Staging Areas 1 and 2: [4] 5-7-003:003, 999 por.
Existing Uses of the Project Corridor	Roadway through vegetated, undeveloped and rural residential land
State Land Use	Conservation District and Agricultural District
Special Management Area	Yes
Kauai General Plan	Open, Agriculture, and Residential Community Designation
Zoning	Open, Agriculture, and Residential Community Districts
Proposed Project	The proposed project includes the replacement of three temporary "ACROW Panel" modular steel bridges on Kūhiō Highway (Route 560) near the mouth of the Wainiha Stream on the island of Kaua'i. The existing Wainiha temporary ACROW structures would be replaced with new one-lane bridges that closely match the existing horizontal alignment. A slight curve improvement between Bridges 2 and 3 would be provided, and the elevation of the road and bridges would be lowered closer to pre-ACROW conditions. The new bridges would be more visually consistent with the surrounding roadway corridor. Traffic during construction would be maintained *makai* of the Wainiha bridges. The project also involves the placement of temporary structures adjacent to or over Waioli, Waipa, and Waikoko streams to accommodate construction loads. All temporary structures would be removed upon completion of the project, and the sites restored. Scour protection, approach road re-paving, utility relocations, and temporary staging areas are also included in the project.
Anticipated Impacts	Short-term construction related impacts (noise, dust, erosion, and traffic) would occur, but the implementation of best management practices would minimize the effects to the environment. Eleven federally and state listed wildlife species have the potential to occur within the project limits, but restrictions on the timing of construction and minimization of the project footprint would preclude any long term effects to the species. No adverse effects would occur to Essential Fish Habitat or adjacent Hawaiian monk seal critical habitat. Historic architectural resources and archaeological resources would not be adversely affected, and archaeological monitoring would be performed during ground-disturbing activities.

Preface

The proposed project involves replacing the temporary Wainiha Bridges along Kūhiō Highway (State Route 560) at approximate Mileposts 6.4 and 6.7, which is located in the Halele'a District on the island of Kaua'i. As the proposed project would involve the use of State funds and State lands (comprising the Kūhiō Highway rights-of-way, under the jurisdiction of the State of Hawai'i Department of Transportation), compliance with Hawai'i Revised Statutes (HRS) Chapter 343 is required. This Draft Environmental Assessment (EA) has been prepared pursuant to HRS Chapter 343 (as amended), and Hawai'i Administrative Rules Title 11, Chapter 200.

The project would also use Federal funding provided by the U.S. Department of Transportation Federal Highway Administration (FHWA). Use of federal funds subjects the project to environmental documentation requirements set forth under the National Environmental Policy Act (NEPA) of 1969, (42 U.S. Code Section 4321), the Council of Environmental Quality Regulations, 40 *Code of Federal Regulations* (CFR) Parts 1500-1508, and 23 CFR Parts 625, 640, 712, 771, 774, and 790. This EA is therefore also being prepared to comply with NEPA.

SECTION 1

Introduction and Purpose and Need

1.1 Proposing Agency and Action

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA-CFLHD), in partnership with the State of Hawai‘i Department of Transportation (HDOT), proposes the replacement of three temporary “ACROW Panel” modular steel bridges on Kūhiō Highway (Route 560) near the mouth of the Wainiha Stream on the island of Kaua‘i. This joint Draft Environmental Assessment (EA) has been prepared to analyze the impacts of implementing this action consistent with the National Environmental Policy Act (NEPA) and Chapter 343 of the Hawai‘i Revised Statutes (HRS). FHWA is the lead agency responsible for compliance with NEPA and HDOT is the proposing agency under Chapter 343 of HRS. This project would replace the three existing temporary modular steel bridges (hereafter referred to as “ACROW” bridges) with three new permanent one-lane bridges. The new structures would be situated to closely match the existing horizontal roadway alignment, and would be designed to meet structural requirements and address some of the existing operational and maintenance conditions. Aesthetic design elements would be incorporated into the project to balance modern project improvements with the historic roadway corridor.

The project involves both state funding from HDOT and federal funds from FHWA. This project is included in a Program of Projects Memorandum of Agreement between FHWA-CFLHD, HDOT and FHWA, Hawai‘i Division. Through this partnership, FHWA-CFLHD is responsible for project delivery through construction completion, including design, environmental compliance, and construction delivery and oversight. FHWA-CFLHD will therefore advertise and manage the construction of this project, if the project is approved by both FHWA-CFLHD and HDOT.

1.2 Project Background

1.2.1 Project Location

The project is located along Kūhiō Highway (Route 560) at approximately milepost (MP) 6.4 and MP 6.7 near the mouth of the Wainiha Stream before it feeds into Wainiha Bay on the island of Kaua‘i, Hawai‘i (see Figure 1-1). The three existing temporary Wainiha bridges are referred to as Wainiha Bridges 1, 2, and 3. Bridge 1 is located at MP 6.44 and is the easternmost bridge located closest to Hanalei. Bridges 2 and 3 are located at MP 6.7 and MP 6.73, respectively, situated at the intersection with Ala Eke Road towards Hā‘ena. The structures and highway are under the jurisdiction of HDOT. Kūhiō Highway is classified as a rural minor arterial in the project area and provides the only automobile access to residential homes, businesses, and several recreational opportunities. The average daily traffic (ADT) in 2010 was approximately 3,790 vehicles per day. Among the popular destinations reached via Kūhiō Highway is Hā‘ena Beach Park, Hā‘ena State Park and its popular Kē‘ē Beach, as well as the trailhead to Kalalau Trail and the Nāpali Coast State Wilderness Park. Hā‘ena State Park is located approximately 3.5 miles past the project and is the end terminus of Kūhiō Highway on the North Shore.

Due to Kūhiō Highway terminating west of the project, construction access can only be provided from east of the project location. East of the project along Kūhiō Highway, there are three load-restricted bridges that present challenges for heavy construction equipment to access the project site. These include the Wai‘oli Bridge at MP 3.39, Waipā Bridge at MP 3.90, and Waikoko Bridge at MP 4.22 (see Figure 1-1). These three bridges are also being evaluated as part of the project area so that construction access can be addressed.

Figure 1-1. Project Location Map

The project area includes six bridges included in five project sites; Bridges 2 and 3 are combined into one site. In addition, two previously disturbed areas have been identified as potential staging areas. The project area encompasses the following Tax Map Keys (TMK) by site.

- Wainiha Bridge 1: [4] 5-8-002:002 por.; [4] 5-8-006:030, 031, 032, 033, 046, 060, and 999 por.
- Wainiha Bridge 2-3: [4] 5-8-006:009, 011, 017, 018, 019, 030, 999 por.; [4] 5-8-007:023, 024, 031, 032, 999 por.
- Waiʻoli Bridge: [4] 5-5-005:005, 007, 021, 028, 999 por.; [4] 5-5-006:014, 888 por.; [4] 5-6-002:002, 004, 999 por.

- Waipā Bridge: [4] 5-6-004:014, 022, 023, 999 por.
- Waikoko Bridge: [4] 5-6-003:002, 999 por.
- Potential Staging Areas 1 and 2: [4] 5-7-003:003, 999 por.

1.2.2 Existing and Surrounding Uses

The existing and surrounding uses are depicted on Figure 1-2.

Existing uses within the project area include the existing transportation corridor and immediate adjacently zoned Open and Residential lands. Private residential parcels are present on the *mauka* (mountainward) side of Bridges 1, 2, and 3. Undeveloped County of Kaua'i lands are located *makai* (oceanward) of Bridges 1, 2, and 3. Interspersed among residential homes are relatively well-vegetated lands with plants such as hau and guinea grass. Private residential properties surround the Wai'oli Bridge, *mauka* and *makai*, and are also present *mauka* of the Waipā Bridge. *Makai* of the Waipā Bridge are undeveloped County of Kaua'i lands as well as an undeveloped and vegetated State of Hawai'i land parcel. Waikoko Bridge is surrounded with residential parcels on the *mauka* side and abuts undeveloped beach on the *makai* side. Further *mauka* of the road at Waikoko, Wai'oli, and Waipā bridges are lands zoned as Agriculture.

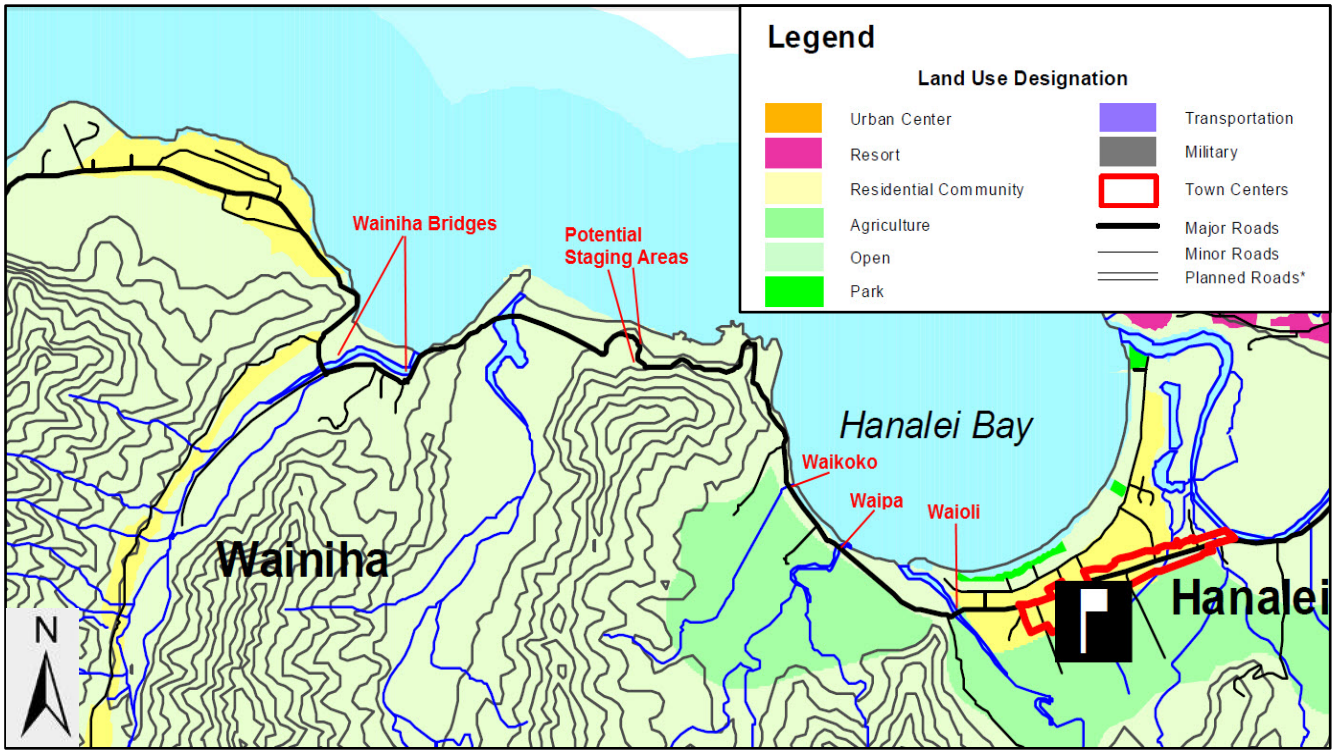

Figure 1-2. Project Location and Surrounding Land Uses
(Source: County of Kaua'i 2001)

1.2.3 Project History

1.2.3.1 History of Wainiha Bridges

One-lane bridges have been present in the Wainiha area on the North Shore section of the Kūhiō Highway, also known as the Kaua'i Belt Road, since 1904 when the original Wainiha Bridges 1 and 3 were constructed. In 1924, an alternate stream channel for Wainiha Stream was created during a storm and an additional bridge was required. This new bridge, Bridge 2, was completed in 1931. Wainiha Bridges 1, 2, and 3 were timber through-truss, one-lane bridges. In 1946 and 1957, tidal waves damaged all of the Wainiha bridges except the east span of Bridge 3. All damaged bridges were replaced or repaired in 1957, and then in 1966 the east span of Bridge 3 collapsed and was replaced. The style of the new bridges erected in the 1950s and 1960s were steel truss, with timber decks and rails, and are the historic, pre-ACROW bridges many local residents have come to know. The historic pre-ACROW Bridge 3 is shown to the right (HDOT 2012).

Historic pre-ACROW Bridge 3

These three bridges were again affected by storm events and structural failures in 2004 and 2007. The Governor signed a proclamation on September 22, 2004 and another one on October 29, 2007, allowing these bridges to be replaced with temporary bridges. The 2007 proclamation stated that the design of the permanent repairs had been delayed "by the need to balance safety requirements with concerns regarding historic preservation and community preferences for maintaining the horizontal alignment and single lane nature of the Bridges" (State of Hawai'i 2007). The bridges were replaced with temporary ACROW bridges in 2004 (Bridge 2) and 2007 (Bridges 1 and 3) so that critical access could be provided while design and compliance for permanent structures is completed. The existing ACROW structures are shown below.

Existing ACROW Bridge 1

Existing ACROW Bridge 3

1.2.3.2 Significance of the Kaua'i Belt Road

The North Shore section of Kūhiō Highway was listed in the Hawai'i Register of Historic Places in 2003 and the National Register of Historic Places in 2004 for its significance in the areas of engineering, transportation, and social history. Nomination of the road to the National Register was made by the Hanalei

Roads Committee, a local non-profit committed to the protection of the North Shore's Kaua'i Belt Road. Notable significant characteristics of the roadway include the following:

- Almost unchanged alignment of the road since its completion in the early 1900s
- Original or historic width and frequent absence of shoulders, as were the conditions in the late 1920s
- Presence of numerous one-lane bridges representing the construction methods and material type of their original period of construction
- Guardrail and barrier walls that were constructed of timber-beam/concrete-pot or masonry rock construction

Prior to the state's emergency actions to remove the historic bridges and replace them with ACROW bridges, full historic engineering documentation was prepared.

Aside from the historical significance of the road, the beautiful North Shore of Kaua'i offers breathtaking scenery, strong community character, and a serene and unhurried lifestyle. Much of this is thought by the community to be attributed to the narrow, winding roadway and series of one-lane bridges that begin once you descend into the valley. The road holds a special place as a component of the North Shore lifestyle.

1.2.3.3 Wainiha Bridges Project Planning Efforts

In 2005, HDOT prepared the Kūhiō Highway (Route 560) Historic Roadway Corridor Plan to provide a framework for decision-making and actions on Kūhiō Highway. The general framework was that HDOT shall "exercise context-sensitive design (CSD) and harmonize improvements with natural features, scenic amenities, and historic elements of the highway corridor" (HDOT 2005). In 2012, HDOT prepared an Engineering Design Report for the Rehabilitation of the Wainiha Bridges. Efforts to develop this report involved several engagements with local and community stakeholders including the Hanalei Roads Committee, the State Historic Preservation Division, emergency response providers, and the residents of the community. Engineering analyses and studies were also prepared that resulted in preliminary engineering recommendations for the project (HDOT 2012).

In 2014, FHWA-CFLHD began preparation of environmental and engineering studies to advance project development actions and prepare necessary environmental documents. Background plans and documents related to the roadway and project were closely evaluated. Consistent with the approach to Context-Sensitive Solutions (CSS), FHWA-CFLHD sought to understand the historic, cultural, aesthetic, and environmental characteristics that are valued and important to the local community. This input provided the framework to identify the balanced needs of the project.

A series of three public meetings were held to obtain input from the public to help develop the purpose and need, identify resources that may be impacted, and solicit feedback on alternatives being considered. The intent of the meetings was to validate and help clarify input previously provided through development of the Engineering Design Report, identify any new relevant information, and obtain specific feedback on proposed alternatives. Additional discussion on consultation and coordination efforts is provided in Chapter 7.

1.3 Project Purpose and Need

1.3.1 Purpose of the Project

The primary purpose of the project is to replace the three temporary Wainiha bridges (referred to as Wainiha Bridges 1, 2, and 3) to maintain continued access along Kūhiō Highway.

Secondary Purposes

Additional issues have been identified through engineering evaluation and agency and public outreach. To address these issues through project design, secondary project purposes have been developed. These include the following:

- Improve operations;
- Manage maintenance requirements; and
- Balance project improvements with the character of the historic roadway corridor.

1.3.2 Need for the Project

Structures to replace the temporary Wainiha bridges are needed to maintain access. The previous bridges at these three locations were replaced with temporary prefabricated, modular (ACROW) bridges after Bridge 2 suffered permanent damage and Bridge 1 (the southernmost bridge) and Bridge 3 (the northernmost bridge) were determined to be structurally deficient. The ACROW bridges were installed as a temporary measure to keep the roadway open until design and environmental compliance for the new structures could be completed. The bridges were not intended to serve as permanent structures. There are no other available roads that provide access to the residential and recreational properties west of the Wainiha Bridges. Continued access along Kūhiō Highway is essential.

Photo of existing Bridges 2 and 3 and how they operate as one bridge

Secondary Project Needs
Secondary needs have also been identified with relation to operations, maintenance, and the balance between project improvements and the character of the historic roadway corridor. These secondary needs are described in more detail, below.

Operations: Bridges 2 and 3 do not currently operate efficiently.
One-lane bridges operate most efficiently when there is clear visibility through and across the bridge so that travelers can see if vehicles are on or are waiting to cross the bridge. Operational issues are noticeable at this location because Bridges 2 and 3 operate essentially as one bridge due to the short section of roadway between the two. Design considerations have been noted to contribute to some of the operational issues. The current bridges hinder visibility due to the taller rail height and narrower rail spacing as compared to the previous bridges. The elevation of the roadway and the bridge decks with the temporary bridges may also contribute to visibility issues. Lastly, vegetation near the bridges also negatively affects visibility when it becomes overgrown. Because visibility is diminished, vehicles sometimes enter the two bridges simultaneously and one vehicle is forced to back up to provide a travel-way for the other. Conflicts and road rage can regularly arise.

Kūhiō Highway is the only public route which provides transportation through the Wainiha Stream area to residential and recreational areas in the Wainiha and Hā‘ena area. Safe access is essential for general ingress and egress, as well as for emergency vehicles and all traffic in the event of emergency evacuations.

Maintenance: Ongoing maintenance requirements need to be manageable.

In order for HDOT to effectively manage funds for infrastructure across the state and to ensure facilities are able to be maintained in proper condition for their intended design life, long-term maintenance requirements need to be considered in project planning. Frequent maintenance was necessary for the original bridges. The timber deck and railings needed frequent repairs or replacement due to weathering and as a result of collision damage from errant vehicles. Maintenance efforts have been reduced following the placement of the temporary ACROW structures; however, continued maintenance is still required in the form of rail repairs and tightening of bolts on the modular steel structures. Foliage clearing also continues to be necessary to maintain sight distance.

Resiliency and maintenance of structure from regular use is a consideration, especially due to the tight navigation

Historic Considerations: Future proposed improvements need to consider the context of the historic roadway in project design.

The historic Kūhiō Highway, also referred to as the Kaua'i Belt Road, is listed in the National Register of Historic Places as a historic district for its state and local significance in the areas of engineering, transportation, and social history. The Kaua'i Belt Road, North Shore section, is the only remaining intact example of the old belt road system on the island of Kaua'i. The road, from Princeville to Hā'ena, retains historic integrity in its original road alignment, narrow lanes, bridges, and spectacular setting along Kaua'i's north coast. Due to the road's significance and its continued ability to provide motorists a pleasing, scenic journey much as it did in the early twentieth century, it is acknowledged that any proposed improvements should take into consideration the historic character of the roadway.

1.4 Purpose of the Environmental Assessment

This Draft Environmental Assessment (EA) discloses the environmental and cultural impacts that may result from the project's implementation, and commits to specific mitigation measures. The Draft EA has been prepared to satisfy the requirements of HRS Chapter 343 and Hawai'i Administrative Rules (HAR) Title 11, Chapter 200, Environmental Impact Statement (EIS) Rules, and other environmental compliance requirements, as well as the federal National Environmental Policy Act (NEPA) and implementing regulations.

The proposed project triggered the rules and regulations for environmental review because the project would use State lands and State funds. This project is also federally funded and triggered NEPA and other federal environmental compliance regulations. FHWA's regulations do not discern between a Draft EA and Final EA as the HRS Chapter 343 process defines; however, this Draft EA serves simply as the EA for purposes of federal compliance.

1.5 Public Comment on the Environmental Assessment

The Hawai'i Office of Environmental Quality Control (OEQC) notifies the public when a Draft EA is available for review in its bimonthly bulletin, the OEQC *Environmental Notice*. Official announcement by the OEQC will initiate a 30-day review and comment period.

Request for Comments

Interested members of the public are invited to submit written comments on the Draft EA to:

Name: Michael Will, Project Manager, FHWA-CFLHD

Address: 12300 West Dakota Ave., Suite 380
Lakewood, CO 80228
Email Address: Michael.will@dot.gov

1.6 Permits, Approvals, and Compliance Required or Potentially Required

The following requirements must be met to implement the proposed project:

1.6.1 Federal

- Department of the Army Permit (Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act [CWA]), U.S. Army Corps of Engineers (USACE)
- Section 106 Consultation (National Historic Preservation Act [NHPA]), Hawai'i Department of Land and Natural Resources (DLNR) State Historic Preservation Officer (SHPO)
- Section 7 Consultation (Endangered Species Act [ESA]), U.S. Fish and Wildlife Service (USFWS); National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS)
- Essential Fish Habitat Consultation (Magnuson-Stevens Fishery Conservation and Management Act), National Marine Fisheries Service
- Section 4(f) (U.S. DOT Act), Federal Highway Administration (FHWA)

1.6.2 State

- Section 401 Water Quality Certification, State of Hawai'i Department of Health (HDOH)
- National Pollutant Discharge Elimination System (NPDES) Permit, HDOH
- Stream Channel Alteration Permit, DLNR Commission on Water Resource Management
- Coastal Zone Management Act Federal Consistency Review, Office of Planning, Hawai'i Department of Business, Economic Development, and Tourism
- Conservation District Use Permit (CDUP)(HAR §13-5), DLNR
- Historic Preservation Review (HRS Chapter 6E), DLNR State Historic Preservation Officer (SHPO)
- Americans with Disabilities Act Review (HRS §103-50), HDOH, Disability and Communication Access Board (DCAB)
- Occupancy and Use of State Highway Right-of-Way Permit, HDOT
- Community Noise Permit/Variance, HDOH

1.6.3 County

- Historic Preservation Review (NHPA Section 106 and HRS Chapter 6E), Kaua'i Historic Preservation Review Commission, Kaua'i Planning Department
- Special Management Area (SMA) (HRS Chapter 205A), including Shoreline Setback Determination, Kaua'i Planning Department
- Compliance with floodplain management requirements, Kaua'i Department of Public Works
- Grading, grubbing, and stockpiling permits, Kaua'i Department of Public Works

SECTION 2

Alternatives

2.1 Introduction

This chapter describes the proposed action and the project alternatives that were developed to meet the project purpose and need while avoiding or minimizing environmental impacts. The alternatives evaluated in this EA include the No Action Alternative and one Action Alternative (Proposed Action). This chapter also describes the alternative development process and the alternatives considered early in project planning but not carried forward for detailed analysis in this EA.

2.2 Description of Alternatives

2.2.1 No Action Alternative

The National Environmental Policy Act (NEPA) requires agencies to analyze the consequences of taking no action, which is represented by the No Action Alternative. The No Action Alternative does not meet the purpose and need, but is carried forward as a baseline for comparing the consequences of the Action Alternative.

Under the No Action Alternative, the proposed project would not occur. The existing ACROW structures would be retained in their current configuration, and would continue to operate inefficiently. The existing issues with the current structures, as described in section 1.3.2, would persist. The bridges would continue to be maintained by HDOT and would function as permanent structures, which is inconsistent with the original intent of the emergency placement of the ACROW structures.

2.2.2 Action Alternative (Proposed Action) – Replace the ACROW Bridges with New One-Lane Bridges on a Similar Alignment

As mentioned in Chapter 1, the primary purpose of the project is to replace the temporary Wainiha Bridges. The project also has secondary purposes to improve operations, manage maintenance requirements, and balance project improvements with the character of the historic roadway corridor. To attain this goal, the project would replace the temporary ACROW bridges with one-lane permanent bridges designed for a 75-year service life. The new bridges would closely match the existing horizontal alignment and would be located where the existing bridges stand. A proposed typical section of the roadway across the bridge is shown below in Figure 2-1.

To provide minor improvements to the operational and maintenance considerations, a slight curve improvement between Bridges 2 and 3 would be provided, and the elevation of the road and bridges would be lowered closer to pre-ACROW conditions. Structure materials and rail configurations have also been identified to help address some of the maintenance and visibility issues at the bridge sites. The bridges would still continue to function similar to existing conditions as one-way bridges with alternating traffic, and with Bridges 2 and 3 operating as one bridge for those continuing travel on Kūhiō Highway.

Bridge types and span lengths were evaluated closely to address site conditions, meet project hydraulic requirements and those set forth by the Federal Emergency Management Agency (FEMA), and minimize impacts to aquatic resources to the extent practicable as required by the Clean Water Act. This essentially is a consideration of bridge length, the number of spans required, and the depth of girders that may be required. The availability and long-term performance of bridge materials was also considered. Based on these factors, the preliminary proposed design is to use pre-cast concrete slabs, with cast-in-place bridge decks. The proposed bridge typical section of all three permanent one-lane bridges would accommodate a 14-foot roadway section from rail to rail, with an additional 1-½ feet on each side to support bridge rails and for hanging utilities.

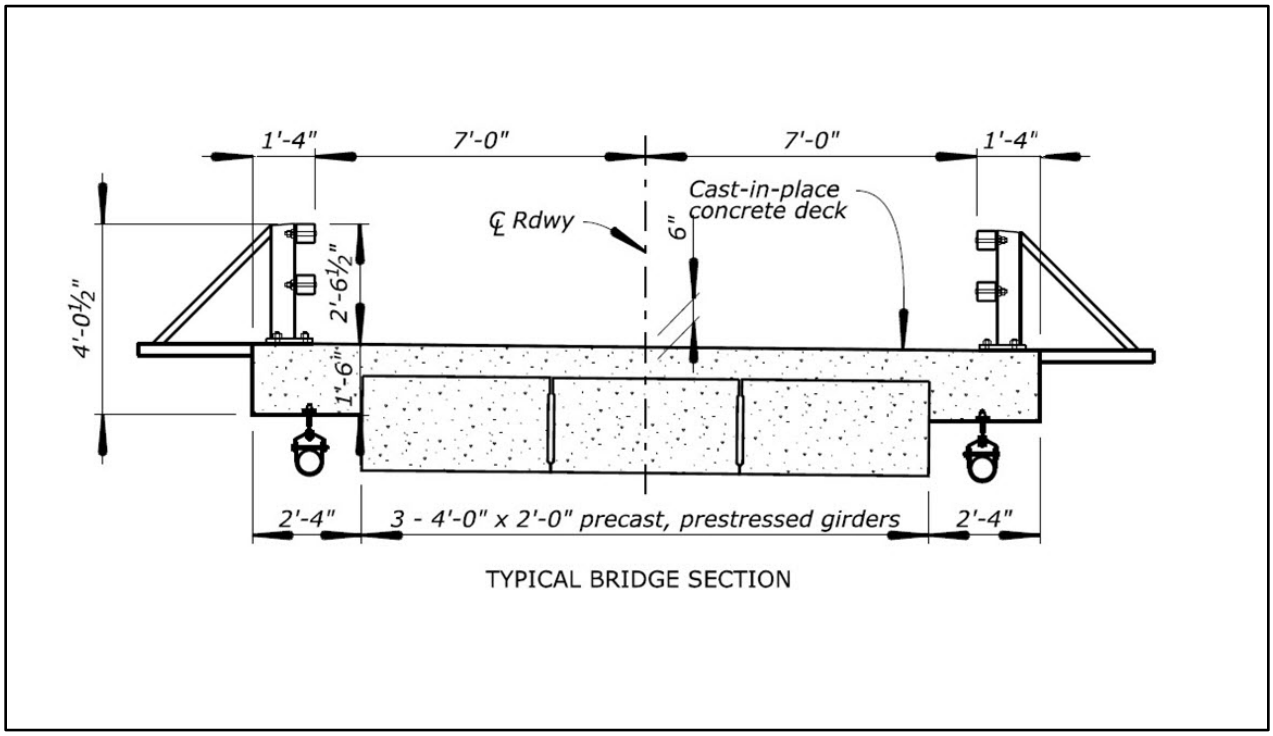

Figure 2-1. Proposed Typical Section

The new Bridge 1 would be single span (meaning no center piers being needed) and would be approximately 50 feet long. The new Bridge 2 would also be single span and would be approximately 87 feet long. Lastly, the new Bridge 3 would be three-span as the historic pre-ACROW bridges were, and be approximately 178 feet long. Table 2-1 below presents a summary of the proposed bridge sizes as compared to the existing ACROW bridges. Figures 2-2 through 2-7 at the end of this chapter depict the bridge sites and proposed preliminary design and bridge profile views (view from the side) for Bridges 1, 2, and 3.

TABLE 2-1
Comparison of Bridge Widths and Heights –Existing ACROW vs. Proposed Replacement Bridges

Bridge #	Curb- curb width		Out to out width*		Bridge Length		Height – Top of Deck to top of panel or rail	
	ACROW	Proposed	ACROW	Proposed	ACROW	Proposed	ACROW	Proposed
1	13’-7”	14’-0”	21’-6”	16’-8”	40’	50’	5’-4”	2’-6 ½”
2	12’-0”	14’-0”	18’-6”	16’-8”	100’	87’	5’-4”	2’-6 ½”
3	13’-7”	14’-0”	21’-6”	16’-8”	185’	178.5’	4’-11”	2’-6 ½”

***Note: out-to-out width for the replacement bridge does not include the rail diagonal.**

The overall scale of the proposed new Wainiha bridges compared to the ACROW bridges would be reduced. The lower overall height of the proposed new bridges is attributed mainly to the installation of crash-tested structural steel tube rails versus the taller, densely-spaced ACROW truss configuration. A rail type has been identified that offers visual similarities to the historic pre-ACROW bridges that existed prior to their emergency replacement. The proposed rail type and configuration offers sight distance advantages through

and above the bridges, as compared to the existing ACROW bridges. A visual rendering of the proposed Bridges 2 and 3 is shown below.

Visual Rendering of Proposed Bridges 2 and 3

Abutments for all three permanent bridges are anticipated to be supported on a reinforced concrete footing constructed below scour depth and supported on deep foundations (either drilled shafts or micropiles). Piers for Wainiha Bridge #3 would consist of either reinforced concrete walls on footings supported on deep foundations or reinforced concrete columns supported on drilled shafts. Foundations would be designed to current structural design standards. The existing timber foundations would not be re-used as they are of an unknown condition and there is no way of sufficiently evaluating their condition. Therefore, the historic piers and abutments would be removed to streambed level.

The bridges would be designed to current American Association of State Highway Transportation Officials (AASHTO) LRFD Bridge Design Specifications (2014), as amended by HDOT Bridge Design Criteria, and would meet current live load standards (HL-93). The bridges would also be designed to withstand the forces caused by wave action by coastal storms such as tsunamis, through adherence with the AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms (2008).

Preliminary hydraulic analyses indicate that because the proposed crossing characteristics are very similar to pre-ACROW conditions, the water-surface profiles and associated hydraulics are virtually identical for all flood flows evaluated. No rise in the base flood elevation is therefore anticipated.

Aesthetic design elements continue to be coordinated with the local community and SHPO. Elements that would be incorporated into the design include aesthetic rails with visual similarities to the pre-ACROW bridge rails, potential pier walls that may resemble the existing, and bridge decking treated with a timber-like appearance. Coordination on aesthetic design elements would continue through final design of the project.

There would be no improvements or changes to the existing travel lanes or shoulders beyond the project limits. Within the project limits, minor work including grading and repaving of the roadway approaches, driveways, and the approach from Ala Eke Road, would be included to appropriately tie into the new bridges.

2.2.2.1 Temporary Bridges at Waiʻoli, Waipa, and Waikoko Stream Crossings

Construction access to Bridges 1, 2, and 3 via the roadway can only be provided from east of the project location due to Kūhiō Highway terminating approximately 3.5 miles west of the project location. East of the project along Kūhiō Highway, there are three historic load-restricted bridges Waiʻoli (MP 3.39), Waipā (MP 3.90), and Waikoko (MP 4.22). For construction equipment to access the Wainiha Bridges, temporary crossings would be required at the load-restricted bridges as a part of this project. The one-lane Hanalei Bridge is also along Kūhiō Highway and east of the project; however, HDOT has previously retro-fitted this bridge to accommodate sufficient loads. No work is therefore necessary at the Hanalei Bridge.

Site conditions were evaluated to identify suitable temporary crossing locations while minimizing impacts to the streams, adjacent habitat, right-of-way, utilities, and traffic. Initial preliminary design has occurred for the purposes of assessing impacts and understanding constructability requirements. The description below captures the full scope and nature of potential actions for EA purposes. FHWA would further seek to refine and minimize impacts as design progresses after project approval.

At the Waiʻoli Bridge location, a temporary one-lane bridge would be constructed *mauka* of the bridge. This temporary bridge is anticipated to be approximately 100 to 160 feet long to span the stream channel. At the Waipā Bridge location, a temporary one-lane bridge would be constructed *makai* of the bridge. This temporary bridge is anticipated to be approximately 130 to 180 feet long. Lastly, at the Waikoko Bridge location, a temporary one-lane bridge would be constructed on-alignment and over the Waikoko Bridge to support construction loads while not touching or affecting the historic bridge.

No piers are anticipated; however, length limitations may require an abutment to encroach minimally into the stream channel on one or both sides of Waiʻoli Stream and Waipā Stream. No in-water work is anticipated at Waikoko Stream.

Shallow concrete footings are anticipated to support the temporary bridges. Abutment foundations such as gabion baskets or encapsulated reinforced granular fill may be used to support the spread footings; however, precast elements may be used by the contractor if available. Excavation would be necessary for construction of abutments, and vegetation clearing and limited grubbing would be necessary to launch the bridges across the stream as well as to accommodate construction vehicle access to and across the bridges. The temporary one-lane bridges and abutments would be removed once construction is complete, and temporarily impacted areas would be revegetated. Figures 2-8 through 2-10 depict the approximate temporary crossing locations.

The existing historic Waiʻoli, Waipā, and Waikoko bridges would not be altered or rehabilitated in any manner. The temporary bridges placed next to the Waiʻoli and Waipā would carry construction loads only.

2.2.2.2 Construction Activities

Maintenance of Traffic during Construction

There are no available detours around the project area; therefore, a temporary bypass would be provided adjacent to and *makai* of the highway at Bridges 1, 2, and 3 to accommodate traffic while the new bridges are being constructed. Temporary foundations and approaches would be constructed, and the temporary ACROW bridges would be relocated to serve as a stream crossing for vehicles. See Figures 2-11 and 2-12 at the end of this chapter for figures depicting the approximate location of the temporary bypasses.

Minor delays and short-term closures may be needed throughout construction. The progression of construction activities would move from the east at Waiʻoli Bridge to the westernmost bridges (Wainiha Bridges 2 and 3). Beginning at Waiʻoli Bridge, temporary foundations would first be constructed *mauka* of the roadway and then the temporary bridge would be installed. Due to the closeness to the roadway and for

safety of the traveling public, a roadway closure of up to a half-day would likely be required when the bridge is set. Moving west, at Waipā Bridge, a similar approach would be taken. A roadway closure of up to a half-day would likely be required when launching and setting the temporary bridge *makai* of the existing. When the construction crews reach the Waikoko Bridge, both foundation construction and setting of the bridge would need to occur during a full roadway closure due to the detour being up and over Waikoko Bridge. This would minimize impacts to the environment but would necessitate a longer closure of approximately 1 to 2 days. Once Wainiha Bridges 1, 2, and 3 are accessed, temporary foundations would be constructed *makai* of the existing bridges. The ACROW bridges would be physically relocated likely with a crane onto the temporary bypass alignment. This activity would also likely require a full one day closure for each location. Other intermittent road closures and traffic delays may be needed when equipment would pose a risk to the traveling public. Specific construction sequencing is not known until a construction contractor is procured, but for purposes of this EA a worst-case scenario is assumed from 6 to up to 12 full roadway closures. Opportunities would be sought to consolidate closures and schedule night work, when possible, to minimize impacts of roadway closures. This may involve night work from 6 to up to 12 nights to minimize impacts to the traveling public.

A traffic management plan would be developed for the project and approved by FHWA and HDOT. The plan would require provisions for emergency access throughout the construction duration, including periods of full roadway closure. Emergency access provisions would be developed and implemented with input from local emergency service providers.

A full public involvement program would also be developed in coordination with the contractor, FHWA, and HDOT that would include public meetings, mailings, radio announcements, flyers, and other similar materials so that project information is shared with the public throughout the duration of construction. All delays and closures would be relayed in advance to the public, relevant local agencies, and emergency service providers through mailers, newspaper announcements, posted signs, radio announcements, etc. Coordination with the North Kaua‘i visitor industry and Kaua‘i Visitors Bureau would also occur.

Utilities, Signage, and Lighting

Temporary traffic control and safety measures such as signage, temporary traffic signals or flashing signals would be in place as needed throughout construction. Utilities would also be temporarily relocated during construction within the project area, and then would be installed as needed across new bridge structures. Existing overhead power lines, telecommunication, and 6-inch waterlines occur in the project area and would be relocated. Furthermore, there are existing streetlights in the project area that are attached to power poles that may need to be relocated. FHWA would ensure relocated streetlights are appropriately shielded and in conformance with current U.S. Fish and Wildlife Service (USFWS) guidance. No additional permanent streetlights are anticipated beyond those that currently exist.

Staging and Equipment

Two potential offsite staging areas in previously disturbed areas along the roadway have also been identified and are included in the proposed action. These are shown in Figure 2-2. Staging would also likely occur at each bridge location.

Standard construction equipment would be used, such as track-mounted dozers, loaders, excavators, cranes, compactors, dump trucks, and pickup trucks. Demolition debris would require disposal at an approved landfill offsite.

Night work may occur and would be limited to project milestones that necessitate roadway closures, such as but not limited to, setting and removal of temporary structures. No night work would be scheduled during periods that would have an adverse effect on biological resources.

2.3 Alternatives Development Process

As described in Chapter 1, extensive coordination related to the proposed project has taken place over a number of years. Based on the project's purpose and need and the goal to achieve a context-sensitive solution appropriate for this project and its setting, the following factors were identified to help evaluate alternatives and proposed design criteria. Factors considered in identification of alternatives include:

- Sight distance, including horizontal and vertical alignment, rail spacing and height, line of sight
- Traffic calming considerations
- Accommodation of vehicles loads and navigation of emergency/utility vehicles across and between bridges
- Maintenance requirements
- Aesthetics compared to historic roadway
- Historic alignment of roadway
- Other design criteria/guidelines

Alternatives that were initially considered in relation to the purpose and need for the project and the above factors, but were eliminated from further consideration, are described below.

2.3.1 Alternatives Considered but Eliminated from Further Discussion

2.3.1.1 Replace the ACROW Bridges with Two-Lane Bridges

The standard highway design approach for this roadway's functional classification as a rural minor arterial and amount of daily traffic would be a two-lane bridge. The AASHTO design criteria would include a total roadway width of 38 feet, including two 11-foot travel lanes and 8-foot shoulders (AASHTO 2011). A two-lane bridge was also an alternative recommended to be considered by some members of the public. Therefore, this was an initial action considered in the alternative development process. This alternative would be consistent with the primary project purpose to provide permanent bridges and it also may offer advantages in operating conditions as opposed to one-lane bridges. However, in assessing the alternative's ability to achieve secondary project purposes and its function as a context-sensitive solution, it presented drawbacks in its ability to maintain the historic character of the roadway and was inconsistent with both the HDOT Historic Corridor Roadway Plan and Kaua'i County General Plan to maintain one-lane bridges so as to not alter the roadway character.

Considering the historic context of the roadway and the roadway's operating and safety conditions, the project team determined a design exception was appropriate for this project and a one-lane bridge could perform sufficiently well while addressing many of the needs and issues associated with the existing ACROW structures. The alternative to provide permanent two-lane bridges was therefore dismissed from further evaluation.

2.3.1.2 Replace the ACROW Bridges with One-Lane Bridges on a New *Makai* Alignment

Maintenance of traffic is required for this project due to the lack of available detours. In these circumstances, sometimes an efficient approach to a bridge replacement project is to construct a new bridge on a new alignment so that the existing bridges can remain in place to accommodate traffic during construction. When construction of the new bridge is completed and traffic is transferred to the realigned roadway, the existing bridges can then be removed and the site restored. Depending on site conditions, right-of-way, and presence of utilities, this approach can sometimes reduce the overall construction timeline due to eliminating the need to construct a temporary bypass before beginning construction of the new bridges. This alternative also sometimes presents an opportunity to make more noticeable design improvements to a roadway's alignment.

This alternative was evaluated closely to identify how well it performs against the project objectives and if it should be carried forward for further analysis. The alternative would involve a new alignment that generally follows the same alignment as the existing, but would be shifted approximately 30 feet *makai* of the highway. The same design exceptions of the Action Alternative would be warranted, and the alternative would also operate similarly to the Action Alternative with just a slight drawback due to hydraulic limitations. As described above, cost advantages may be realized from slightly shorter construction durations and eliminating the construction of a temporary bypass, but these would be offset by the disadvantages of needing additional permanent right-of-way from Wainiha Bay Beach Park, the deviation from the historic alignment from a cultural resources perspective, potential increase in permanent aquatic resources impacts, and slight hydraulic disadvantages in the FEMA-regulated floodplain. Because this alternative offered disadvantages over the Action Alternative while not being offset by permanent design advantages or measurable operational improvements, that is, it does not meet the project purpose and need better than the Action Alternative, this alternative was dismissed from further consideration.

2.3.1.3 Replace the ACROW Bridges with One-Lane Bridges on a New *Mauka* Alignment

Similar to the alternative described above, consideration was given to constructing new one-lane bridges on a new alignment to reduce the construction timeline. New one-lane bridges on an alignment *mauka* of the existing highway was briefly considered; however due to private right-of-way constraints and the additional impacts to private landowners, this alternative did not provide sufficient advantages over the Action Alternative to be advanced further.

2.3.1.4 Construction Access Alternatives Considered But Dismissed

Though not considered permanent proposed bridge alternatives, the following alternative components were considered with relation to construction access.

Access Wainiha Bridges via Ocean

Through the public engagement process for this EA, public stakeholders provided recommendations to consider bringing equipment and materials to the project site via boats and/or barges, thereby eliminating the need for temporary bridges at the Waiʻoli, Waipā, and Waikoko bridges. FHWA-CFLHD considered the ability to bring equipment and materials directly to Bridges 1, 2, and 3 through the Wainiha Bay at the mouth of the streams at the bridges. However, the lack of the depth in these areas would require substantial dredging to allow access to accommodate all the project equipment necessary to complete construction. This presents challenges in the Clean Water Act permitting process as practicable alternatives with less aquatic impacts are available.

Historic land development activities in the early 1900s involved the presence of a dock past the Wainiha Bridges towards Hāʻena. This dock was historically used for past developments in the area when boats and barges brought materials in, and is no longer present. Aerial and database review of environmental resources in the marine environment that could be a candidate for potential new barge docking locations or loading/unloading zones identified the presence of sensitive marine waters including Essential Fish Habitat and Hawaiian Monk Seal designated critical habitat. Preliminary coordination with the U.S. Army Corps of Engineers also indicated that this construction approach would be more challenging to permit due to unique environmental and site conditions including more stringent protections for marine waters, and extensive resource surveys would need to be conducted (both in-water and land-based) at areas where boats or barges may access, dock, or transfer materials. This would involve expansive and costly surveys of much greater scope than is warranted for this project.

Fill and activities in open marine waters is less desirable from an environmental standpoint than work in more controlled stream settings because of the more volatile site conditions and the additional challenges isolating and confining in-water work activities. The proposed temporary stream crossings at Waiʻoli, Waipā, and Waikoko have the ability to minimize in-water work in a highly controlled environment where work activities and impacts can be avoided and minimized. This approach was identified as having a less overall

environmental impact. Access to the Wainiha Bridges via the ocean was therefore not carried forward as the proposed construction approach.

Rehabilitate the Wai'oli, Waipā, and Waikoko Bridges to Accommodate Construction Loads

The Wai'oli, Waipā, and Waikoko bridges are original historic bridges that contribute to the NR-listed Kūhiō Highway. As such, these bridges qualify for Section 4(f) protection which requires that the "use" of the resource be approved only if there is no prudent or feasible alternative and that all possible measures to minimize harm are included. The proposed construction of temporary bridges under the Action Alternative at Wai'oli, Waipā, and Waikoko streams does not involve any alteration or changes to these Section 4(f)-protected properties and thus does not qualify as a Section 4(f) use as defined in Section 4(f) regulations. While these bridges do warrant the need for potential future rehabilitation or replacement as they are reaching the end of their service life, extensive engineering and design, and environmental analysis and consultation will be required for long-term improvements. The amount of rehabilitation likely required on a bridge this age may be considered a Section 4(f) use. Further, project implementation to rehabilitate the historic bridges would involve a lengthy evaluation process and would not be completed in a timeframe to support this project to replace the Wainiha temporary bridges.

Temporary bridges and the potential use of prefabricated, modular structures can incorporate potential efficiencies such as longer spans, less in-water work, shallower foundations, and quicker installation than permanently designed structures. Preliminary design has indicated minimal in-water work will be necessary and therefore, aquatic resources impacts will be less than if the multi-span structures were rehabilitated. Improvements on the bridges themselves would also not eliminate the need for roadway closures and, in fact, would likely require more lengthy closures. The alternative to rehabilitate the Wai'oli, Waipā, and Waikoko bridges for construction access to the Wainiha project site was therefore dismissed from further consideration.

2.3.2 Additional Bridge Design Considerations

2.3.2.1 Bridge Width

Due to the application of a design exception in achieving a context-sensitive solution, best engineering judgement was applied to identify the recommended typical section for one-lane bridges appropriate for this specific project. As described above in section 2.2.2, a rail-to-rail width of 14 feet was identified as part of the Action Alternative and is being proposed for this project. In applying best engineering judgement, the following factors and their advantages and disadvantages were considered and led to the identification of the proposed bridge width:

- Design Controlling Criteria, including lane width, shoulder width, and bridge width
- Functionality, including design vehicle maneuverability, shy distance, and level of service
- Potential maintenance considerations
- Roadway use
- Driver perception and expectation
- Historic roadway considerations

2.3.2.2 Rail Type

Bridge rails are one of the most visible aspects of bridges from the driver's perspective and neighboring landowners. Crash-tested bridge rails were closely evaluated, and a structural steel tube rail than can be painted white to offer visual similarities to the historic pre-ACROW bridges was identified. This rail type (Wisconsin Type M) also offers advantages that it can be top-mounted and spaced sufficiently to allow visibility through and above the rails, and the design can be modified in a manner to cantilever off the bridge similar to the historic pre-ACROW structures while still offering adequate crash safety performance.

2.3.2.3 Bridge Deck

The aesthetics of the bridge deck was also considered in preliminary design, and will continue to be considered through final design and construction. Through public engagement, a connection and favorability to the timber decks of the historic pre-ACROW bridges was shared, including both the sound and appearance of timber. Others expressed either a disinterest in the aesthetics of the deck or shared safety and maintenance concerns that existed with the historic pre-ACROW conditions. In consideration of balancing maintenance requirements and safety, while also considering the historic context of the roadway, the Action Alternative proposes concrete decks but designed and finished (through color and surface application and treatment) to offer an appearance of timber. The specific design and aesthetic appearance would continue to be coordinated with the project consulting parties.

2.4 Preliminary Cost and Schedule

In 2015, the proposed project is estimated to cost approximately $20 to $25 million. Construction is anticipated to begin in late 2017 or after all necessary permits and approvals are secured, and is expected to last for approximately two years.

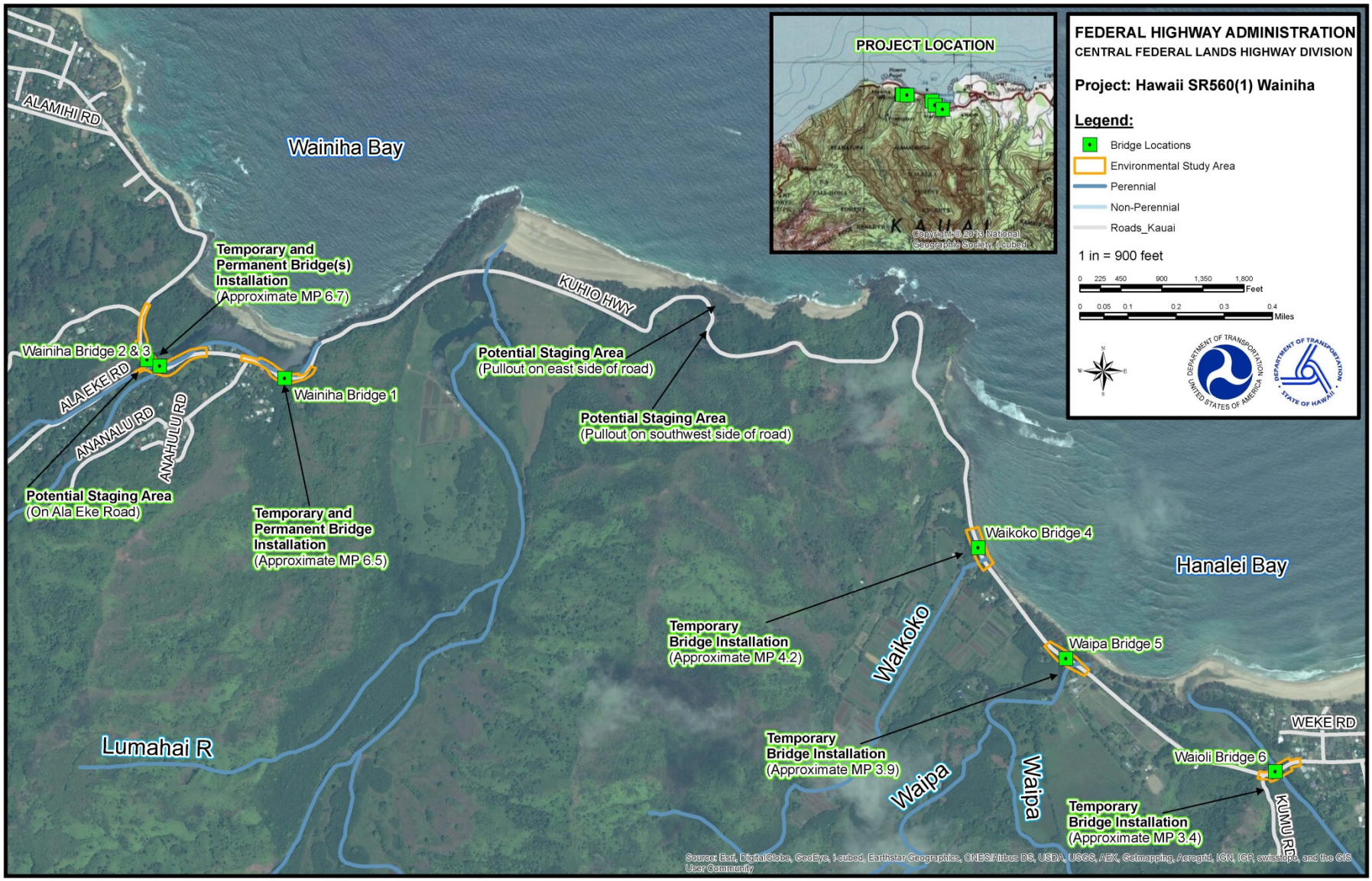

Figure 2-2. Bridge Sites and Potential Staging Areas

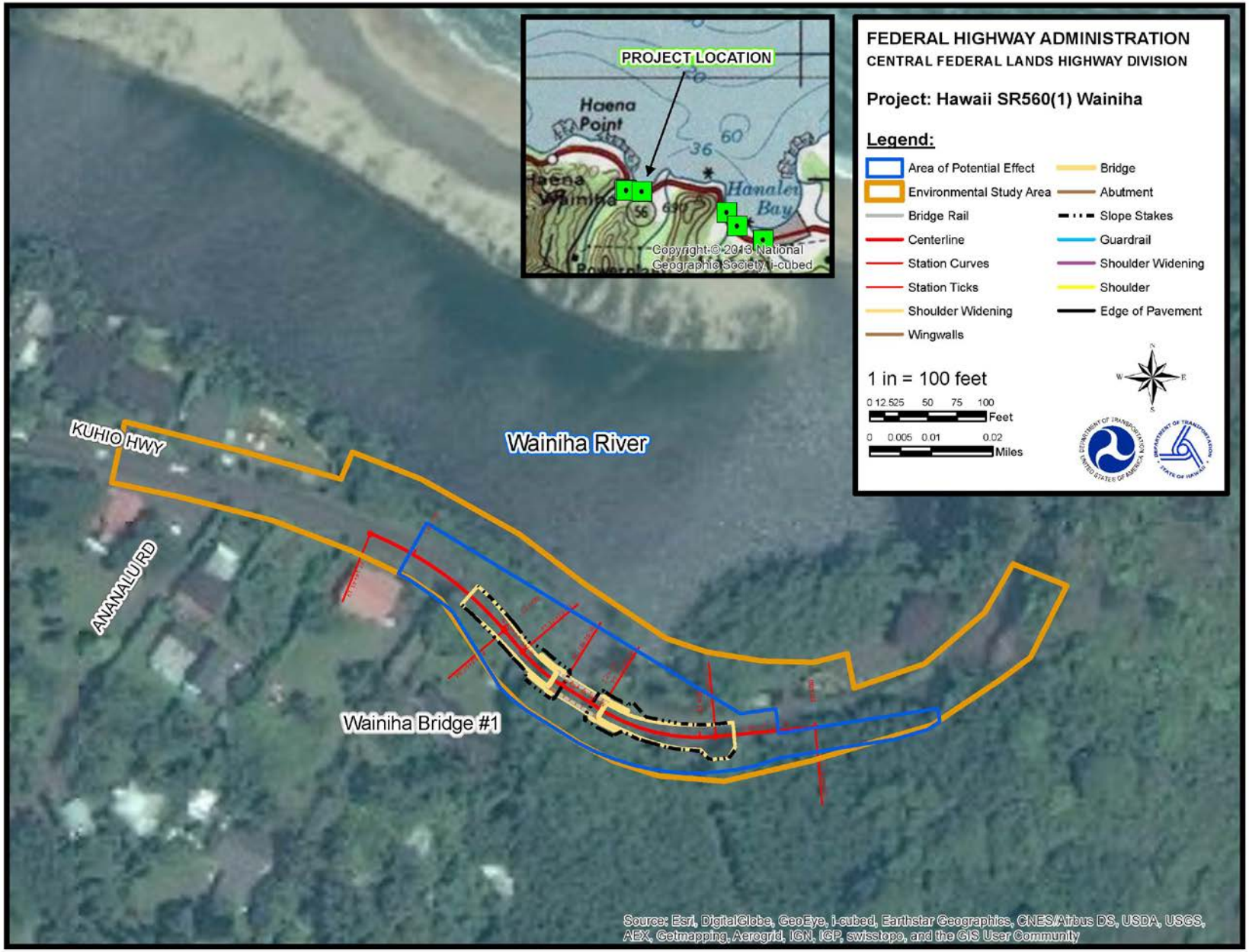

Figure 2-3. Proposed Preliminary Design at Bridge 1

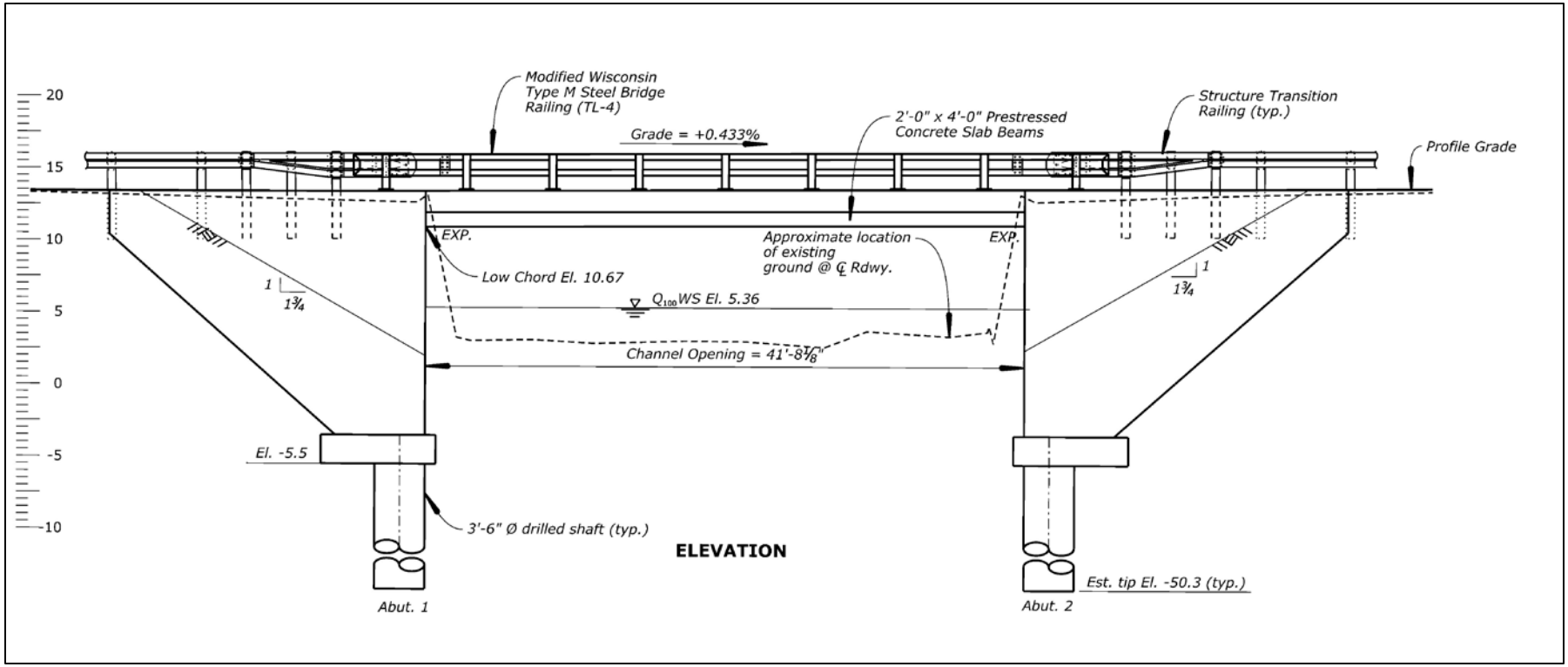

Figure 2-4. Proposed Preliminary Design of Bridge 1, Elevation View

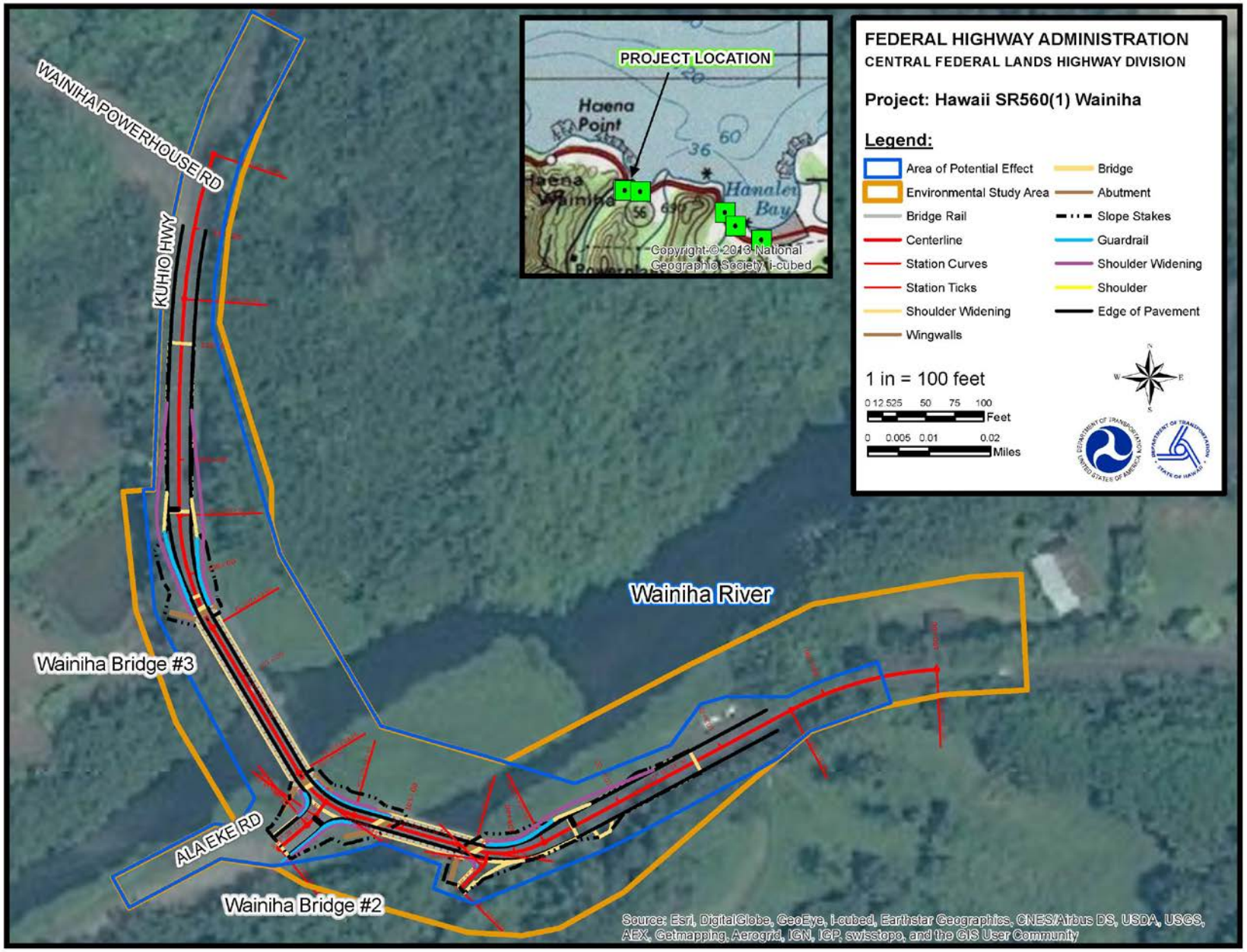

Figure 2-5. Proposed Preliminary Design at Bridges 2 and 3

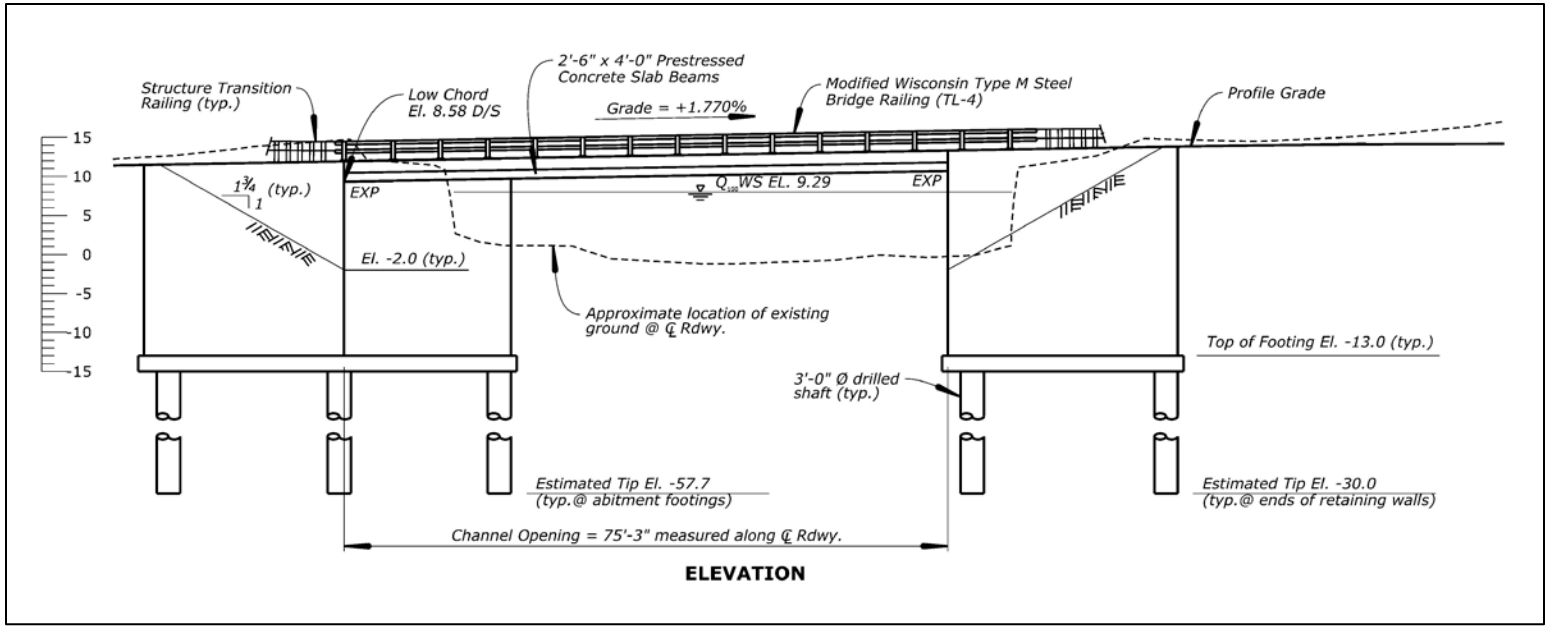

Figure 2-6. Proposed Preliminary Design of Bridge 2, Elevation View

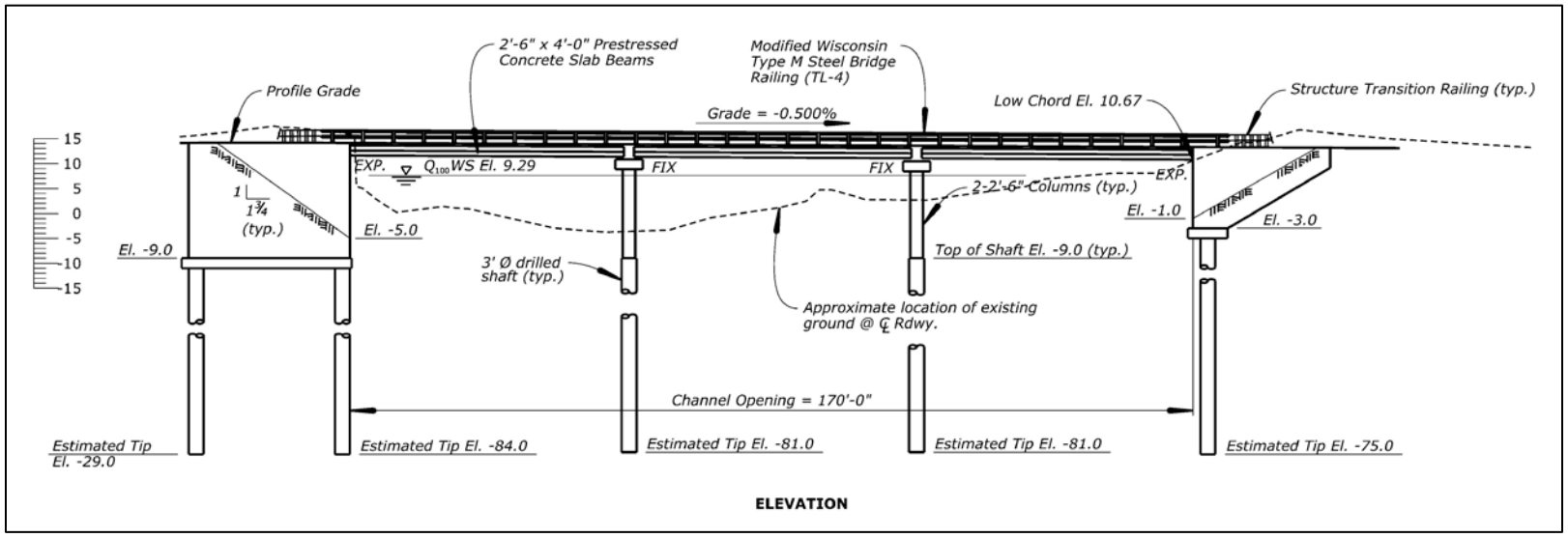

Figure 2-7. Proposed Preliminary Design of Bridge 3, Elevation View

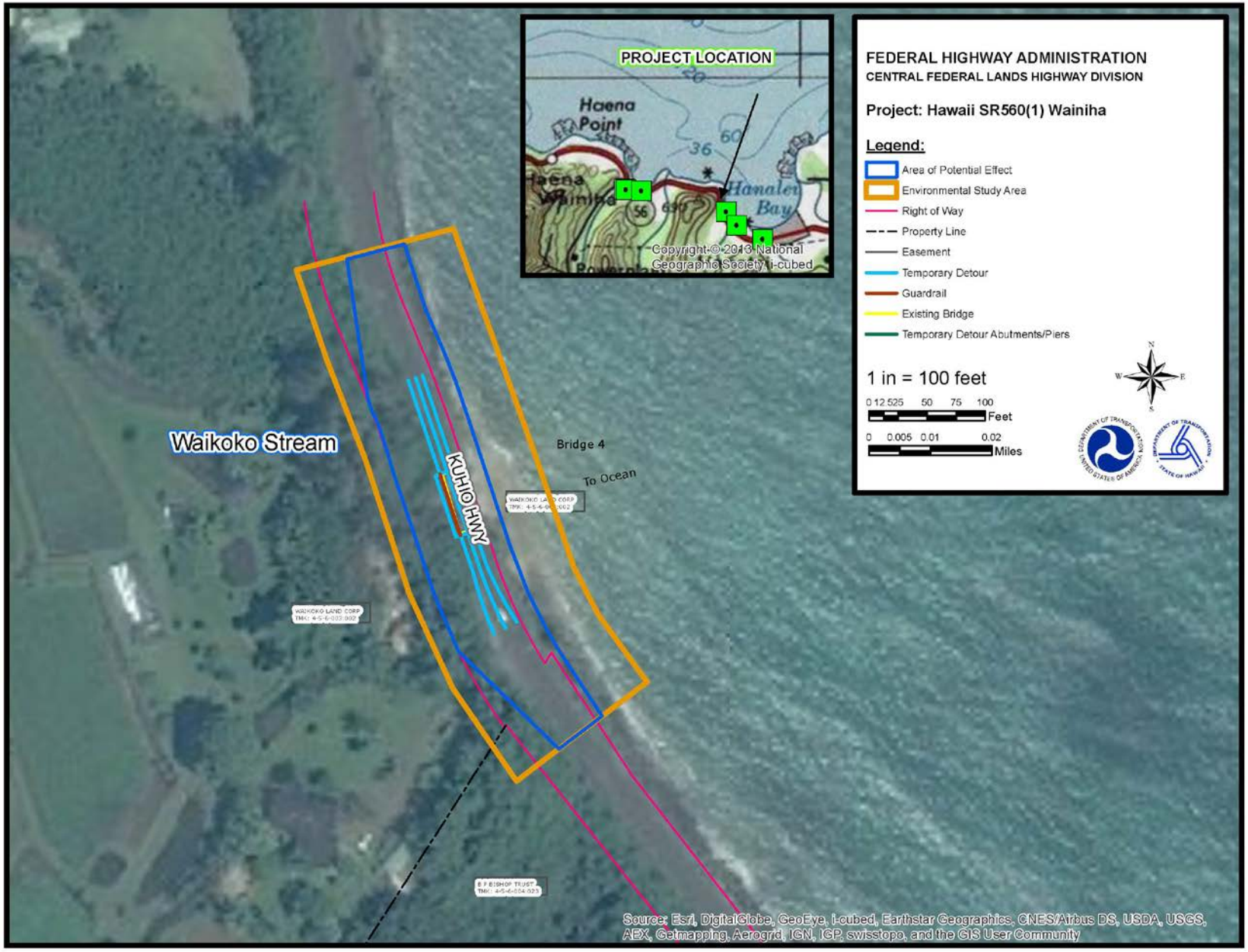

Figure 2-8. Approximate Location of Temporary Bridge at Waikoko Bridge

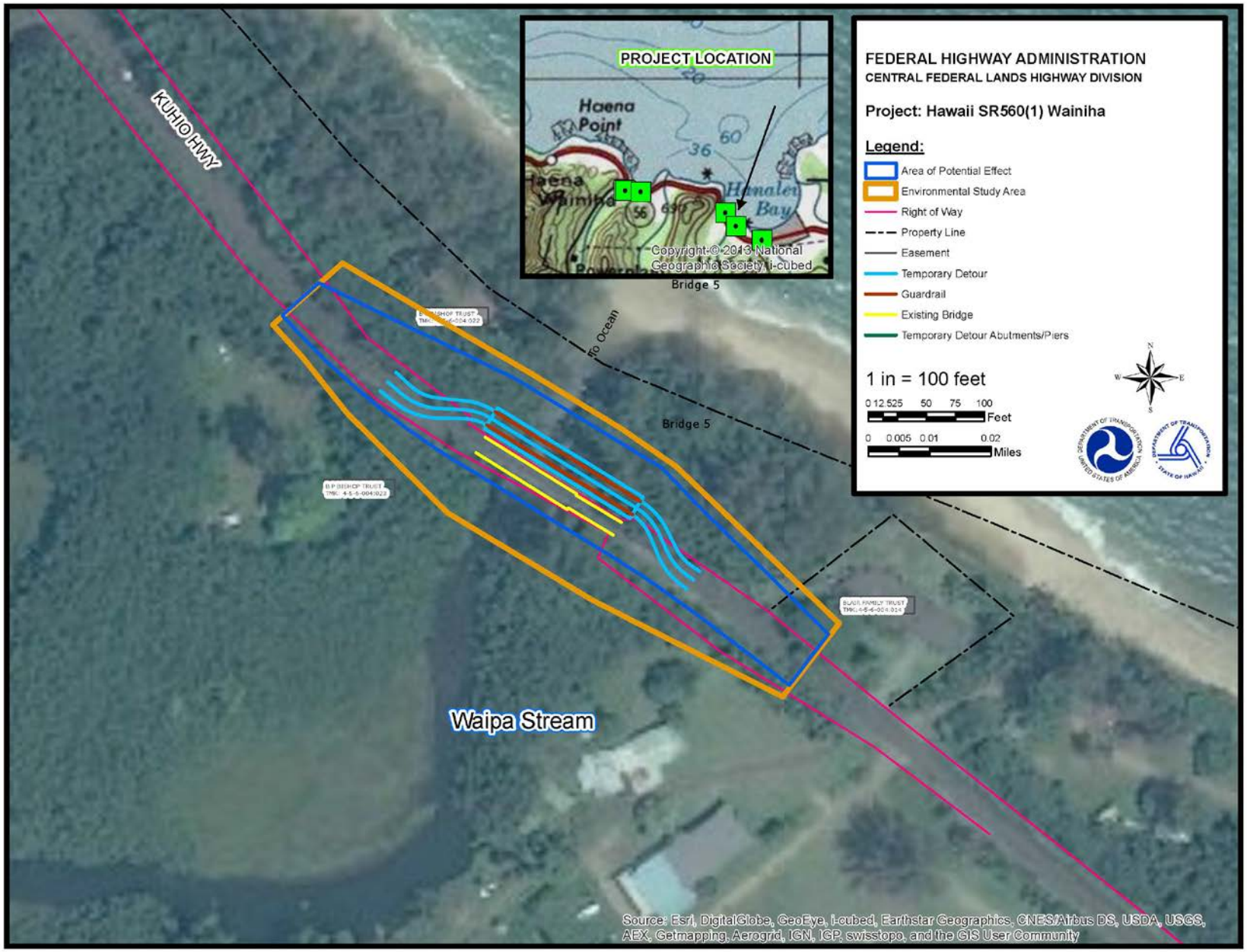

Figure 2-9. Approximate Location of Temporary Bridge at Waipa Bridge

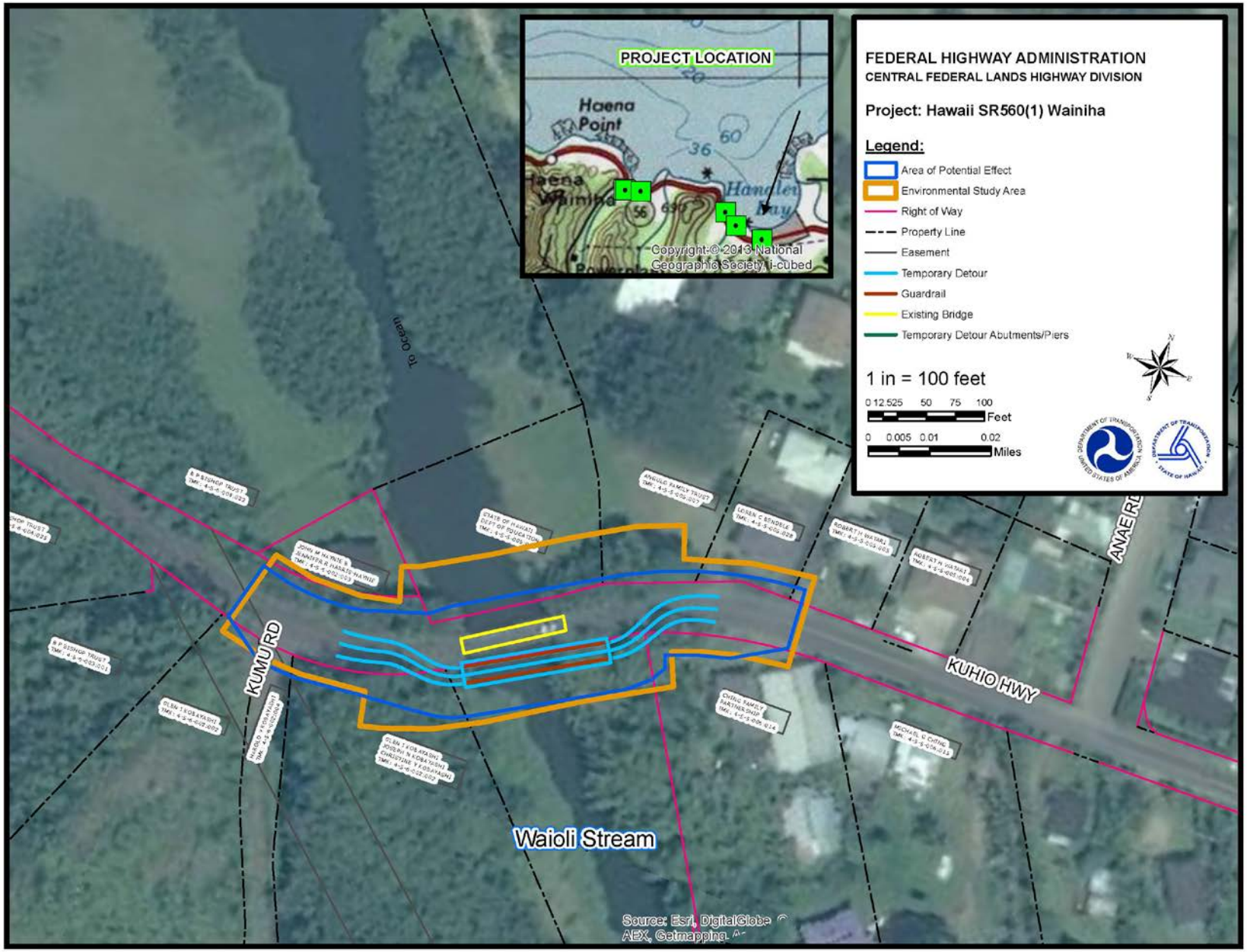

Figure 2-10. Approximate Location of Temporary Bridge at Waioli Bridge

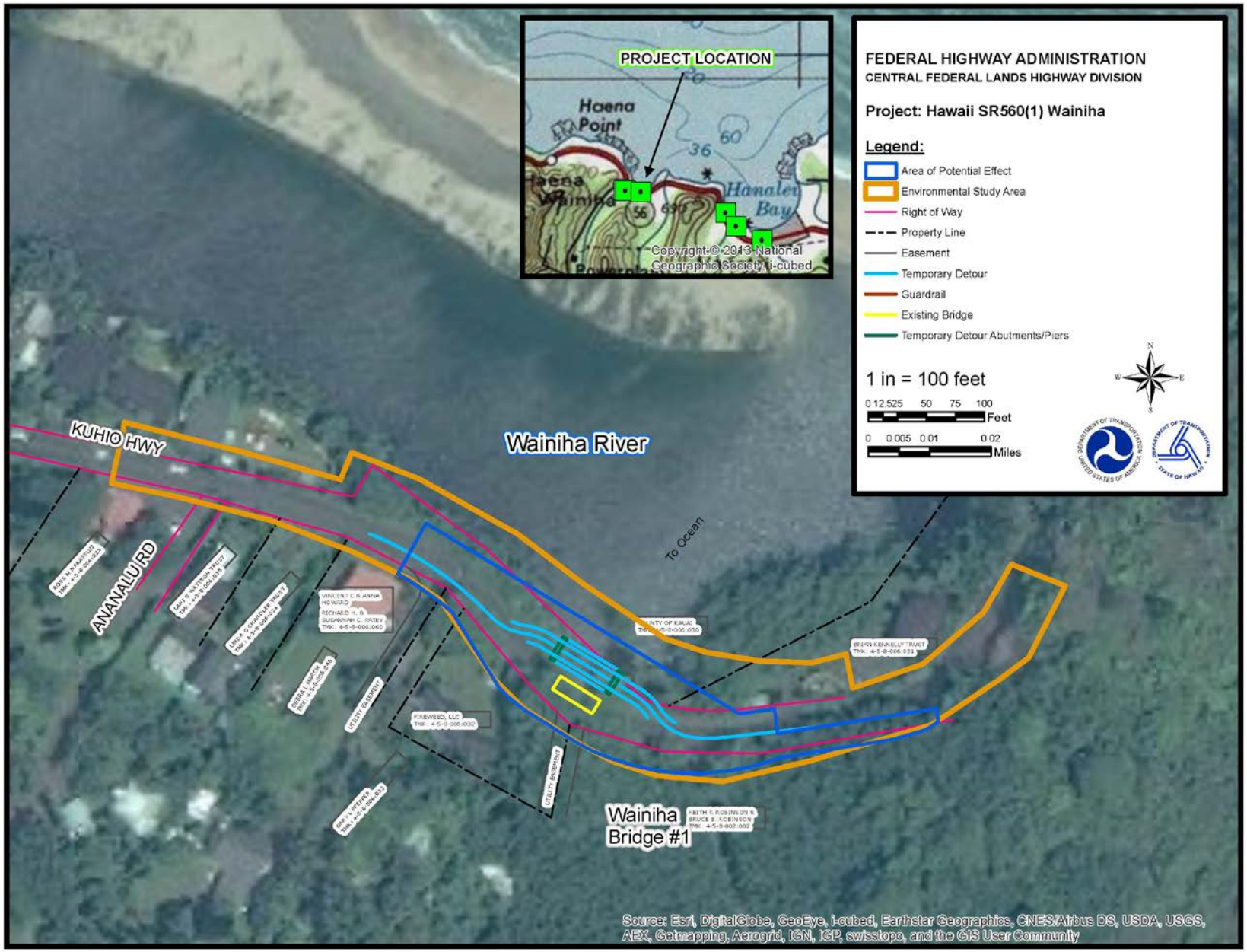

Figure 2-11. Approximate Location of Proposed Temporary Bypass Alignment at Bridge 1

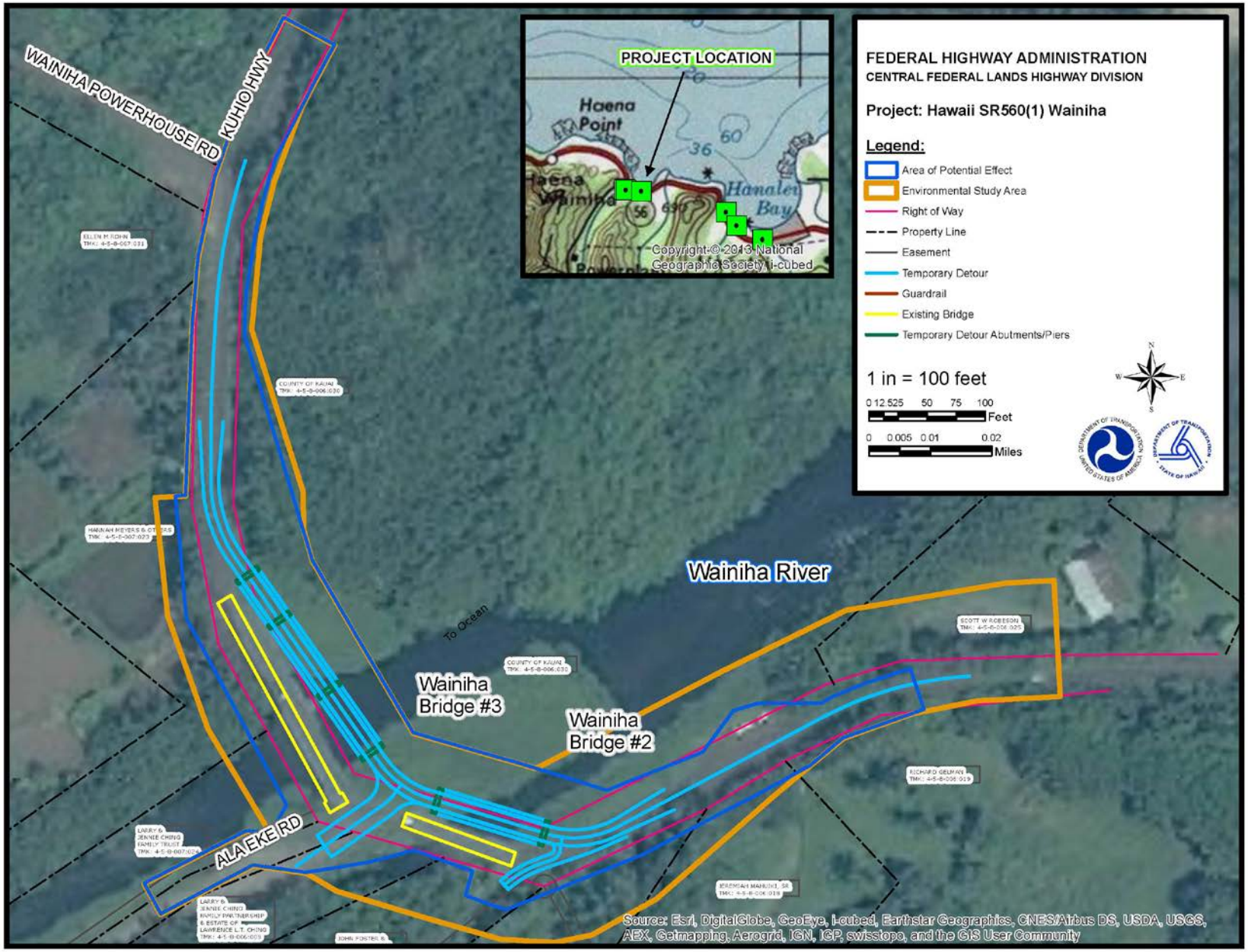

Figure 2-12. Approximate Location of Proposed Temporary Bypass Alignment at Bridges 2 and 3

SECTION 3

Affected Environment, Impacts, and Mitigation

This chapter describes the affected environment, or the existing social, economic, and environmental setting for the project, and the effects that the No Action (or No Build) Alternative and the Action Alternative (Build Alternative) would have on that environment. Avoidance, minimization, and/or mitigation measures are also identified for impacts associated with the Action Alternative.

3.1 Topography, Geology, and Soils

3.1.1 Affected Environment

The island of Kaua'i is the oldest and most eroded of the main Hawaiian Islands. Mount Waialeale, located in the middle of the Island, is one of the wettest places on Earth. As a result, stream erosion and flooding are common, carving deep valleys and canyons and transporting abundant sediment to the coast. The majority of the island is formed by lava flows of the Waimea Canyon Volcanic Series (formed over 2 million years ago). After this main shield-building phase, there was renewed volcanic activity known as the Koloa Volcanic Series, characterized as thick flows of dense basalt extruded from groups of vents aligned in northern-southern trends in various locales. Along streams, drainage ways, and low-lying areas, erosion of the upper Koloa and Waimea Canyon Volcanic Series has deposited alluvial sediments. The project site is mainly underlain by young alluvial and unconsolidated marine deposits (FHWA 2016a).

The Natural Resources Conservation Service identifies the following soil types in the project limits (USDA 1972):

- **Beaches (BS).** This soil occurs as sandy, gravelly, or cobbly areas on all islands. It is washed and rewashed by ocean waves. The beaches consist mainly of light-colored sands derived from coral and seashells. A few of the beaches, however, are dark colored because their sands are from basalt and andesite.
- **Hanalei silty clay, 0 to 2 percent slopes (HnA).** This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the island of Kaua'i and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 20 to 120 inches. The mean annual soil temperature is 74 degrees Fahrenheit (°F). Hanalei soils are geographically associated with Haleiwi, Hihimanu, Mokuleia, and Pearl Harbor soils.
- **Mokuleia Series (Mr) and (Mta):** This series consists of well-drained soils along the coastal plains on the islands of Oahu and Kaua'i. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on Oahu and 50 to 100 inches on Kaua'i. The mean annual soil temperature is 74°F. Mokuleia soils are geographically associated with Hanalei, Jaucas, and Keaau soils.
- **Hanamā'ulu silty clay, 3 to 8 percent slopes (HsB).** This series consists of well-drained soils on stream terraces and steep terrace breaks on the island of Kaua'i. These soils developed in alluvium washed from upland soils. They are nearly level to strongly sloping. Elevations range from 200 to 700 feet. The annual rainfall amounts to 60 to 100 inches. The mean annual soil temperature is 73°F. Hanamaulu soils are geographically associated with Kapaa and Hihimanu soils.

In addition, both potential staging areas are located in previously disturbed upland areas mapped as the following (USDA 1972):

- **Hihimanu silty clay loam, 40 to 70 percent slopes (HMMF).** This series consists of well-drained soils on uplands on the island of Kaua'i. These soils developed in material weathered from basic igneous rock

and colluvium at the base of slopes. They are very steep. Elevations range from 100 to 2,000 feet. The annual rainfall amounts to 70 to 120 inches. The mean annual soil temperature is 69° F. Hihimanu soils are geographically associated with Hanalei and Hanamaulu soils.

The Farmland Protection Policy Act intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

Two soil types that are present in the project area are characterized as prime farmland under certain conditions. The soil, Hanalei silty clay, 0 to 2 percent slopes (HnA), is characterized by the NRCS as prime farmland if protected from flooding or not frequently flooded during the growing season. The Mokuleia fine sandy loam (Mr) is characterized by the NRCS as prime farmland if irrigated. In addition to the NRCS Web Soil Survey that was reviewed, Hawai'i maintains online mapping files of Agricultural Lands of Statewide Importance (ALISH). Presented below in Figure 3-1 are the ALISH in relation to the project area.

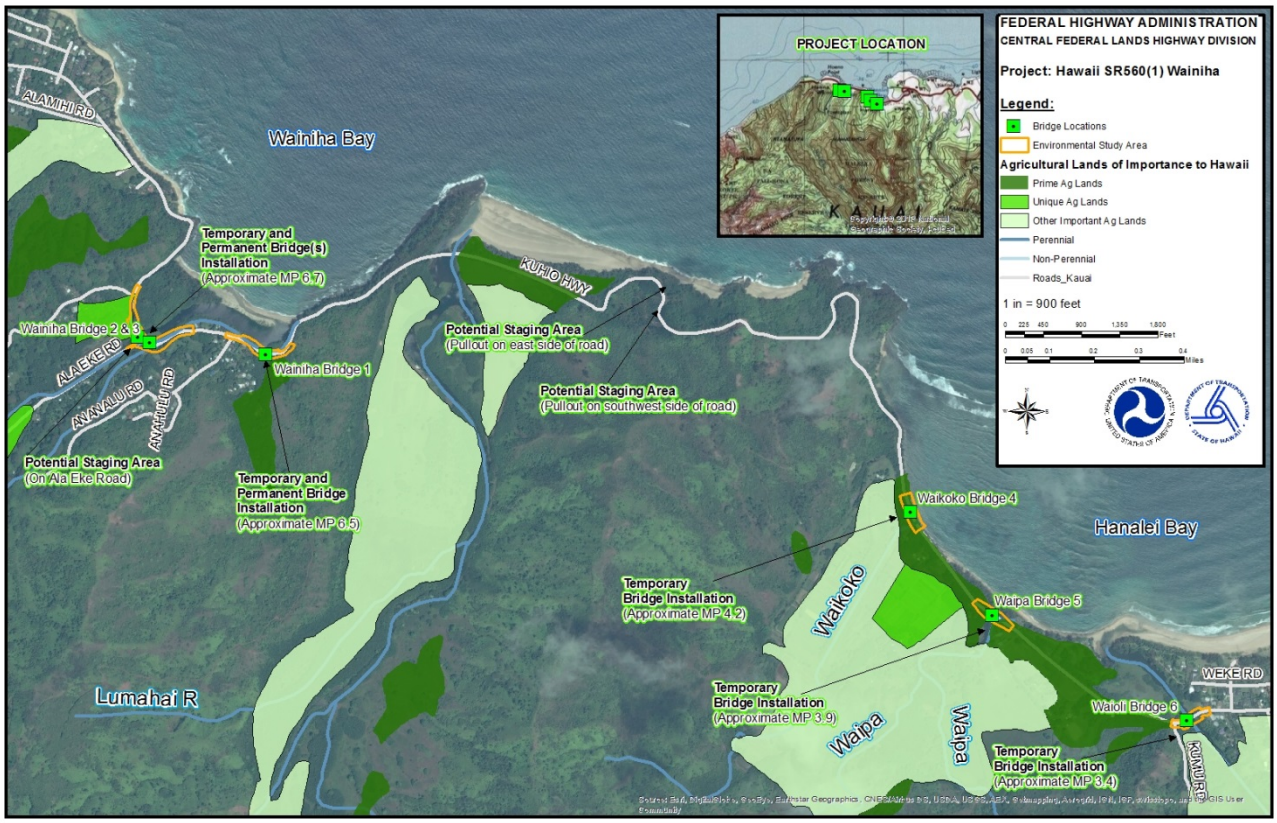

Figure 3-1. Agricultural Lands of Importance to the State of Hawai'i
(Source: Hawai'i GIS Data, 2016)

Preliminary analyses of site conditions and geotechnical evaluations have been performed for the proposed project. Elevations surrounding the proposed project range from sea level to approximately 28 feet above mean sea level (amsl). The site can be characterized into four or five distinct layers characterized for design purposes as a surface fill layer consisting of elastic stiff silts/clays with some sand, cobbles and boulders, underlain by several thin sandy gravelly layers and a 40- to 70-foot- thick alluvial deposit. The alluvium layer consists mainly of loose to medium dense silty sand with lenses of soft to stiff clays and silt matrix with rounded cobbles and boulders approaching three feet in diameter. A 4- to 18-feet thick layer of soft to stiff swamp deposit also exists at varying depths within the alluvium layer.

Geologic hazards that exist in the vicinity of the project area are stream erosion, flash floods, and possible seismic events. These considerations are discussed in section 3.5 of this EA.

3.1.2 Potential Impacts

3.1.2.1 No Action Alternative

The No Action Alternative would not involve replacement of the temporary bridges. As such, no changes or impacts in topography, geology, or soils would occur.

3.1.2.2 Action Alternative

The proposed project is not constrained by geological and topographic site conditions, nor would it affect any unique geological formations. Construction materials include clean gravel and well-graded granular structural fill as backfill for excavations. To address the presence of soft subgrade soils found in geotechnical investigations and the potential for settlement, deep foundations would be installed.

Construction of the bridges, temporary bypasses, and immediate roadway approaches would involve land disturbance that could result in soil erosion. However, the erosion potential is relatively low given the small area of disturbance and the affected soil types, which are characterized in the soil survey as having a relatively low erosion hazard (SSURGO 2001 and USDA 1972). To minimize the potential for construction-related erosion impacts, best management practices (BMPs) would be developed as part of the project's engineering and design in accordance with the Kaua'i County Code for grading, grubbing, and stockpiling (Kaua'i County Code, Chapter 22, Article 7). See section 3.2, Climate and Air Quality, and section 3.3, Water Resources, for a list of applicable BMPs.

The majority of the impacts associated with the project are temporary impacts. These actions do not constitute conversion of farmland or agricultural land as the site would be restored upon project completion. A permanent right-of-way acquisition is subject to FPPA because it may convert land that offers the opportunity to serve as farmland now or in the future to a permanent transportation use. The project would involve permanent acquisition of approximately 0.21 acre of land at Bridges 2 and 3, of which less than 50 percent of this would be within protected soils. FHWA-CFLHD consulted with the NRCS and provided mapping files to the agency for their review of any potential conversion. According to the NRCS, the conversion would be so nominal as to not be considered a conversion for regulatory purposes and no Form AD 1006, Farmland Conversion Impact Rating Form is needed for the project (NRCS 2016).

3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts of the Action Alternative to topography, geology, and soils are less than significant and do not require specific mitigation measures. The project would be designed appropriately for site conditions in accordance with the 2014 AASHTO LRFD Bridge Design Specifications, Seventh Edition (AASHTO 2014).

Avoidance and minimization measures include the implementation of BMPs to minimize the soil erosion potential, and hence minimize potential air quality and water quality impacts. Sections 3.2, Climate and Air Quality and section 3.3, Water Resources provide a summary of these BMPs.

3.2 Climate and Air Quality

3.2.1 Regulatory Setting

The Federal Clean Air Act (CAA), as amended, is the primary federal law that governs air quality while the Hawai'i Air Pollution Control Act is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and Hawai'i Department of Health (HDOH), Clean Air Branch, set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of

2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the CAA also applies.

Conformity

Under the conformity provisions of the CAA, regionally significant and federally funded projects located in designated non-attainment or "maintenance" areas (former nonattainment) must demonstrate conformity to State Implementation and Maintenance Plans. To determine if a project demonstrates conformity to the State Implementation and Maintenance Plans, a project must be included in a Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP), and not cause or contribute any new violation of NAAQS. Conformity with the CAA takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Mobile Source Air Toxics

In addition to the regulated pollutants described above, FHWA also considers Mobile Source Air Toxics (MSATs) in project analyses. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics are the result from engine wear or from impurities in oil or gasoline. Air toxics are pollutants that may pose a potential hazard to human health.

3.2.2 Affected Environment

3.2.2.1 Climate Conditions

Climate in the area of the proposed project is moderated by elevation and prevailing northwest tradewinds. The average maximum daily temperature is approximately 80°F, with an average minimum of 67°F. Mean annual rainfall at the project location is approximately 84.5 inches. Rainfall is typically highest in November and December and lowest in June (Giambelluca et al. 2013).

3.2.2.2 Existing Air Quality Conditions

Kaua'i, like the rest of the state, is in attainment of Federal and State air quality standards.[1] HDOH operates a network of air quality monitoring stations at locations around the state. The only monitoring station on Kaua'i is located approximately 7 miles east-southeast of the project site in the Niumalu subdivision, near Lihue. As reported in the Annual Summary of Air Quality Data for 2013 (HDOH 2014a), the pollutants monitored at the Niumalu station are particulate matter less than 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Carbon monoxide (CO) monitoring was shut down by HDOH as of April 25, 2013. The readings at this location show that criteria pollutant levels were below state and federal ambient air quality standards (see Table 3-1).

Air quality in the project area is currently affected primarily by emissions from mobile sources (traffic on

[1] Exceedances of SO_2 and $PM_{2.5}$ have been reported on Hawai'i Island, but these are associated with the volcano, which is considered a natural, uncontrollable event. Therefore, the State is requesting exclusion of these exceedances from attainment/nonattainment determination (HDOH, 2014c).

Kūhiō Highway). The primary mobile sources of emission are all types of vehicles, which generate pollutants (primarily nitrogen oxide and CO) when traveling or idling on roadways within and adjacent to the project limits.

TABLE 3-1
Island of Kaua'i Air Monitoring Station (Niumalu) Data (2013)

Pollutant	Annual Mean	Federal Air Quality Standard (Primary)	State Air Quality Standard
$PM_{2.5}$ (24-hour)	3.9 µg/m^3	35 µg/m^3	None
NO_2 (Annual)	0.002 ppm	53 ppb	0.04 ppm
SO_2 (1-hour)	0.001 ppm	75 ppb	None
SO_2 (3-hour)	0.001 ppm	0.50 ppm[a.]	0.50 ppm
SO_2 (24-hour)	0.001 ppm	None	0.14 ppm
CO (1-hour)	0.5 ppm[b.]	35 ppm	9 ppm

Notes:

[a.] Federal secondary standard.

[b.] Station (CO) shut down April 25, 2013; incomplete year.

Source: HDOH 2014a

µg/m^3 = micrograms per cubic meter
ppb = parts per billion
ppm = parts per million

3.2.3 Potential Impacts

3.2.3.1 No Action Alternative

The No Build Alternative would result in a continuation of current conditions and maintenance activities and would not involve replacement of the temporary bridges. There would be no measurable changes to air quality from the baseline conditions presented above.

3.2.3.2 Action Alternative

The project is located in an attainment area for all current National Ambient Air Quality Standards (NAAQS). Therefore, conformity requirements do not apply. This project would not result in any changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that can cause an increase in emissions. As such, this project would generate no long-term changes in air quality for CAA criteria pollutants and would not be linked with any special mobile source air toxics (MSAT) concerns.

Short-term, Construction-related Emissions

Construction activities are a source of dust and exhaust emissions that can have impacts on local air quality (i.e., air quality standards for ozone, CO, PM_{10}, and $PM_{2.5}$). Construction of the proposed project is expected to last no more than two years. Therefore, long-term construction-related impacts are not anticipated. However, short-term impacts are anticipated. These include exhaust emissions resulting from use of heavy equipment, as well as minimal land clearing, excavation, and roadway paving activities. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. Emission impacts would be minimized by requiring the contractor to use vehicles that are properly maintained. Nitrogen oxide emissions from diesel engines can be relatively high compared to emissions from gasoline-powered equipment; however, the standard for nitrogen oxide is set on an annual basis and is unlikely to be violated by emissions from short-term use of construction equipment. CO emissions from diesel engines are low and are expected to be negligible compared to vehicular emissions generated on the highway.

Fugitive dust, or airborne particulate matter, can also be generated from exposed soils and construction traffic on unpaved surfaces. However, due to the proposed project involving isolated bridge locations, exposed unpaved areas would be limited. Dust control provisions, as discussed below, would also be incorporated into the project.

3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Overall air quality impacts are expected to be insignificant because the construction period is of limited duration and impacts would be minimized with the implementation of BMPs for dust control and exhaust emissions. Construction activities would incorporate fugitive dust emission control measures in compliance with provisions of HAR Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33 on Fugitive Dust and Kaua'i County Code, Chapter 22, Article 7. Measures that are expected to be used to control airborne emissions include the following:

- Use water, disturbance area limitations, and re-vegetation to minimize dust emissions.
- Stabilize all disturbed areas with erosion control measures.
- Cover open-bodied trucks and trailers whenever hauling material that can be blown away.
- Revegetate disturbed area as soon as practical after construction.
- Stabilize construction entrances to avoid offsite tracking of sediment.
- Maintain equipment in working order.

3.3 Water Resources

This section describes the regulatory setting, availability and quality of water resources including surface water and groundwater within the project area. Surface water includes lakes, streams and drainage ways, and near shore coastal waters. Groundwater includes water present in aquifers (perched, unconfined, confined, or artesian). The region of influence for water resources includes the surface water bodies, streams, and drainage features identified within, or downgradient of, the project area and the underlying aquifer.

3.3.1 Regulatory Setting

Legal protection of Hawai'i's water resources are guided by federal statutes and state statues and rules. The three primary federal laws include: the Clean Water Act (CWA), the Coastal Zone Act Reauthorization Amendments (CZARA), and the Safe Drinking Water Act (SDWA).

3.3.1.1 Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[2] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. The Department of Health, Clean Water Branch (DOH-

[2] A point source is any discrete conveyance such as a pipe or a man-made ditch.

CWB) administers this permitting program in Hawai'i. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

- Section 404 establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE, with oversight by the United States Environmental Protection Agency (U.S. EPA).

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

Waters of the United States

The USACE derives its regulatory authority over potential Waters of the United States (WUS) from two federal laws: 1) Section 10 of the Rivers and Harbors Act (RHA) of 1899 and 2) Section 404 of the Clean Water Act (CWA) of 1972. WUS are defined in 33 CFR 328 and 40 CFR 230.3

Section 10 of the Rivers and Harbors Act of 1899 prevents unauthorized obstruction or alteration of navigable WUS. Navigable waters are defined as "subject to the ebb and flow of the tide and/or presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR 322.2(a)). A Section 10 permit is required for non-fill discharging activities that would place any structure below, within, or over navigable WUS, or would involve excavation/dredging or deposition of material or any obstruction or alteration in navigable WUS.

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the CWA (33 USC 1344) is the primary law regulating wetlands and surface waters. The CWA defines WUS subject to agency jurisdiction in 40 CFR 230.3. Under Section 404 of the CWA, dredged and fill material may not be discharged into jurisdictional WUS (including wetlands) without a permit. Wetlands are a subset of jurisdictional WUS and are jointly defined by the USACE and the U.S. Environmental Protection Agency (40 CFR 230.3) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations [CFR] 40 Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict

permitting activities that violate water quality or toxic effluent[3] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements (33 CFR 320.4).

3.3.1.2 Federal Requirements: Safe Drinking Water Act

The Safe Drinking Water Act, which was originally passed in 1974, protects public health by regulating the nation's drinking water supply. It is administered by the EPA and implemented by the DOH Safe Drinking Water Branch (SDWB). This branch is responsible for protecting the State's drinking water resources, including both surface and groundwater sources, and ensures that public water systems meet federal and state health-related standards for drinking water. The DOH's Wastewater Branch (WWB) is also responsible for protecting drinking water and public health by ensuring that the use and disposal of wastewater does not contaminate water sources.

3.3.1.3 Federal Requirements: Executive Order 11990

Executive Order (EO) 11990 for the Protection of Wetlands also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as FHWA cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

3.3.1.4 State Requirements:

The state statutes and rules governing water quality are captured in the Hawai'i Revised Statutes (HRS) and the Hawai'i Administrative Rules (HAR).

Water quality management in Hawai'i is guided by the State Water Code (HRS Chapter 174C) and the Hawai'i Water Plan. The Hawai'i Water Plan serves as a framework for comprehensive water resource planning to address the State's water quantity and quality issues. Specifically, it sets forth an integrated and coordinated approach to managing the State's waters and consists of plans prepared and implemented by the State DOH, the Department of Land and Natural Resources (DLNR), the Department of Agriculture (HDOA), and the four counties of Hawai'i. These agencies and their respective plans address the State's water protection policies, water quality, water needs, and sustainable water use. DLNR's Water Resource Protection Plan and DOH's Water Quality Plan provide the overall legal and policy framework that guides the development, conservation, and use of water resources. DLNR's State Water Projects Plan and HDOA's Agricultural Water Use and Development Plan provide guidance for the State's agricultural water needs and development. The information from these plans is integrated into County Water Use and Development Plans, which set forth the broad allocation of water use within each county (DOH-CWB 2015).

The DOH Environmental Management Division (EMD) establishes the State's water quality standards and is the lead agency responsible for protecting the State's surface and groundwater quality. The EMD administers the State's surface water and groundwater quality assessment, management, permitting, and enforcement programs through the Clean Water Branch (CWB), the Safe Drinking Water Branch (SDWB), and the Wastewater Branch (WWB) (DOH-CWB 2015).

The DOH-CWB is responsible for implementing the Surface Water Quality Management Program for recreational and ecosystem protection. This is accomplished through a coordinated approach that includes

[3] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

water quality monitoring and assessment, engineering and permitting, water quality violation enforcement, and polluted runoff control management.

Pursuant to the CWA and HRS Chapter 342D, HAR Chapter 11-54 (Water Quality Standards) establishes Hawai'i's water quality standards, including limits for conventional and toxic pollutants. Chapter 11-54 also classifies the State's water bodies and prohibits unauthorized discharges from both point source and nonpoint sources in inland and marine waters. HAR Chapter 11-55 (Water Pollution Control) provides for the prevention, abatement, and control of new and existing water pollution, primarily through permitting and permit compliance. Chapters 11-54 and 11-55 are administered by the CWB and are reviewed and amended every three years or as needed (DOH-CWB 2015).

Sections 305(b) and 303(d) of the CWA drive Hawai'i's surface water quality efforts. Under Section 305(b), the State is required to assess, characterize, and report the quality of its surface waters every two years. Under Section 303(d), the State identifies impaired waters and develops Total Maximum Daily Loads (TMDLs) to address these impairments. Impaired waters do not meet the State's numeric water quality criteria, which are governed by HAR Chapter 11-54. The State of Hawai'i Water Quality Monitoring and Assessment Report, known as the Integrated Report, addresses 305(b) and 303(d) requirements and is submitted to the U.S. EPA and U.S. Congress by the Department of Health (DOH) Clean Water Branch (CWB) every two years (DOH-CWB 2015).

The DOH CWB Monitoring and Analysis Section is responsible for monitoring State surface waters, updating water quality standards, conducting assessments for the 303(d) list of impaired waters and the 305(b) report, and developing total maximum daily loads (TMDLs).

National Pollutant Discharge Elimination System (NPDES) Program

The Hawai'i legislature enacted HRS Chapter 342D (Water Pollution) and Chapter 342E (Nonpoint Source Pollution Management and Control) to address point source and Non-Point Source (NPS) water pollution in the State. HRS Chapter 342D is Hawai'i's equivalent to the CWA and states that "[n]o person, including any public body, shall discharge any water pollutant to state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the director [of the DOH]." Under Chapter 342D, the DOH has the authority to administer, enforce, and carry out all laws, rules, and programs relating to both point source and NPS pollution (DOH-CWB 2015).

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges including:

A. A discharge with respect to which a permit has been issued under this section before February 4, 1987.
B. A discharge associated with industrial activity.
C. A discharge from a municipal separate storm sewer system serving a population of 250,000 or more.
D. A discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000.
E. A discharge for which the Administrator or the State, as the case may be, determines that the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." Currently in O'ahu and Maui counties, a portion of urban runoff is controlled through NPDES MS4 permits. MS4 permits require these counties to develop and

implement stormwater management program plans, which include pollution prevention measures. The Coastal Nonpoint Pollution Control Program (CNPCP) also devotes several management measures to the prevention and reduction of pollution generated by development and maintenance of roads, highways, bridges, and facilities in urban areas (DOH-CWB 2015).

Construction General Permit

The DOH-CWB amended HAR, Chapter 11-55 and readopted the NPDES General Permits in HAR, Chapter 11-55 (Appendices B through L). These NPDES General Permits, became effective on December 6, 2013. The NPDES General Permit in Appendices B through L cover numerous discharges of stormwater from various construction and operational activities., The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the DOH-CWB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

FHWA-CFLHD, as the agency responsible for construction management oversight for this project, is responsible for obtaining the NPDES permit and for signing certification statements (when necessary). FHWA-CFLHD is also responsible for ensuring that all permit conditions are included in the construction contract and fully implemented in the field.

Section 401 Water Quality Certification Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the DOH-CWB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the DOH-CWB may have specific concerns with discharges associated with a project. As a result, the DOH-CWB may issue a set of requirements that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. These requirements can be issued to address both permanent and temporary discharges associated with a project.

3.3.2 Affected Environment

The following discussion summarizes the evaluation of the existing water resources within the project area including surface waters (which includes waters defined as “Waters of the U.S”, “wetlands” and there associated riparian zones), Ground Water, Floodplains, and Coastal Water(s) and the potential effects to these resources that could occur with implementation of either the No Action Alternative, or the Action Alternative. Additional information on the assessment of these resources is available in the *Determination and Delineation of Wetlands and Other Waters of the U.S. for the Wainiha Bridges Project* (SWCA 2015a).

Water resources evaluated in this document include: 1) Surface waters including: a)wetlands, as defined by and under jurisdiction of the USACE under the CWA or the Rivers and Harbors Act or USCG; and b) other WUS as also defined by the USACE, including rivers, streams, the pacific ocean 2) Groundwater and Aquifers 3) Floodplains and Floodways, as defined and regulated by EO 11988, the NFIA, and FDPA; and 4) Coastal Waters, as defined and regulated by the CZMA and the CZARA.

3.3.2.1 Surface Waters

The generation of surface water typically begins in the mountains as rainfall. As surface water precedes downgradient it collects in streams and gulches. A portion infiltrates through the ground surface and streambeds, recharging the underlying aquifer. Potential issues arise if the course or carrying capacity of gulches and streams is changed, as this can cause flooding or scour damage and degradation of downstream water quality.

The proposed action includes the replacement of 3 temporary bridges over the Wainiha River. The temporary bridges would be moved and placed next to their existing location during construction to accommodate construction and public access across the Wainiha River. In addition, three temporary crossings over the Waiʻoli, Waipā, Waikoko streams would also be needed to accommodate construction equipment access to the project area.

Before field surveys were conducted the aerial imagery, topographic maps, National Wetlands Inventory (NWI) data from the USFWS Wetlands Mapper database, National Hydrographic Datum, and soil data from the Natural Resource Conservation Service (NRCS) Web Soil Survey were reviewed to determine potentially jurisdictional watercourses and wetlands within the survey area.

Biologists with SWCA Environmental Consultants (SWCA) were retained to conduct fieldwork as needed to delineate the boundaries of WUS within the survey area. The field survey was completed between September 30 and October 2, 2014. The presence of non-wetland WUS, including ephemeral, intermittent, and perennial streams, were delineated based on the high tide line or ordinary high water mark (OHWM). SWCA field personnel delineated the boundaries of tidal non-wetland waters by recording the location of the high tide line and OHWM. The OHWM is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (regulatory guidance letter 05-05; 33 CFR 328). The high tide line is defined as the intersection of the land with the water's surface at the maximum height reached by a rising tide (33 CFR 328). The high tide line was determined in the field based on physical characteristics or indicators. Examples of indicators include line of oil or scum, deposit of fine shell or debris, vegetation lines, tide gauges, topography, or other suitable means.

The presence of wetlands as prescribed by the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE 1987 Manual; USACE 1987), as amended were also delineated. The USACE 1987 Manual outlines the technical guidelines and methods for identifying and delineating wetlands potentially subject to Section 404 of the CWA. This manual is supplemented by the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaiʻi and Pacific Islands Region* (USACE 2012). Based on these documents, jurisdictional wetlands are identified using the following three criteria:

- Hydric soils—soils permanently or seasonally saturated by water
- Hydrophytic vegetation—plants adapted to life in water or waterlogged conditions
- Wetland hydrology—areas periodically inundated or have soils saturated to the surface at some time during the growing season

Based on the Cowardin classification system (Cowardin 1998), the wetlands within the project area are considered palustrine emergent (PEM) or palustrine forested (PFO). The survey area for delineating surface waters is located on the north side of the Island of Kauaʻi between Hanalei and Wainiha along Kūhiō Highway (Route 560) (see Figure 1-1). The survey area comprised five non-contiguous survey areas: Waiʻoli, Waipā, Waikoko, Wainiha Bridge 1, and Wainiha Bridges 2 & 3 (as described below). In all, the whole survey area covered approximately 9.24 acres (3.74 ha), as outlined in Table 3-2 below. The mapped wetlands can be seen in the SWCA report included in Appendix C of this EA.

TABLE 3-2
Acreage of Bridge Survey Areas

Bridge Survey Area	Acres
Waiʻoli	1.26
Waipā	1.45
Waikoko	1.46
Wainiha 1	1.60
Wainiha 2 & 3	3.47
Total	**9.24**

For the Islands of Hawaiʻi, the stream reach classification system (Parham et al. 2008a) was developed by Bishop Museum researchers in collaboration with Hawaiʻi's Division of Aquatic Resources (DAR) biologists to provide a general classification of stream reaches that could be applied systematically to all streams on all islands. In total, eight stream types have been designated for Hawaiʻi on the basis of size, shape, bay development, and slope. The reach types are based on elevation and the presence of different sized barriers (waterfalls) in the stream.

- Estuary: all stream segments between the coast line and 1 m. elevation.
- Lower Reach: stream segments between 1 and 20 m. elevation and below any barrier of approximately 10 m. high.
- Middle Reach: stream segments greater than 20 m elevation or above the first 10 m barrier and less than 200 m. elevation or below the first 20 m high barrier.
- Upper Reach: stream segments greater than 200 m elevation or above the first 20 m barrier and less than 750 m. elevation.
- Headwaters: stream segments greater than 750 m. elevation.

Mean annual rainfall in the survey area is approximately 89.5 inches (2,275 millimeters [mm]). Rainfall is typically highest in March and lowest in June (Giambelluca et al. 2013). The closest rainfall gauge to the survey area (Wainiha [WNHH1]) experienced 7.78 inches (198 mm) of rain for 2014 through the end of October, which is slightly above average (National Oceanic and Atmospheric Administration (NOAA)/National Weather Service 2014). Waters passing under Waikoko, Waipā, and Waiʻoli Bridges flow into Hanalei Bay, whereas waters passing under Wainiha 1, 2, & 3 flow into Wainiha Bay. Below is a summary of the surface waters that occur in each of the five survey areas.

Wainiha River (21014)

The Wainiha River watershed (DAR Watershed Code: 21014) watershed is located on the windward North Coast of the Island of Kauaʻi (Figure 3-2). The river flows from the northern slope of Mount Waiʻaleʻale. The Hawaiian meaning of the river's name is "unfriendly water". The area of the watershed is 23.4 square miles (60.6 square km), with maximum elevation of 5,118 ft. The watershed is approximately 10.7 miles long and 2.5 miles wide at its widest point. The upper reaches of the watershed is dominated by mixed forest and is located within the Halele'a Forest Reserve. The watershed's DAR cluster code is 6, meaning that the watershed is large, narrow, and steep in the upper watershed. The percent of the watershed in the different land use districts is as follows: 0% agricultural, 97.9% conservation, 1.5% rural, and 0.5 % urban (Parham et al., 2008b). Water conveyed by the Wainiha River empties into Wainiha Bay, approximately 0.10 miles (Bridge 1) and 0.40 miles (Bridges 2 and 3) downstream from the project area.

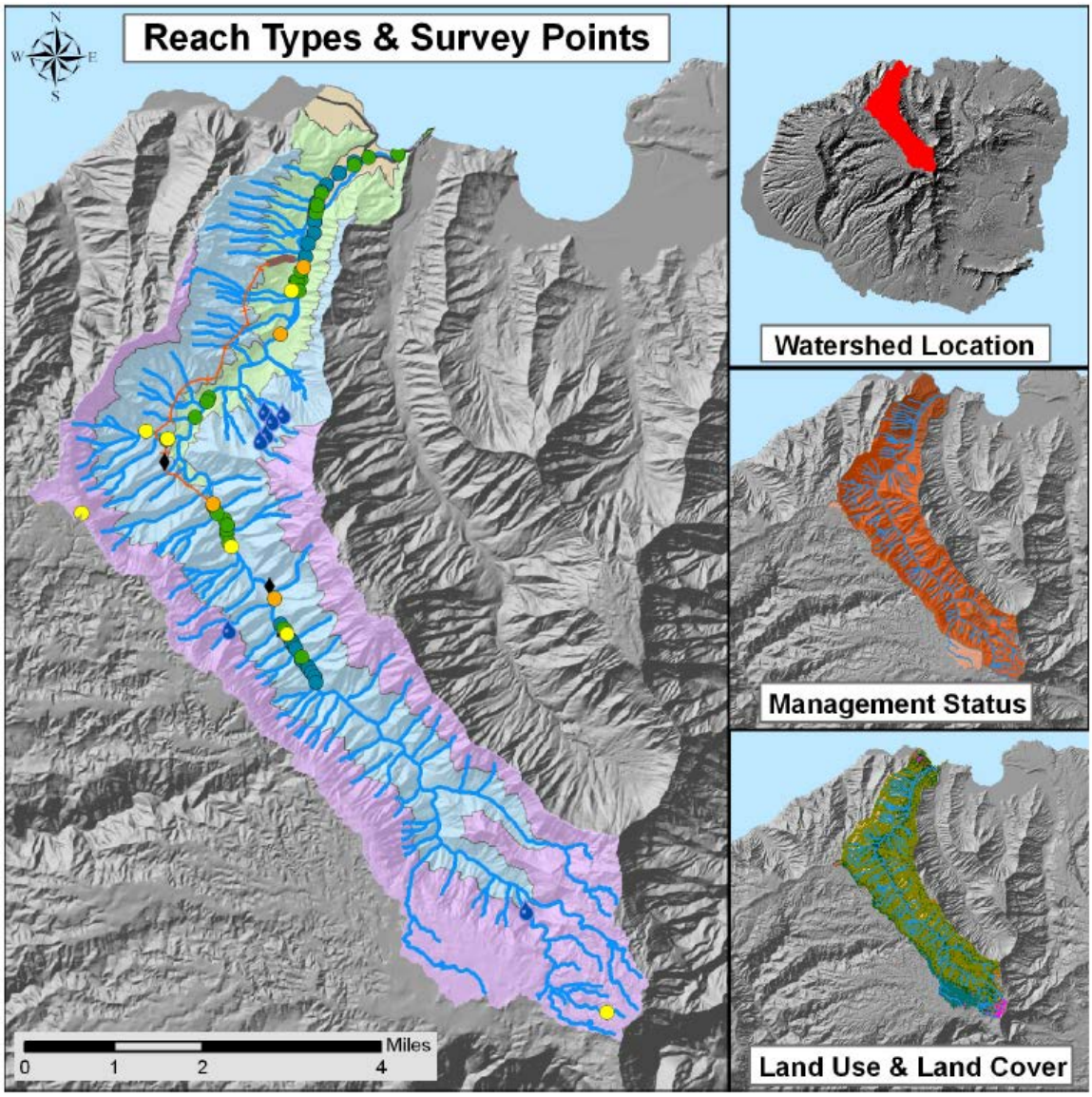

Figure 3-2. Wainiha Watershed (21014)
(Source: Parham et al. 2008b)

The Wainiha River is a perennial stream (Terminal Stream Order 4) that is designated as outstanding in the 1990 Hawai'i Stream Assessment Rank. The total stream length is 89.4 miles (143.8 km) with 25.9 miles occurring in the headwaters, 53.9 miles occurring in the upper reach type, 17.2 miles occurring in the middle reach type, 3 miles occurring in the lower reach type and 0 miles in the estuary reach type.

A diversion used to generate hydropower is found on the Wainiha River at about 213 m elevation. The diversion constructed around 1920, depletes 100 % of natural streamflow 80 % of the time, sending water through a system of ditches and flumes to a powerplant site several miles lower in the valley (Kido 1996).

Water Quality

The DOH CWB prepared the 2014 State of Hawai'i Water Quality Monitoring and Assessment Report (DOH-CWB 2014) to report the status of assessed water bodies (National Water Quality Inventory Reporting requirements (305(b)) and list of Impairment waters (303(d)) for inland and marine waters to congress. A Section 303(d) listed water body means that it is impaired by at least one pollutant, which affects recreation or the protection and propagation of fish, shellfish and wildlife. State waters are monitored for bacterial indicators, nutrients and biogeochemical parameters to determine overall recreational and ecosystem

health. According to 2014 the DOH-CWB report the Wainiha River is in attainment for all assessed criteria pollutants (Total Nitrogen, Total Phosphorus, Nitrate (NO_3) and Nitrite (NO_2), Turbidity, and Total Suspended Solids (TSS) for both the wet and dry season. An assessment of Enterococci (E.coli) has not been completed for this water body.

Wainiha Bridge 1

The Wainiha Bridge 1 survey area covered approximately 1.60 acres (0.65 ha). The bridge itself spans an ephemeral drainage or backwater of the estuary. The survey area consists of an estuary on the *makai* side of the bridge and undeveloped vegetated and residential parcels on the *mauka* side of the bridge. The Wainiha General Store is just northwest of the survey area. The entire area was accessible during field surveys.

Elevations in the survey area range from sea level to roughly 26 feet (7.9 m) above sea level. The NRCS identifies four soil types in the survey area. Hanamā‘ulu silty clay, Mokuleia fine sandy loam, beaches, and rough broken land (USDA 1972; NRCS 2013). None of the soil types are listed as a hydric soil (NRCS 2012).

The NWI program does not identify any wetlands or aquatic habitats in the Wainiha Bridge 1 survey area (USFWS 2014a). Adjacent to the survey area is an estuarine resource (Estuarine, Subtidal, Unconsolidated Bottom, Subtidal [E1UBL]). The State of Hawai‘i and U.S. Geological Survey (USGS) also do not show any water features in the Wainiha Bridge 1 survey area.

The vegetation types in the Wainiha Bridge 1 survey area are ruderal vegetation, mixed non-native forest, hau thicket (*Hibiscus tiliaceus*) , and ornamental landscaping. The hau thicket and mixed non-native forest are present on the *mauka* side of the bridge immediately adjacent to the stream. The mixed non-native forest is characterized by large, spreading false kamani trees (*Terminalia catappa*), with only a few scattered seedlings and laua‘e fern (*Phymatosorus grossus*) in the understory. The ruderal vegetation occurs in and along the highway right-of-way and in heavily disturbed areas. The water’s edge is dominated by umbrella sedge (*Cyperus involucratus*) and California grass (*Urochloa mutica*).

On the flatter, drier areas, this vegetation type is largely composed of elephant grass (*Cenchrus purpureus*), wedelia (*Sphagneticola trilobata*), Guinea grass(*Urochloa maxima*), dallis grass(*Paspalum dilatatum*) , and Leadtree (*Koa haole*). Perrenial soybean (*Neonotonia wightii*), maunaloa vine (*Canavalia cathartica*), and moon flower (*Ipomoea alba*) are climbing in trees and over shrubs. Ornamental trees and shrubs are planted adjacent to houses, including ti (*Cordyline fruticosa*), hibiscus (*Hibiscus spp*.), Turk's cap (Malvaviscus penduliflorus), and beefsteak plant (*Acalypha wilkesiana*). Mowed lawns of wide-leaved carpetgrass (*Axonopus compressus*) and Bermuda grass (*Cynodon dactylon*) are interspersed with weedy grasses and low-growing herbaceous species.

Approximately 0.37 acre (0.15 ha) of estuarine non-wetland WUS (Estuarine, Subtidal [E1]) and 0.05 acre (0.02 ha) of riverine non-wetland WUS (Riverine, Lower Perennial [R2]) were delineated in the Wainiha Bridge 1 survey area. This segment of Wainiha Stream was determined to be tidally influenced because of its proximity to the ocean and the salinity observed during SWCA’s fieldwork. The high tide line was determined using topography, as well as the vegetation line. No wetlands were identified within the Wainiha Bridge 1 survey area.

TABLE 3-3
Potential Waters of the U.S. Delineated in the Wainiha Bridge 1 Survey Area

WUS ID	Wetland Classification Code	Acres
08	E1UBL	0.37
09	R2	0.05
Total		**0.42**

Wainiha Bridges 2 and 3

The Wainiha Bridges 2 & 3 survey area is adjacent to Wainiha Bay and spans the Wainiha Stream. The survey area covers approximately 3.47 acres (1.40 ha). The existing bridges are approximately 300 feet (91.4 m) long and 15 feet (4.5 m) wide. The survey area encompasses parts of residential parcels and a heavily vegetated parcel on the *makai* side of the bridge and part of residential parcels and an agricultural area on the *mauka* side of the bridge. The agricultural area and associated residence were not accessible during the site visit.

Elevations in the survey area range from sea level to roughly 18 feet (5.4 m) above sea level. The NRCS identifies the following two soil types in the survey area: Mokuleia clay loam, poorly drained variant and Hanalei silt clay, 0%–2% slopes (USDA 1972; NRCS 2013). Both soil types are considered hydric (NRCS 2012).

The NWI program identifies four wetland and water types in the survey area: Palustrine, Emergent, Semipermanently Flooded, Excavated (PEMFx); Palustrine, Forested, Seasonally Flooded (PFOC); Riverine, Tidal, Unconsolidated Bottom, Permanent-Tidal (R1UBV); and Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded (R2UBH). The State of Hawai‘i and the USGS identify two segments of Wainiha Stream traversing the survey area. The total length of this stream, according to the Atlas of Hawaiian Watersheds & Their Aquatic Resources (Parham et al. 2008c), is 1.1 miles (1.8 km).

The most dominant vegetation types in the Wainiha Bridges 2 & 3 survey area are emergent wetland and hau thicket. The emergent wetland is a dense mat of non-native California grass. It occurs in the portions of the survey area immediately adjacent to Wainiha Stream. Few other species occur in this mat, although Guinea grass, umbrella sedge, and Job’s tears (*Coix lachryma-jobi*) are widely scattered. The most common grasses and herbaceous species found in the ruderal vegetation type in the Wainiha Bridges 2 & 3 survey area are basketgrass, wedelia, Guinea grass, California grass, Hilo grass, honohono (*Commelina diffusa*), and Spanish needle (*Bidens alba*). Seedlings of non-native trees are sparsely scattered within the right-of-way. Large false kamani trees are also in the survey area, often covered in climbing taro vines. Several other vines are present, including taro vine, maunaloa, *Neonotonia wightii*, and white thunbergia (*Thunbergia fragrans*). Pai‘i‘ihā (*Cyclosorus dentatus*) and young Chinese fan palm (*Livistona chinensis*) are common in the understory. Ornamental species are also planted.

Approximately 0.94 acre (0.38 ha) of tidal, non-wetland WUS (R1) and 0.55 acre (0.22 ha) of wetlands (PEM and PFO) were delineated in the survey area. This segment of Wainiha Stream was determined to be tidally influenced because of its proximity to the ocean and the presence of marine/estuarine biota observed during SWCA’s fieldwork. The high tide line was determined using topography (i.e., a break in the slope and elevation) and vegetation line.

TABLE 3-4
Potential Waters of the U.S. Delineated in the Wainiha Bridges 2 & 3 Survey Area

WUS ID	Wetland Classification Code	Acres
01	PFO	0.30
02	PEM	0.14
03	R1UBV	0.32
04	PEM	0.09
05	PEM	0.02
06	R1UBV	0.62
Total		**1.49**

Wai'koko Stream (21016)

The Wai'koko Stream watershed (DAR Watershed Code: 21016) watershed is located on the windward North Coast of the Island of Kaua'i (Figure 3-3). The river flows from the eastern slope of Puu Ka Manu. The Hawaiian meaning of the river's name is "blood water". The area of the watershed is 0.7 square miles (1.8 square km), with a maximum elevation of 751 ft. The watershed is approximately 1 mile long and 0.6 mile wide at its widest point. The upper reaches of the watershed is dominated by mixed forest. The watershed has not been assigned a DAR cluster code. The percent of the watershed in the different land use districts is as follows: 90.4% agricultural, 9.6% conservation, 0% rural, and 0% urban (Parham et al., 2008c). Water conveyed by the Wai'koko Stream empties into Hanalei Bay, approximately 20 feet downstream from the project area.

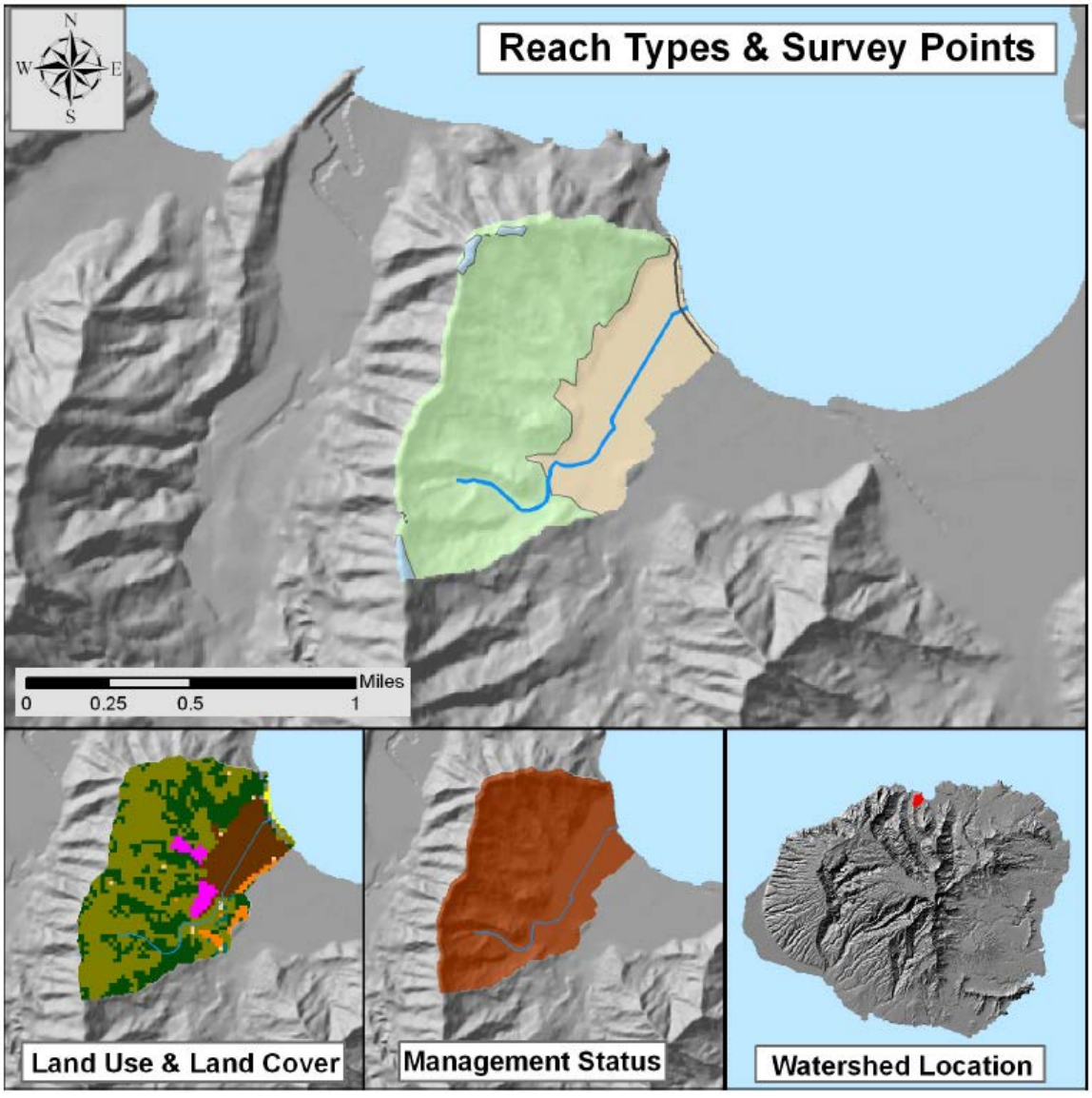

Figure 3-3. Wai'koko Watershed (21016)
(Source: Parham et al., 2008c)

The Wai'koko Stream is a perennial stream (Terminal Stream Order 1) that was not ranked in the 1990 Hawai'i Stream Assessment Rank. The total stream length is 1.1 miles (1.8 km) with 33.7 percent occurring in the middle reach type and 66.7 percent occurring in the lower reach type.

The Wai'koko Bridge survey area is approximately 0.8 mile (1.3 km) west of Hanalei and covers approximately 1.46 acres (0.59 ha). The existing bridge is approximately 25 feet (7.6 m) long and 15 feet (4.6 m) wide. The survey area consists of a beach on the *makai* side of the bridge and densely vegetated areas on the *mauka* side of the bridge. All four parcels were observed during the site visit.

Elevations in the survey area range from sea level to roughly 15 feet (4.5 m) above sea level. The NRCS identifies one soil type in the survey area (Table 7 in Appendix C report), Mokuleia fine sandy loam, which is not listed as a hydric soil (NRCS 2012).

The NWI program identifies two wetland and aquatic resource types in the survey area (Table 3-5): Marine, Intertidal, Unconsolidated Shore, Irregularly Flooded (M2USP) and Riverine, Upper Perennial, Rock Bottom, Permanently Flooded (R3RBH). The State of Hawai'i and the USGS identify Wai'koko Stream traversing the survey area.

The vegetation types in the Wai'koko Bridge survey area are ruderal vegetation, mixed non-native forest, hau thicket, and ornamental landscaping. Hau thickets are present on the *mauka* side of the bridge, adjacent to standing water. The mixed non-native forest is dominated by ironwood trees and large false kamani trees that create a dense canopy. Taro vine, maunaloa, and maile pilau (*Paederia foetida*) are climbing over trees, and patches of laua'e fern (*Phymatosorus grossus*) are present in the understory. The most common species in the ruderal vegetation along the highway are wedelia (*Sphagneticola trilobata*), wide-leaved carpetgrass, Guinea grass, Hilo grass, dallis grass (Paspalum dilatatum), narrow-leaved plantain (*Plantago lanceolata*), and short-stature koa haole (*Leucaena leucocephala*). Naupaka (*Scaevola taccada*), ti, hala (*Pandanus tectorius*), and coconut trees (*Cocos nucifera*) are planted in the survey area. The native *Cyperus polystachyos* and nanea (*Vigna marina*) were also seen at the survey area.

Approximately 0.80 acre (0.32 ha) of tidal, non-wetland WUS (R1 and M2) and 0.04 acre (0.02 ha) of wetlands (PFO) were delineated in the Waikoko survey area (see Appendix C). This segment of Wainiha Stream was determined to be tidally influenced because of its proximity to the ocean and the presence of marine/estuarine biota observed during SWCA's fieldwork. The high tide line was determined using topography (i.e., a break in the slope and elevation) and vegetation line. The types and acreage of WUS delineated by SWCA are summarized in Table 3-5 below.

TABLE 3-5
Potential Waters of the U.S. Delineated in the Waikoko Survey Area

WUS ID	Wetland Classification Code	Acres
10	M2USP	0.51
11	R1UBV	0.29
19	PFO	0.04
Total		**0.84**

Water Quality

According to 2014 DOH-CWB report the Wai'koko Stream has not been assessed for 303(d) impairments.

Waipā Stream (21017)

The Waipā Stream watershed (DAR Watershed Code: 21017) watershed is located on the windward North Coast of the Island of Kaua'i (Figure 3-4). The stream flows from the northern slope of Mount Mamalahoa. The Hawaiian meaning of the river's name is "touched water". The area of the watershed is 2.4 square miles (6.3 square km), with a maximum elevation of 3,576 ft. The watershed is approximately 3 miles long and 1 mile wide at its widest point. The upper reaches of the watershed is dominated by mixed forest and is

located within the Halele'a Forest Reserve. The watershed's DAR cluster code is 4, meaning that the watershed is medium size, steep in the upper watershed, and with embayment. The percent of the watershed in the different land use districts is as follows: 9.5% agricultural, 90.5% conservation, 0% rural, and 0% urban (Parham et al., 2008d). Water conveyed by the Waipā Stream empties into Hanalei Bay, approximately 0.04 miles downstream from the project area.

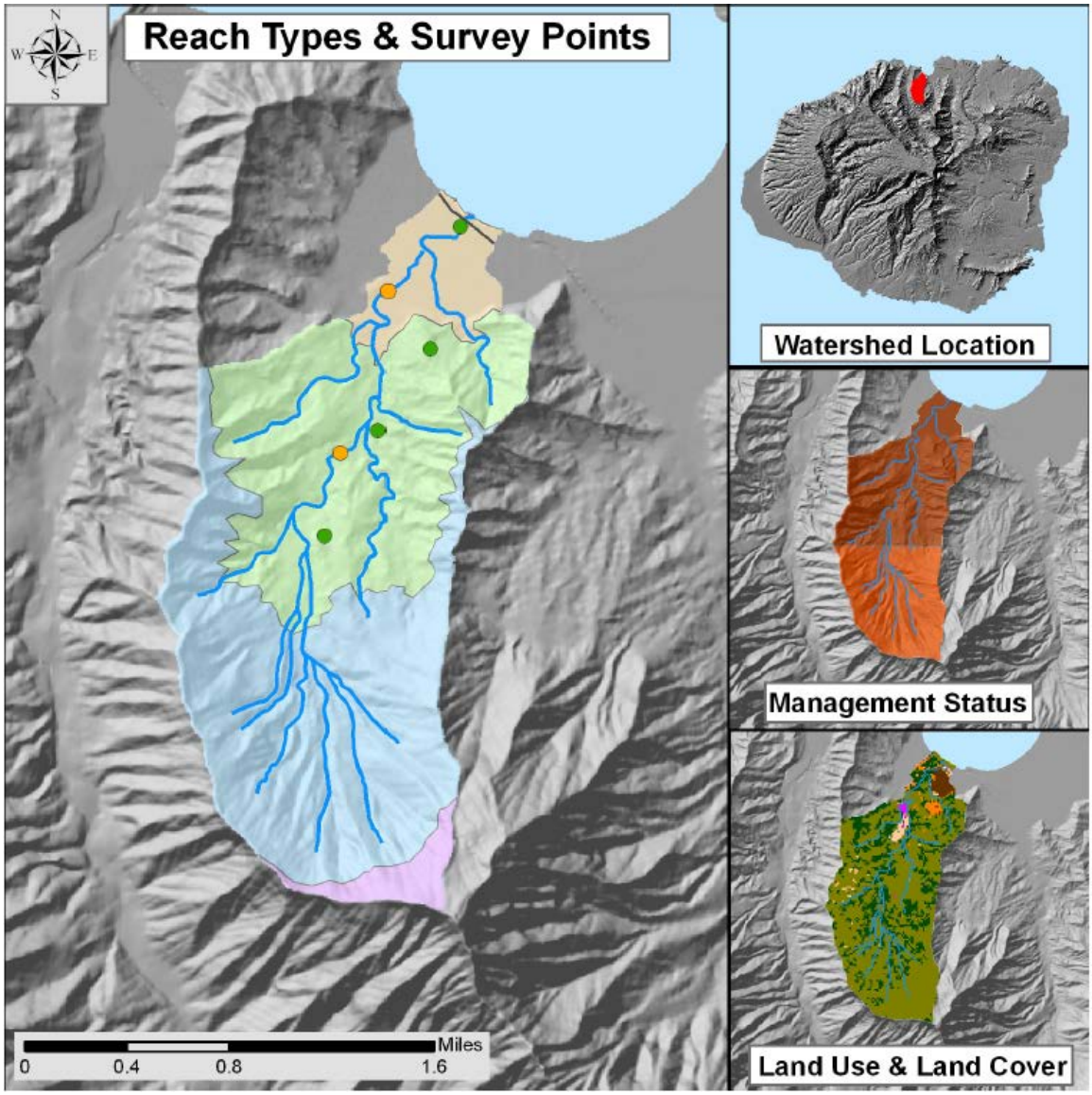

Figure 3-4. Waipā Watershed (21017)
(Source: (Parham et al., 2008d)

The Waipā Stream is a perennial stream (Terminal Stream Order 3) that is designated as substantial in the 1990 Hawai'i Stream Assessment Rank. The total stream length is 8.4 miles (13.6 km) with 46.1 percent occurring in the upper reach type and 53.9 percent occurring in the middle reach type.

The Waipā Bridge survey area is approximately 0.5 mile (0.8 kilometer [km]) west of Hanalei and covers approximately 1.45 acres (0.59 ha). The existing bridge is approximately 80 feet (24.4 m) long and 25 feet (7.6 m) wide. The survey area consists of wooded, undeveloped parcels on both the *makai* and *mauka* side of the bridge. There is also a recreational area for Kamehameha Schools on the *makai* side. All parcels were

surveyed during the site visit, although small portions of the residential areas on the east side of the stream were not accessed.

Elevations in the survey area range from sea level to roughly 11 feet (3.4 m) above sea level. The NRCS identifies two soil types in the survey area: Mokuleia fine sandy loam and beaches (USDA 1972; NRCS 2013). Neither is listed as a hydric soil (NRCS 2012).

The NWI program identifies two wetland and aquatic resource types in the survey area (Table 3-6): Palustrine, Forested, Seasonally Flooded (PFOC) and Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH). The State of Hawai'i and the USGS identify Waipā Stream traversing the survey area.

At the Waipā Bridge survey area, the vegetation is dominated by a dense hau thicket on both sides of the bridge. Little to no other plants occur in this vegetation type. Along the stream's edge, in areas where hau is not present, umbrella sedge and California grass are common. The ruderal vegetation type at Waipā is dominated by Hilo grass (*Paspalum conjugatum*) , Guinea grass (*Urochloa maxima*), wedelia (*Sphagneticola trilobata*), elephant grass (*Cenchrus purpureus*), West Indian dropseed (*Sporobolus indicus*), and basketgrass (*Oplismenus hirtellus*). Maunaloa (*Canavalia cathartica*) is climbing throughout. Ironwood trees (*Casuarina equisetifolia*) and false kamani (*Terminalia catappa*) are also present, primarily on the *makai* side of the bridge. The native kou (*Cordia subcordata*) is planted just along the edge of the survey area near the recreation area.

In all, approximately 0.31 acre (0.13 ha) of tidal, non-wetland WUS (R1) and 0.27 acre (0.11 ha) of wetlands (PFO) were delineated in the Waipā survey area (see Appendix C). A single perennial, non-wetland water (Waipā Stream) was identified in the survey area. This segment of Waipā Stream was determined to be tidally influenced due to its proximity to the ocean and the presence of marine/estuarine biota observed during SWCA's fieldwork. The high tide line was determined based on topography and the vegetation line. The stream mouth is shaped by a variety of natural conditions, and shifts throughout the year. Natural conditions influencing elevation and physical features near the mouth include streamflow, sediment deposition, ocean tide, and wave action. The types and acreage of WUS delineated by SWCA are summarized in Table 3-6.

TABLE 3-6
Potential Waters of the U.S. Delineated in the Waipā Survey Area

WUS ID	Wetland Classification Code	Acres
12	R1UBV	0.31
13	PFO	0.15
20	PFO	0.12
Total		**0.58**

Water Quality

According to 2014 DOH-CWB report the Waipā Stream has only been assessed during the dry season. During this assessment it was found to be in non-attainment for Turbidity and TSS and in attainment for Total Nitrogen, Total Phosphorus, Nitrate (NO3) and Nitrite (NO2). TMDLs for turbidity and TSS were approved in 2008. An assessment of E.coli impairment has not been completed for this water body.

Wai'oli Stream (21018)

The Wai'oli Stream watershed (DAR Watershed Code: 21018) watershed is located on the windward North Coast of the Island of Kaua'i (Figure 3-5). The stream flows from the northern slope of Mount Namolokama. The Hawaiian meaning of the river's name is "joyful water". The area of the watershed is 5.5 square mi

(14.2 square km), with maximum elevation of 4,409 ft. The watershed is approximately 4.75 miles long and 2 miles wide at its widest point. The upper reaches of the watershed is dominated by mixed forest and is located within the Halele'a Forest Reserve. The watershed has not been assigned a DAR cluster code. The percent of the watershed in the different land use districts is as follows: 5.9% agricultural, 92.5% conservation, 0% rural, and 1.7% urban (Parham et al., 2008e). Water conveyed by the Wai'oli Stream empties into Hanalei Bay, approximately 0.3 miles downstream from the project area.

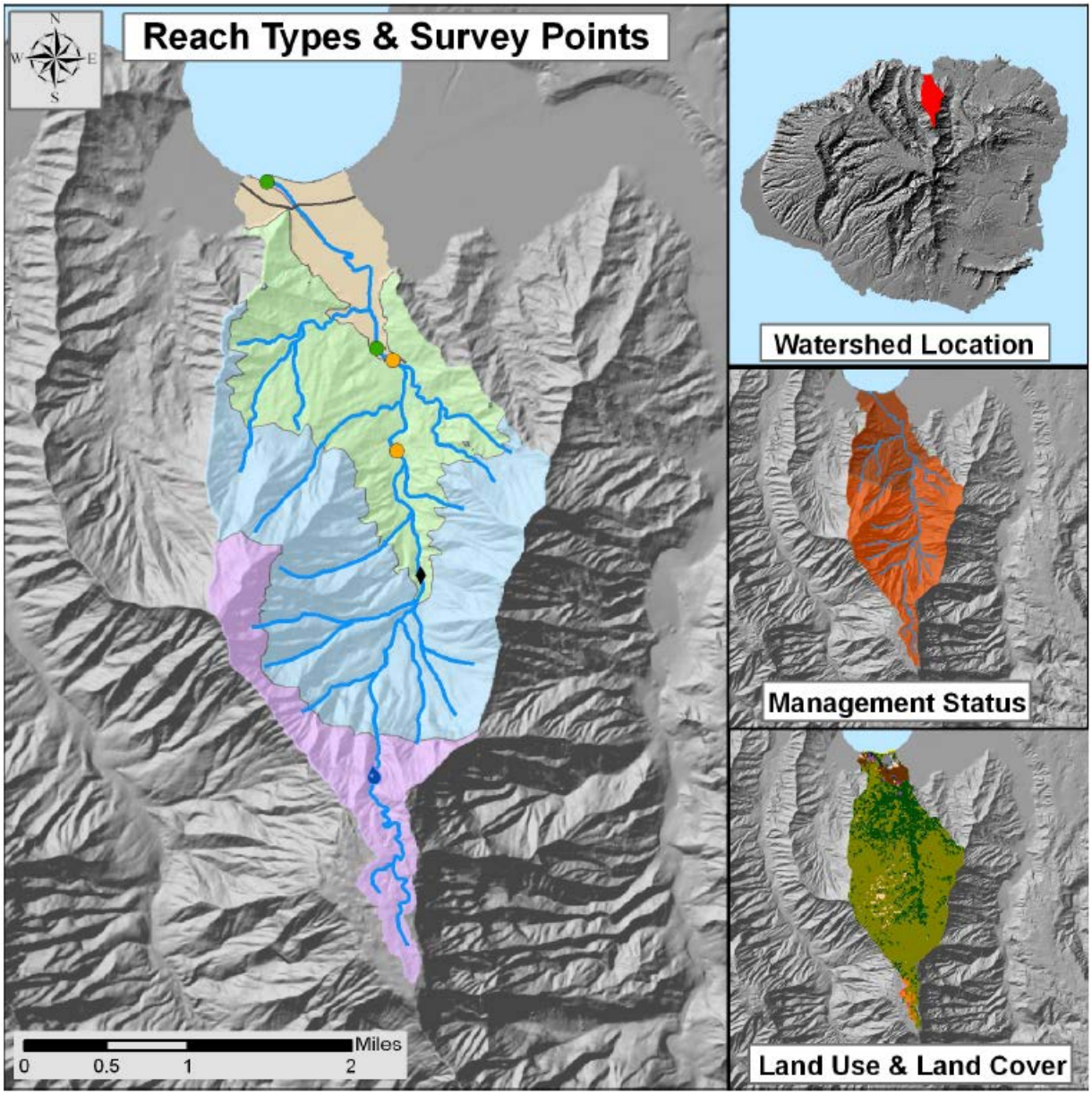

Figure 3-5. Wai'oli Watershed (21018)
(Source: (Parham et al., 2008e)

The Wai'oli Stream is a perennial stream (Terminal Stream Order 3) that is designated as substantial in the 1990 Hawai'i Stream Assessment Rank. The total stream length is 15.8 miles (25.4 km) with 13.3 percent occurring in the headwaters reach type, 43.2 percent occurring in the upper reach type, and 43.2 percent occurring in the middle reach type.

The Wai‘oli Bridge survey area covers approximately 1.26 acres (0.51 ha) and is roughly 1,300 feet (396 meters [m]) from the Wai‘oli Stream mouth. The existing bridge is approximately 100 feet (30.5 m) long and 15 feet (4.5 m) wide. The survey area encompasses parts of two residential parcels on the *makai* (seaward) side of the bridge and part of one residential parcel and an undeveloped parcel on the *mauka* (landward) side of the bridge. All four parcels were observed during the site visit.

Elevations in the survey area range from sea level to roughly 28 feet (8.5 m) above sea level. The NRCS identifies three soil types in the Wai‘oli Bridge survey area : Mokuleia fine sandy loam; Mokuleia clay loam, poorly drained variant; and rock outcrop (Foote et al. 1972; NRCS 2013). The Mokuleia clay loam, poorly drained variant soil type is listed as a hydric soil (NRCS 2012).

Approximately 0.31 acre (0.13 ha) of non-wetland WUS and 0.24 acre (0.10 ha) of wetlands (PEM and PFO) were delineated in the Wai‘oli survey area. A single perennial non-wetland water (Wai‘oli Stream) was identified in the survey area. This segment of Wai‘oli Stream is likely to be occasionally influenced by the tide due to its proximity to the ocean. The high tide line was determined using topography (i.e., a break in the slope and elevation) and vegetation lines. The types and acreage of WUS delineated by SWCA are summarized in Table 3-7.

TABLE 3-7
Potential Waters of the U.S. Delineated in the Wai‘oli Survey Area

WUS ID	Wetland Classification Code	Acres
14	R2UBH	0.31
15	PEM	0.04
16	PFO	0.10
17	PEM	0.05
18	PEM	0.05
Total		**0.55**

Water Quality

According to 2014 DOH-CWB report the Wai‘oli Stream is in attainment for all assessed criteria pollutants (Total Nitrogen, Total Phosphorus, Nitrate (NO_3) and Nitrite (NO_2), Turbidity, and Total Suspended Solids (TSS) for the dry season. An assessment of attainment during the wet season and Enterococci (E.coli) impairment has not been completed for this water body.

3.3.2.2 Ground Water

Ground water is one of Hawai‘i’s most important natural resources. It is used for drinking water, irrigation, and domestic, commercial, and industrial needs. Ground water provides about 99 percent of Hawai‘i’s domestic water and about 50 percent of all freshwater used in the State (Gingerich and Oki 2000). The major fresh ground-water systems are below the lowest water table, and are either freshwater-lens (aka Basal) or dike-impounded systems. Where basal and dike-impounded systems are adjacent, they form a single, hydrologically connected ground-water flow system. Minor perched systems can also exist above the lowest water table where low-permeability rocks impede the downward movement of ground water. Figure 3-6 provides a graphical representation of this.

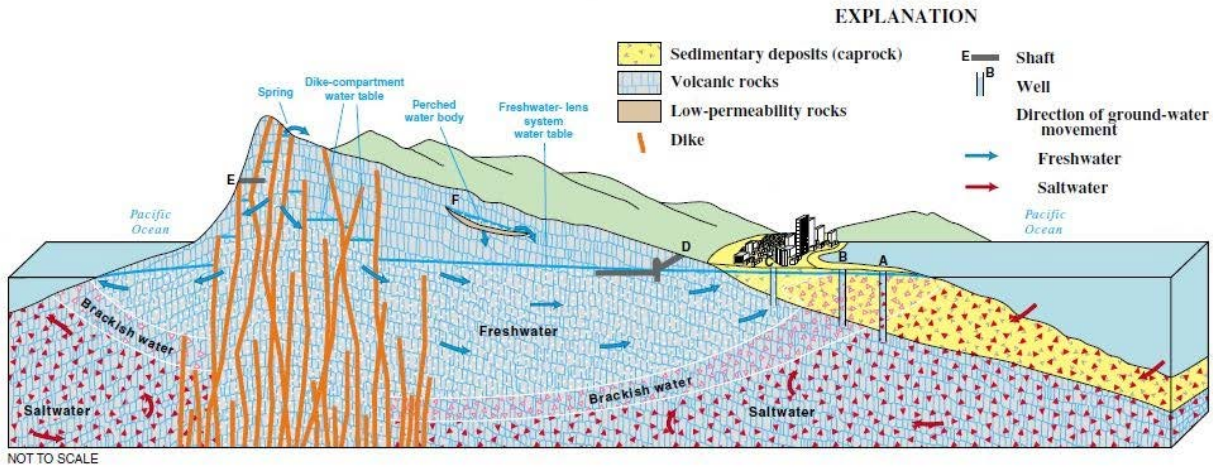

Figure 3-6. Groundwater in Hawai'i Aquifers
(Source: Gingerich and Oki 2000)

The predominant source of groundwater on Kaua'i is fresh water in the basal aquifer, which floats on and displaces salt water that saturates the base of the island. The second source of groundwater is fresh water that is contained in vertical dikes, which are present in rift zones. Rainwater is the ultimate source of groundwater; it percolates downward through porous and permeable materials, like basalt. Movement of groundwater is generally downgradient towards the ocean, and it typically discharges in seeps, springs, and streams. Coastal sediments can act to confine groundwater movement within underlying basalts, causing artesian conditions during discharge.

The project area occurs within two separate aquifer systems: The Wainiha Aquifer (20203) and the Hanalei Aquifer (20202), which are both underlain by a shallow and deep aquifer. The eight digit aquifer code provides a unique locator number where the first number is the island, the next two represent the sector, the following two represent the system and the last three represent the aquifer type. The five digit status code represents the aquifers status in five descriptive categories including: development stage, utility, salinity, uniqueness, and vulnerability to contamination. Below is a summary of the Wainiha and Hanalei aquifer systems.

The Wainiha aquifer is composed of the drainage basins of the Wainiha and Lumahai rivers, each a major river. On the west the drainage divide of Hanakapiai Stream is the divide, on the east the Hanalei divide is the boundary. The interior incorporates a part of the Alakai Swamp below Mt. Waialeale for a total area of 39 square miles (101.0 square km). The geology of this aquifer is comprised mostly of the olokele formation which covers the upper two thirds of the Wainiha aquifer system, and the Nāpali formation which covers the lower third. Both formations are intersected with dikes, but more visibly so in the Nāpali. Small patches of the koloa have minor hydrologic significance. Old alluvium reaches far inland in the major valleys, almost to 1,000 feet in the Wainiha Valley. A narrow coastal plain of sediments separates the Nāpali formation from the sea. Groundwater within this aquifer occurs primarily within high level dike aquifers in the Nāpali and Olokele formations. Drainage from these aquifers sustains much of the flow in the Wainiha and Lumahai rivers (Mink and Lau 1992).

The Aquifer code for the shallow aquifer within the Wainiha system is 20203111. This aquifer is defined as a basil (Freshwater in contact with Seawater) aquifer that is unconfined (water table is upper surface of saturated aquifer) and is a flank type aquifer (Horizontally extensive lavas which display the lowest heads). The status code for the shallow Wainiha aquifer is identified as 21221, which indicates a potentially usable aquifer that has drinking quality water with low salinity water (250-1,000 mg/l Cl^-) that is replaceable and has a high vulnerability to contamination (Mink and Lau 1992).

The Aquifer code for the deep aquifer within the Wainiha system is 20203122. This aquifer is defined as a basal aquifer that is confined (Aquifer is bounded by impermeable or poorly permeable formations; top of the saturated aquifer is below the surface of the groundwater), and is a dike type aquifer (Aquifers in dike compartments created by rift zones). The status code for the deeper Wainiha aquifer is identified as 21113, which indicates a potentially usable aquifer that has drinking quality water with freshwater (<250 mg/l Cl^-) that is irreplaceable and has a low vulnerability to contamination (Mink and Lau 1992).

The Hanalei River drainage boundaries incorporate the whole of the Aquifer System. On the west is the Lumahai divide, on the east the Kalihiwai divide. The interior boundary reachest almost to mt. Waialeale for a total area of 33 square miles (85.5 square km). The interior geology of the Hanalei aquifer occurs in the Olokele formation of the Waimea Canyon series. Downstream the Nāpali formation forms the west side of the drainage, the Koloa the east. Hanalei Valley separates the predominantly Koloa geologic province of eastern Kaua'I from the Waimea Canyon series on the west. Old alluvium reaches far up the valley. In the lower valley a wide and thick sequence of sediments extends inland as the valley floor. Near the coast, groundwater is basal in both the Koloa and Nāpali formations as well as the sediments. Upsteam, starting a mile or so inland, aquifers are high level (Mink and Lau 1992).

The Aquifer code for the shallow aquifer within the Hanalei system is 20202116. This aquifer is defined as a basal aquifer that is unconfined, and is a sedimentary type aquifer (non-volcanic lithology aquifer comprised of alluvial and marine sediments deposited by erosion and biogenic processes). The status code for the shallow Hanalei aquifer is identified as 22211, which indicates a potentially usable aquifer that has ecologically important water with low salinity that is irreplaceable and has a high vulnerability to contamination (Mink and Lau 1992).

The Aquifer code for the deep aquifer within the Hanalei system is 20202112. This aquifer is defined as a basil aquifer that is unconfined, and is a dike type aquifer. The status code for the deep Hanalei aquifer is identified as 21112, which indicates a potentially usable aquifer that has drinking quality water with freshwater levels of salinity that is irreplaceable and has a moderate vulnerability to contamination (Mink and Lau 1992).

3.3.3 Potential Impacts

3.3.3.1 No Action Alternative

The No Action Alternative would not impact water resources in the project area. These resources would continue to function in the current configuration. There would not be an increase in impervious area or result in any change to vegetative cover in the project area. Therefore, the No Action Alternative would not result in new short- or long-term impacts.

3.3.3.1 Action Alternative

Surface Waters

The location of jurisdictional WUS were assessed and delineated as described previously. Based on the nature of the action, the need to maintain public access and other logistical constraints permanent and temporary impacts to jurisdictional waters of the U.S. including wetlands are unavoidable. Within the five study areas the Pacific Ocean, four rivers/streams, five palustrine forested wetlands and six palustrine emergent wetlands were identified.

Section 404(b)(1) of the CWA stipulates that no discharge of dredged or fill material into waters of the U.S., which include wetlands, shall be permitted if there is a practicable alternative which would have a less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences. CFLHD has designed the proposed bridge replacements to have the smallest

impacts to the aquatic environment necessary while still meeting the purpose and need of the proposed action.

Throughout the design process, avoidance and minimization efforts are being applied to reduce impacts, whenever practicable as described below. However, the terrain in the project area, the high vehicular usage and the need to maintain public access along the roadway, and the requirement to construct in-water clear water diversion and isolation BMPs to facilitate temporary construction access and construction site dewatering within the project area does not allow for a total avoidance of impacts to jurisdictional aquatic resources. Under the Action Alternative, Table 3-8 below identifies the approximate anticipated permanent and temporary impacts to surface waters. The Action Alternative has been designed thus far to avoid and minimize impacts to these features to the greatest extent practicable. Design is still in the preliminary stages and the numbers presented below are approximate. Efforts to minimize impacts will continue through final design.

TABLE 3-8

Extent of Impacts to Wetlands and Other Waters of the U.S.

Jurisdictional Water Type	Permanent Impacts (Acre)	Temporary Impacts (Acre)*	Total (Acre)
Wainiha Bridges 2 and 3			
PFO Wetlands	0.056	0.129	0.185
PEM Wetlands	0.026	0.205	0.231
Wainiha River (R1UBV)	0.103	0.396	0.499
Wainiha Bridge 1			
Wainiha River (R2RB)	0.024	0.021	0.045
E1UBL	0.012	0.118	0.13
Wai'koko			
PFO Wetlands	0	0.009	0.009
M2USP	0	0.063	0.063
R1UBV	0	0.193	0.193
Wai'oli			
PFO Wetlands	0	0.066	0.066
PEM Wetlands	0	0.059	0.059
Wai'oli Stream (R2UBH)	0	0.216	0.216
Waipā			
PFO Wetlands	0	0.207	0.207
Waipā Stream (R1UBV)	0	0.198	0.198
*Temporary impacts have been approximated to accommodate for the placement of temporary roadway bypass, in-water diversion and isolation BMPs, and temporary construction access and dewatering of work zones.			

Ground Waters and Water Quality

Roadways generally generate the following potential or expected pollutants:

- Sediment / turbidity;
- Nutrients, including ammonia, nitrate (nitrogen), total phosphorus, dissolved ortho-phosphate;
- Organic compounds, including total dissolved solids, total suspended solids, dissolved organic carbon, and total organic carbon;
- Trash and debris;
- Oxygen-demanding substances;
- Bacteria;
- Oil and grease;
- Pesticides; and
- Metals, including arsenic, cadmium, chromium, copper, lead, nickel, and zinc.

Direct effects to water quality from bridge construction and replacement can be caused by increased sediment or release of pollutants from construction equipment. Without proper site preparation and planning, sedimentation and chemicals from construction activities may enter surface or ground waters within the project area such as the Wainiha River, Wai'koko Stream, Wai'oli Stream, Waipā Stream or their downstream receiving waterbodies (i.e. Pacific Ocean). The greatest likelihood for sediment or chemicals to enter these waterbodies would be during instream activities to install and remove in-stream clear water diversion or isolation technique(s) BMPs which will separate the in channel work zones from flowing waters. These in water BMPs would be needed to facilitate the construction of temporary detours that are necessary to maintain public access, and structural bridge components such as abutments, piers and scour protection measures. On the Wainiha River, the existing ACROW bridges will be relocated to construct the temporary detours on the *makai* side of the existing structures (Wainiha Bridges 1-3). These temporary crossings would span a majority of the river except for minor encroachment at the temporary abutment and pier locations. CFLHD is continuing to avoid and minimize the amount of permanent and temporary fill needed to construct these bridges to minimize the potential for water quality effects such as increased stream turbidity. Work that is performed for bridge demolition and construction activities over surface waters and along the stream banks could also increase the chance for introducing sediment and chemicals to the waterways.

At this time, the amount of work that would be performed within jurisdictional surface waters has been approximated in Table 3-8 above. If riprap is hydraulically necessary to protect structure abutments the placement of riprap for scour protection would be installed while isolated from flowing water by utilizing in-water clear water diversion and isolation techniques BMPs.

During the construction of the temporary detours, the free flowing nature of channel would be maintained but may be slightly constricted from the construction of temporary abutments to support the temporary detour bridges. Instream placement of in-water clear water diversion and isolation BMPs and their subsequent removal would likely cause temporary short-term increases in turbidity and has the potential to introduce chemicals. Sediment from construction activities could increase the concentration of fine sediments within the project area.

Direct release of sediment or chemical-laden runoff from construction sites into surface or groundwater areas may degrade water quality and available habitats. Sediment and increased turbidity from construction activities could increase the concentration of fine sediments in streams which could impede egg hatching, feeding, migration, or general use by native aquatic species. Hazardous materials and chemicals in the form of gasoline, engine oil, lubricants, or other fluids used during construction activities could also potentially enter surface or ground waters as a result of seepage or accidental spills from construction equipment. Accidental discharge of hazardous materials and chemicals could potentially affect aquatic species that may

be present in the project area by increasing physiological stress, altering primary and secondary production, disrupting prey, and causing direct mortality. To reduce the risk of this impact, instream and upland best management practices (BMPs) will be installed and maintained to reduce sediment and chemical-laden runoff introductions during and after construction. These BMPs would help to minimize potential direct effects to water quality and aquatic species (or their habitats) that may be present in the project area.

The project may result in indirect effects to water quality and stream habitat due to chemical runoff, erosion, and sedimentation from the bridge replacement. The project may result in indirect effects to water quality and stream habitat due to erosion and sedimentation from soil and ground disturbance. Indirect effects may also occur due to vegetation removal within the project area. Removal of riparian vegetation increases erosion potential and subsequently can cause sedimentation. Removal of riparian vegetation may also increase water temperature and remove a source of nutrients. Loosening soils from road construction and placing fills near open water has the potential to introduce sediment into these waterways. Removal of vegetation and construction-related ground disturbance in the project area may increase sediment introduction to the waters within the project area following construction if vegetation is not restored or the disturbed areas are not stabilized. BMPs that include planting and reseeding have been developed for areas where ground disturbance and the removal of vegetation would occur. Overall, the proposed project would be localized and short-term in duration and is not expected to cause long term impacts to water quality or adversely modify the habitat characteristics provided by the water resources within or adjacent to the project limits.

Without avoidance and minimization measures, the project would be expected to result in short- and long-term impacts to water quality. These impacts include:

- Sediment: Excessive sedimentation degrades aquatic habitat. Suspended sediment increases turbidity and reduces aquatic plant life productivity. Suspended sediment can also cause reduction in dissolved oxygen levels which can be fatal to aquatic species.
- Metals: Metals that bind to suspended solids and decaying organic matter can persist in the environment for long periods of time. These metals can be transferred from one organism to another in aquatic species and cause contamination of water supplies.
- Nutrients: Excessive nutrients, particularly nitrogen and phosphorous, can cause extreme algal growth which can be toxic to certain aquatic organisms. Algal blooms and subsequent die-off causes large variations in dissolved oxygen levels and in some cases can cause fish kills.
- General Construction: Construction vehicles can remove vegetation and deposit sediment onto surrounding roads, which can later cause erosion and allow for sediment to wash into waterways. Construction site debris, if not prevented or removed regularly, can blow away in the wind or wash away into waterways.
- Storm Water: Vegetation removal and increased impervious areas at construction sites can increase storm water runoff velocity and volume, causing accelerated erosion. The increased impervious area collects increased pollutant loading. Increased velocity in channelized waterways exacerbates erosion and sedimentation. The combination of these factors can result in transport of more contaminants to waterways.

Preventing potential impacts to water quality as a result of construction takes priority over mitigation for water quality impacts. CFLHD has created many avoidance and minimization measures to prevent impacts from occurring in our Standard Specifications for the Construction of Roads and Bridges on Federal Highways (referred to as FP-14). Additionally, Section 402 of the CWA requires projects to acquire permits for various activities in order to avoid and minimize impacts. Treatment BMPs must be implemented to target the areas of concern in the storm water runoff from the project area and where feasible and Treatment Control BMPs would be incorporated. If BMPs are properly selected, implemented, and maintained; then no adverse water quality impacts are expected during construction of the project.

3.3.4 Avoidance, Minimization, and Minimization Measures

Surface Water

With the following measures, impacts would be less than significant. As stated previously, all avoidance and minimization efforts will be detailed in full within the 404 and 401 permit application and include, but are not limited to the following:

- Obtain a Section 404 Permit, a Section 401 Water Quality Certification, and a stream channel alteration permit, from the USACE, the DOH-CWB and the Hawai'i Commission on Water Resources Management, respectively, requesting authorization for impacts to jurisdictional waters. CLFHD will ensure all permit terms and conditions are met, including any mandated offsets to permanent impacts.
- The roadway alignment is being designed to follow the existing alignment as much as possible.
- The slopes are steepened to reduce and/or avoid impacts to jurisdictional features.
- The proposed alignment will be shifted in allowable areas to reduce and/or avoid impacts to jurisdictional features.
- Reinforced soil slopes and/or walls may be utilized in practicable areas along the roadway to reduce the slope and avoid impacts to jurisdictional features.
- Equipment shall not be operated, and materials shall not be discharged, within the boundaries of wetlands and waters of the United States without the proper permits. Fording of running streams with construction equipment will not be allowed. Temporary bridges shall be used whenever crossing of the creek is necessary.

In addition, to ensure excavated soil is not disposed of in a manner or location to create indirect effects to other environmental resources (such as, wetlands and other waters), FHWA-CFLHD will require that the excavated soil be used onsite to the extent practicable, or properly disposed of in an approved and permitted location.

Only Practicable Finding

According to the U.S. Department of Transportation's (DOT) 5660.1A, the federal policy dictating implementation of EO 11990, new construction located in wetlands is to be avoided unless there is no practicable alternative to the construction and the proposed action includes all practicable measures to minimize harm (DOT 1978). As stated previously, the terrain within the project area does not allow for total avoidance of jurisdictional features based on the Action Alternative. Extensive design and planning approaches to avoid and minimize jurisdictional features have been put in place.

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in jurisdictional features and that the proposed action includes all practicable measures to minimize harm to jurisdictional features that may result from such use.

Ground Waters and Water Quality

Impacts related to water resources and water quality would be less than significant. The following measures would be implemented to avoid or minimize the potential for effects.

- Treatment BMPs have varying levels of effectiveness in treating specific pollutants. FHWA-CFLHD will consider this data when developing appropriate water quality treatment solutions for the project in close coordination with our contractor.

Potential water quality impacts to surface waters during construction of the project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling.

A NPDES General Permit for Storm Water Associated with Construction Activity, as administered by the State DOH, will be required to control storm water discharges. Mitigation measures will be instituted in accordance with site-specific assessments, incorporating appropriate structural and/or non-structural BMPs, and minimizing time of exposure between construction and re-vegetation.

As part of the Stormwater Pollution Prevention Plan (SWPPP), the CFLHD will prepare and implement an erosion control and restoration plan to control short- and long-term erosion and sedimentation effects, and to restore vegetation and stabilize soils in areas affected by construction activities. The plan will include necessary requirements regarding erosion control, and will implement BMPs for erosion and sediment control as required. Following construction, restoration would occur to temporary work areas disturbed during construction. Only appropriate non-invasive plant material will be used for erosion control and restoration. BMPs will be placed on all disturbed slopes and material storage sites, as indicated by the FHWA Erosion Control Plan. FHWA-CFLHD also will ensure compliance with the FP-14 and the following measures:

- Apply best degree of treatment or control measures to the potential water pollutant discharges associated with the proposed construction activity(ies) that assures the discharges will meet requirements compatible with the basic water quality criteria applicable to all waters, uses and specific water quality criteria and recreational criteria established for the class of the receiving State waters. Best Management Practices (BMPs) shall be properly implemented and maintained during the entire construction period. The contractor shall completely isolate and confine all in-water work areas throughout the entire water column (surface to bottom) such that all potential water pollutants will not leave or enter the work area. The entire volume of water in the in-water work area needs to be isolated and confined. A vessel/barge may be operated outside of the isolated and confined in-water work area only if it is surrounded by a boom.
- Only utilize BMPs that are inert and not sources of pollution itself. (Examples of inappropriate in-water BMPs include, but are not limited to: compost biosocks since it is a source of nutrients; silt fence since the material is porous; and a soil berm since the soil particles will erode away). Ensure that all material(s) placed or to be placed in State waters are free of waste material, heavy metals, organic materials, debris and any water pollutants at toxic or potentially hazardous concentrations to aquatic life as specified in HAR, §11-54-4(b).
- Isolate and confine all upland activity to contain/retain water pollutants upland and not allow it to enter State waters, including the designated in-water work area. When it is necessary to conduct in-water work, the workspace shall be isolated to avoid construction activities in flowing water in compliance with the following manual: “An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawai‘i, by the Federal Highway Administration and Hawai‘i Department of Transportation, Practitioners Guide”. The proposed project shall maintain aquatic organism passage through the project area. Adequate water depth and channel width must be maintained at all times for passing design flood discharges. Prior to construction activities, the workspace would be isolated from flowing water to prevent sedimentation and turbidity and avoid impacts to aquatic organisms and water quality. The diversion or isolation BMPs shall remain in place throughout the entire period of in-water work; and are not removed until the water quality in the in-water work area has returned to its pre-construction condition. In-water BMPs shall be removed immediately after work is completed in a manner that would allow flow to resume with the least disturbance to the substrate.
- For a river, stream, ditch, or gulch: Allow unimpeded flow around the isolated and confined in-water work area to allow for aquatic animal migration and/or to prevent downstream flooding situations. The unimpeded flow shall be equivalent to a two (2) year, 24 hour duration storm event and/or the existing flow capacity of the river, stream, ditch, or gulch, whichever is smaller.
- Collect water pollutants (including, but not be limited to, airborne particulate; dust, concrete slurry, concrete chips, concrete surface preparation washing effluent, construction debris, etc.) from localized

work areas and not allow these water pollutants to enter or re-enter State waters, including the in-water work area.

- Ensure that all construction debris is contained and prevented from entering or re-entering State waters. During bridge removal, construct structurally adequate debris shields to contain debris. Do not permit debris to enter waterways, travel lanes open to public traffic, or areas designated not to be disturbed. If portions of the existing bridge do fall into a stream during demolition, they will be removed from the stream without dragging the material along the streambed.
- Ensure that all erosion and sediment BMPs around the perimeter of the project are deployed prior to the commencement of any construction work (including grading and grubbing); are properly maintained throughout the entire period of in-water work; and are not removed until the in-water work is completed and the water quality in the in-water work area has returned to its pre-construction condition as demonstrated by the monitoring results (if applicable).
- Comply and require all of their contractors and subcontractors to comply with all requirements of the Section 401 WQC; WQS in HAR, Chapter 11-54; and all information submitted to the DOH-CWB for compliance with the Notification and Reporting Requirements. Ensure that the activity will not result in non-compliance or violations to the applicable State WQS. Ensure that all discharges associated with the proposed construction activities are conducted in a manner that will comply with "Basic Water Quality Criteria Applicable to All Waters" as specified in HAR, §11-54-4. During construction Impact Station water quality parameter levels that are greater than during construction upstream/updrift water quality parameter levels constitute a non-compliance of HAR, § 11-54-4(a) requirements that prohibits substances attributable to domestic, industrial, or other controllable sources of pollutants, which includes but is not limited to materials that will settle to form objectionable sludge or bottom deposits; visible floating debris, oil, grease, scum, other floating materials; and objectionable color or turbidity plumes. Comply with all new State WQS adopted by the DOH after the effective date of WQC.
- If required, conduct or contract with a qualified laboratory/environmental consultant to conduct the pre-construction, during construction, and post construction monitoring requirements in the Applicable Monitoring and Assessment Plan. Test methods promulgated in 40 CFR Part 136 effective on July 1, 2011, and when applicable, the chemical methodology for sea water analyses (HAR, § 11-54-1 0) shall be used. The detection limits of the test methods used shall be equal to or lower than the applicable WQS as specified in HAR, Chapter 11-54. For situations where the applicable WQS is below the detection limits of the available test methods, the test method which has the detection limit closest to the applicable WQS shall be used. If a test method has not been promulgated for a particular parameter, the applicant may submit an application through the Director for approval of an alternate test procedure by following 40 CFR 136.4. Comply with any modification to the sampling locations, frequencies, and/or parameters as instructed by the DOH-CWB for corrective/remedial action.
- Immediately cease the portion of the construction work if water quality monitoring or daily inspection or observation result(s) indicates that noncompliance to HAR, §11-54-4(a) or §11-54-4(b), will occur or is occurring. The construction activity shall not resume until adequate measures are implemented and appropriate corrective actions are taken and water quality monitoring demonstrates that the non-compliance has ceased. Note: These actions shall not preclude the DOH-CWB from taking enforcement action authorized by law.
- The area beyond the construction limits will not be disturbed. Trees, shrubs or vegetated areas temporarily damaged by construction operations will be re-vegetated.
- Hold clearing and grubbing to a minimum.
- Temporary soil stabilization shall be applied on areas that will remain unfinished for more than 14 calendar days. Vegetated areas temporarily impacted will be revegetated by planting and seeding with

non-invasive trees, shrubs and/or herbaceous perennials and annuals. Permanent soil stabilization shall be applied as soon as practicable after final grading.

- Turf establishment will be applied to finished slopes and ditches within 14 days after completion.
- Certified weed free permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction according to the contract erosion control plan, contract permits, FP Section 107, FP Section 157 and SCR Section 157 will be provided.
- Seeded areas will be protected and cared for, including watering when needed until final acceptance. All damages to seeded areas will be repaired by reseeding, re-fertilizing and re-mulching.
- Ensure that all temporarily constructed structures, such as the silt containment device(s), floating oil and grease as well as construction debris containment device(s), berm, cofferdam, sheet pile, stream flow diversion structure(s), and/or sediment and soil erosion control structure(s), etc., are properly removed immediately after the completion of the construction work and when the affected water body has returned to its pre-construction condition or better, as demonstrated by the monitoring results, including color photographs.
- Ensure that the proposed construction activities related discharges not covered under the applicable permits will also comply with State water pollution control permitting requirements under National Pollutant Discharge Elimination System (NPDES) as established in HAR, Chapter 11-55:
- Obtain NPDES permit for storm water discharges associated with construction activities when the proposed construction activities will disturb one (1) or more acres of land area before initiating any construction activities;
- Pesticides application in State waters shall comply with HAR, §§11-54-4(a), 11-54-4(b), 11-54-4(c), 11-54-4(f) and/or Chapter 11-55, Appendix M - NPDES General Permit Authorizing Point Source Discharges from the Application of Pesticides.
- Ensure that no concrete truck wash water is disposed by percolation into the ground.
- Maintain and require all of their contractor(s) and the subcontractor(s),that are performing work covered under the applicable permits, to maintain at the construction site or in the nearby field office, a copy of all permits, all Notification and Compliance Reporting Requirements, and all records demonstrating that every requirement of the permits have been complied with.
- Ensure that all areas temporarily impacted, either directly or indirectly, by the project construction activities are fully restored to its pre-construction conditions. For example: Incidental construction debris is cleaned up prior to removal of BMPs.
- Discontinue work during storm events or during flood condition.
- Modify environmental protection measures, including BMPs and monitoring requirements, when instructed by the DOH-CWB for corrective action/remedial actions.
- Allow the USACE, DOH-CWB, or other regulatory agencies to conduct routine inspections of the construction site in accordance with applicable permits and HRS, §342D-8.
- Complete and submit a Solid Waste Disclosure Form for Construction Sites to the DOH, Solid and Hazardous Waste Branch, Solid Waste Section. The form can be downloaded at: http://health.Hawai‘i.gov/shwb/files/2013/06/swdiscformnov2008.pdf.
- Do not stockpile, store, or place construction material or construction activity-related materials in State waters or in ways that will disturb or adversely impact the aquatic environment.
- Dispose of construction debris, waste products, vegetation and/or dredged material removed from the construction site at upland State and County approved sites.

- Contain on land and not allow to enter or re-enter State waters any runoff, return flow, or airborne particulate pollutants, if any, from the excavated/dredged material dewatering process or from the stockpiling site.
- Ensure that their discharge activity shall not interfere with or become injurious to any designated uses (HAR, §11-54-1 and HAR, §11-54-3), or existing uses (HAR, § 11-54-1 and HAR, § 11-54-1 .1). The owner of the discharge shall maintain and protect all designated and existing uses.
- Do not discharge any effluent associated with the proposed construction activities, such as dewatering effluent, effluent resulting from hydroblasting, saw cutting, concrete surface preparation, rock washing, concrete and rock truck washing effluent or any other similar regulated activity(ies). Effluent shall be properly contained, collected and prevented from entering, either directly or indirectly, State waters, except for those discharges that have received authorization issued by the DOH-CWB under the NPDES Permit as applicable.
- Allow concrete surfaces to cure for seven (7) days prior to contact with any flowing or open water.
- For dewatering that may be required during excavation or construction of the project, a NDPES General Permit for Construction Activity Dewatering would be required for discharging dewatering effluent into waters of the U.S. The permit will require appropriate BMPs, an erosion control plan, and a water quality monitoring plan to mitigate any impacts on receiving waters.
- Appropriate and effective measure(s) shall be implemented to properly contain/collect the potential water pollutant discharges resulting from the application of concrete corrosion inhibitor; or from the scrubbing, chipping, cutting, rebar reinforcing, grouting, filling activities needed for the permitted construction activity(ies).
- In Hawai‘i, the Commission on Water Resource Management (CWRM) issues permits regulating withdrawals of surface and groundwater. If water drafting is necessary, CFLHD will ensure this water use is approved in accordance with a streamwater use permit obtained from the CWRM (HRS §174C-48 (1987)).
- Structures designed to minimize sediment and pollutant runoff from sensitive areas such as settling ponds, vehicle and fuel storage areas, hazardous materials storage sites, erosion control structures, and coffer dams shall be visually monitored daily, especially following precipitation events to ensure these structures are functioning property.
- Temporary erosion control measures will be maintained in working condition until the project is complete or the measures are no longer needed as outlined in FP Section 15.
- Rain Event Action Plan (REAP) will be developed prior to Notice to Proceed. The REAP will be reviewed and structured to address project specific actions that are needed to prevent pollutants from reaching surface waters during the rain event. The REAP will be executed within 48 hours prior to a forecast rain event of 50% chance of precipitation or more. BMPs in the REAP include:
    - Place temporary stabilization BMPs (i.e. mulch) on the area that has been cleared to prevent raindrop erosion.
    - Any area that has soil disturbances will be stabilized prior to rain events with mulch, wood chips, or other protective covers.
    - Sediment traps will be placed to collect the water and allow sediment to settle out. If sediment traps are not possible, other settling and filtering devices will be used to slow water down and remove sediments.
    - Operations will shut down during extreme rain events.

  - Fueling and equipment repair areas will be covered and surrounded by a secondary containment BMP (i.e. impermeable berm designed to hold volume of fuel stored in area).
  - Exposed soil will be covered and/or stabilized.
  - Treated materials will be covered or placed in a shed.
  - Dumpsters will be covered at all times.
  - Drain holes will be plugged.
  - Control perimeters will be established around stockpiles of material.

- Submit a Spill Prevention, Control, and Countermeasure (SPCC) Plan at least 2 days before beginning work.
- Any spill of petroleum products, hazardous materials, or other chemical or biological products released from stationary sources or construction, fleet, or other support vehicles shall be properly cleaned, mitigated, and remedied, if necessary. Any spill of petroleum products or a hazardous material shall be reported to the appropriate federal, state, and local authorities, if the spill is a reportable quantity. Response shall occur in accordance with federal, state, and local regulations.
- In general, when gasoline, diesel fuel, antifreeze, hydraulic fluid or any other chemical contained within the vehicle is released to the pavement or the ground, proper, corrective, clean-up and safety actions specified in the SPCC and SWPPP will be immediately implemented. All vehicles with load rating of two tons or greater will carry, at minimum, enough absorbent materials to effectively immobilize the total volume of fluids contained within the vehicle.
- Leaks will be repaired immediately on discovery. Equipment that leaks will not be used. Oil pans and absorbent material will be in place prior to beginning repair work. The contractor will be required to provide the “on-scene” capability of catching and absorbing leaks or spillage of petroleum products including antifreeze from breakdowns or repair actions with approved absorbent materials. A supply of acceptable absorbent materials at the job site in the event of spills, as defined in the SWPPP will be available. Sand and soil are not approved absorbent materials. Soils contaminated with fluids will be removed, placed in appropriate safety containers, and disposed of according to state and/or federal regulations.
- All waste fuels, lubricating fluids, and other chemicals will be collected and disposed of in a manner that ensures that no adverse environmental impact will occur. Construction equipment will be inspected daily to ensure hydraulic, fuel and lubrication systems are in good condition and free of leaks to prevent these materials from entering any stream. Vehicle servicing and refueling areas, fuel storage areas, and construction staging and materials storage areas will be sited a minimum of (50 feet) 15 meters from ordinary high water, typically referred to as the Q2 elevation, wetlands, and contained properly to ensure that spilled fluids or stored materials do not enter any stream or wetland.

3.4 Coastal Zone

3.4.1 Regulatory Setting

3.4.1.1 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (U.S.C. Sections 3501 et seq., as amended in 1990 under the Coastal Zone Act Reauthorization Amendments), administered by the National Oceanic and Atmospheric Administration’s Office of Ocean and Coastal Resource Management, provides for management of the nation’s coastal resources and balances economic development with environmental conservation. The purpose of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 is to improve the management of the coastal zone and enhance environmental protection of coastal zone resources. The

overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

Section 307 of the CZMA, requires federal agency activities and development projects affecting any coastal use or resource to be undertaken in a manner consistent to the maximum extent practicable with the state's Coastal Zone Management (CZM) program. Also, activities requiring a federal permit or license, and activities conducted with federal financial assistance, that affect coastal uses and resources must be conducted in a manner consistent with the state's CZM program. The CZMA federal consistency provision ensures that federal agencies cannot act without regard for, or in conflict with, state policies that have been officially incorporated into a state's CZM program. Federal actions affecting any coastal use or resource must be reviewed by the state CZM program to ensure that proposed activities are consistent with state enforceable policies.

Section 6217 of CZARA seeks to address non-point source pollution (NPS) problems in coastal waters by implementing the Coastal Nonpoint Pollution Control Program (CNPCP). The CNPCP is a statewide coastal zone program that establishes and oversees a set of management measures to prevent and reduce NPS pollution from six sources: forestry, agriculture, urban areas, marinas, hydromodifications, and wetlands and riparian areas. The CNPCP also includes a monitoring and tracking condition to ensure that the management measures are being implemented. This program is administered jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA)(DOH-CWB 2015).

In 1977, Hawai'i enacted HRS Chapter 205A, Hawai'i CZM Program, to carry out the State's CZM policies and regulations under the Federal CZM Act (as discussed in section 4.1.14). The CZM area encompasses the entire State, including all marine waters seaward, to the extent of the State's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. As a result, the project is within the CZM area and is subject to consistency with the objectives and policies of the Hawai'i CZM Program. The CZM Federal Consistency Certification is reviewed by the State Office of Planning.

The Hawai'i CZM Program focuses on ten policy objectives (HRS Chapter 205A):

1. Recreational resources;

   (A) Provide coastal recreational opportunities accessible to the public.

2. Historic resources;

   (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

3. Scenic and open space resources;

   (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

4. Coastal ecosystems;

   (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

5. Economic uses;

   (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

6. Coastal hazards;

(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

7. Managing development;

   (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

8. Public participation;

   (A) Stimulate public awareness, education, and participation in coastal management.

9. Beach protection;

   (A) Protect beaches for public use and recreation.

10. Marine resources;

    (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

The Special Management Area (SMA) permit was established in 1975 with the enactment of Act 176, known as the Shoreline Protection Act. The Hawai'i legislature in enacting Part II of HRS Chapter 205A found that: "special controls on developments within an area along the shoreline are necessary to avoid permanent losses of valuable resources and the foreclosure of management options, and to ensure that adequate access, by dedication or other means, to public owned or used beaches, recreation areas, and natural reserves is provided." Figure 3-7 below provides a spatial perspective for where the SMA fits within the larger CZM network.

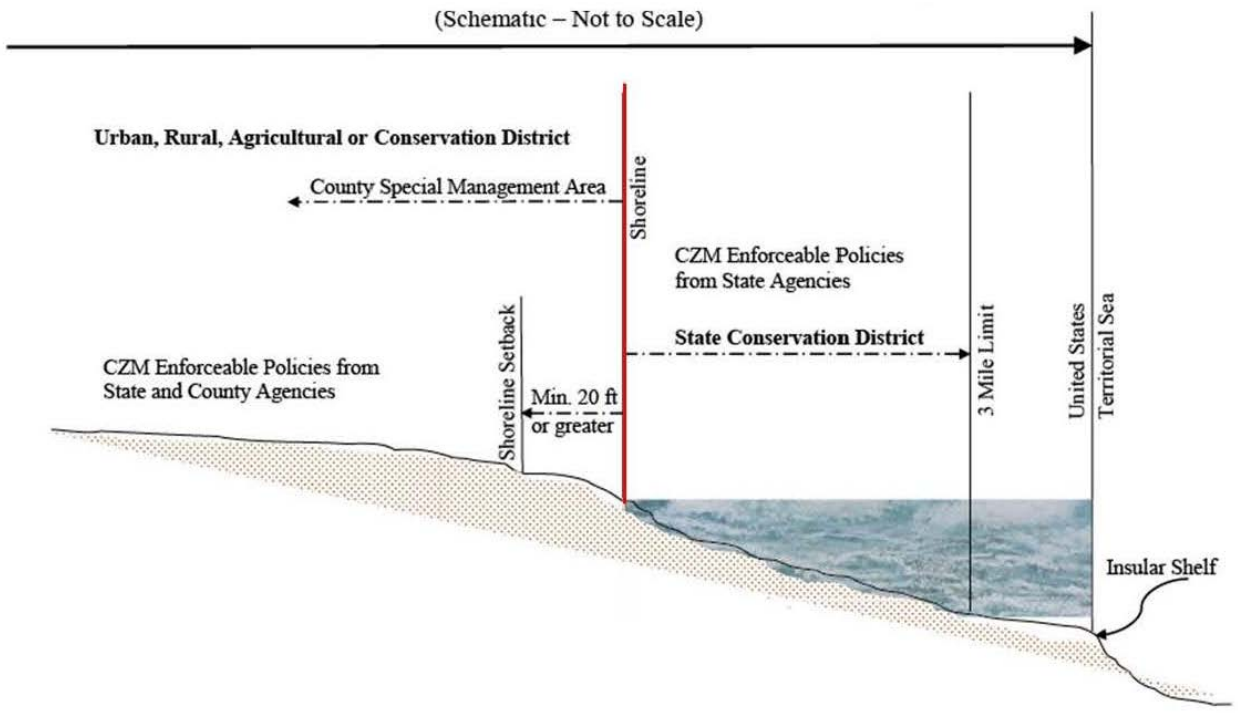

Figure 3-7. Hawai'i CZM Network- A Spatial Perspective
(Source: HI-OP 2015)

The Hawai'i Office of Planning administers HRS Chapter 205A, the Coastal Zone Management (CZM) law. The purpose of HRS Chapter 205A is to "*provide for the effective management, beneficial use, protection, and development of the Coastal Zone.*" The SMA permitting system is part of the CZM Program approved by Federal and State agencies. The SMA permitting system regulates all types of land uses and activities under a broad definition of "development" within the SMA. For an SMA permit approval the proposed action must be determined to be consistent with the CZM objectives and policies, and SMA guidelines or conditions (unless otherwise exempt). The SMA permit must precede any other permit authorization pertaining to a development within the SMA (HRS 205A 28 and 29). Some such SMA conditions may include:

- Provision of public shoreline access;
- Preservation of important archaeological sites;
- Building height restrictions;
- Boundary setback requirements to preserve coastal views from public access;
- Drainage improvements to mitigate flooding or to control siltation in coastal waters.

The project area mapped in relation to the SMA is presented in the below figure.

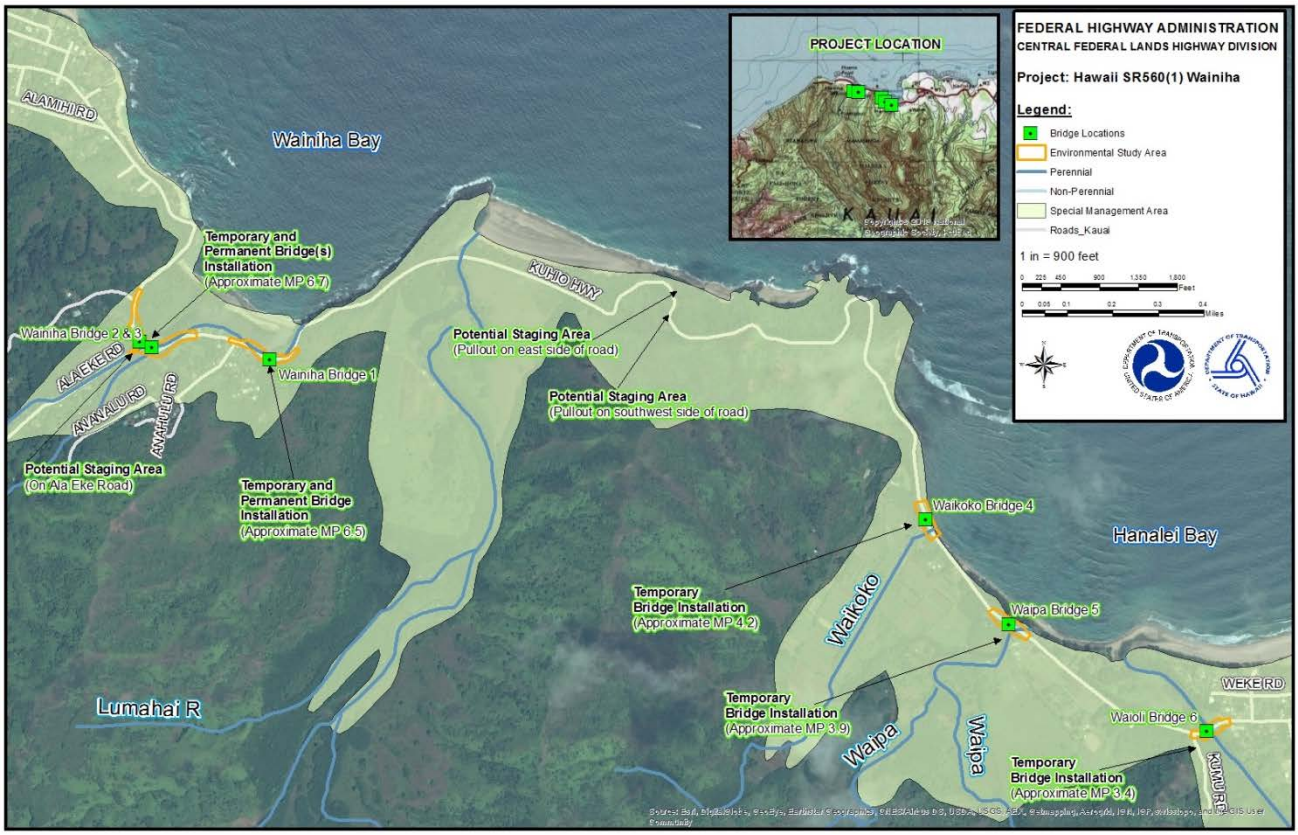

Figure 3-8. Project Site in Relation to Special Management Area

The shoreline setback boundaries have been established to conserve open space, minimize interference with natural shoreline processes; and minimize loss of improvements due to erosion (HRS § 205A-2(c)(9)(A)). The shoreline certification process was created to establish a baseline from which each County (utilizing its regulations) can measure the start of the "no build zone". This boundary is determined in the field utilizing survey techniques. The DNLR looks at the vegetation line and debris line along the shoreline though other types of evidence such as elevation, salt deposits, rock coloration, and other geomorphologic indicators,

biological indicators, neighboring shorelines, anecdotal evidence provided by people familiar with the area, and evaluation of seasonal wave run-up statistics and models may be utilized.

3.4.2 Affected Environment

All land in Hawai'i is located within the coastal zone. The County of Kaua'i has 19,212 acres in the SMA. Due to the existing location of Kūhiō Highway, the proposed project lies entirely within a SMA. Numerous CZM resources lie within the project vicinity. These resources include coastal resources; scenic resources, recreational resources and access, to name a few.

3.4.3 Environmental Consequences

3.4.3.1 No Action Alternative

Implementation of the No Action Alternative would result in a continuation of current roadway conditions and would not involve replacement of the temporary bridges. The existing temporary structures would remain and access within the area would be restricted to the existing condition. The No Action Alternative does not produce any changes to the existing roadway and thus would not result in any changes to the coastal zone.

3.4.3.2 Action Alternative

The proposed project would involve activities that meet the definition of "development" including the placement, construction, and removal of materials near the coastline, and has the potential to affect coastal resources. Throughout the project planning and development process, the proposed project has been designed to avoid and minimize impacts and ensure it is consistent with the CZM objectives and policies that are relevant to preserving the existing highway infrastructure. CFLHD will submit a Federal Consistency determination to the Office of Planning for its concurrence prior to requesting any other permit approvals for the project. Temporary impacts to CZM resources within the SMA are unavoidable under the Action Alternative. Below is a summary of each CZM resource and anticipated impacts

Recreational Resources. To provide coastal recreational opportunities accessible to the public and protect coastal resources uniquely suited for recreational activities that cannot be provided elsewhere.

Discussion: Permanent bridge replacements would occur over the Wainiha River on the boundary of the Wainiha Bay Beach Park (see section 3.14 for additional discussion). Temporary bridges in the Wainiha Bay Beach Park and over the Waikoko, Waipā, and Wai'oli streams would also occur. Kūhiō Highway provides the only access to this and other recreational resources located west of the project area. Only the Waikoko Bridge occurs on the shoreline, while Waipā and Bridge 1 are within the Kaua'i shoreline setback area (within 500 feet of the shoreline). Temporary impacts to recreational access would occur during road closures associated with detour construction and other construction related milestones. Following construction, improved access to recreational resources within the area would be expected. Minimal ROW impacts are anticipated. BMPs and mitigation measures have been implemented to protect quality of recreational resources within the project area. No permanent changes in access to coastal recreation opportunities are anticipated with the exception of improved reliability of access from the proposed project.

Historic Resources. To protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the CZM area that are significant in Hawaiian and American history and culture.

Discussion: Studies focusing on archaeology, historic architecture, and cultural perspectives were conducted for this project. To date HABS/ HAER documentation has been completed on the three Wainiha bridges. The North Shore section of the Kūhiō Highway is listed on the State and National Register of Historic Places. The temporary ACROW bridges are modern additions to the roadway and do not contribute to the road's significance. The proposed design would offer similar aesthetics and character of the historic pre-ACROW structures and therefore be an improvement to the visual setting of the NRHP-listed roadway. CFLHD

anticipates that the proposed project would not have an "adverse effect" on historic resources. See section 3.9 for additional discussion on historic properties within the project area.

Scenic and Open Space Resources. To protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Discussion: The project would be developed to ensure visual compatibility with the surrounding environment. No design components would alter natural landforms or existing public views within the project area. The bridge design elements including the bridge railing have been designed to mimic the original 1904 Wainiha bridges that existed prior to their replacement with temporary ACROW bridges. The permanent bridge locations have been designed to closely match the existing alignment. The Waikoko and Waipā temporary bridges occur within the shoreline setback, and impacts at these locations would be temporary in nature to facilitate construction of the Wainiha bridges. The proposed project would not negatively impact coastal scenic resources, nor is it anticipated to obstruct views of the landscape or open space resources.

Coastal Ecosystems. To protect valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems.

Discussion: The proposed project has been designed to minimize impacts to the coastal ecosystem. The project occurs within an SMA, over perennial river/stream(s), and would involve earthwork, grading, clearing and grubbing. Temporary work within the stream channel is anticipated during construction. However, because of the numerous and redundant mitigation measures and BMPs that would be implemented during construction to protect habitats, water quality and other coastal resources; the project would not have an adverse effect to coastal ecosystems.

Economic Uses. To provide public or private facilities and improvements important to the State's economy in suitable locations, and ensure that coastal dependent development such as harbors and ports, energy facilities, and visitor facilities are located, designed, and constructed to minimize adverse impacts in the coastal zone area.

Discussion: The project is not a coastal dependent development.

Coastal Hazards. To reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Discussion: The project is located in a tsunami evacuation zone and floodplain. The replacement structures would be designed to meet current engineering (AASHTO) standards, and applicable environmental regulations. The permanent structures would provide engineered bridges that are expected to improve roadway stability and public access over the Wainiha River and have an improved resiliency to storms than the existing structures.

Managing Development. To improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Discussion: Numerous permit approvals will be required to complete the proposed project, many of which contain a public participation component. CFLHD has ensured that the proposed action conforms with land use designations for the site. Extensive public coordination on the project occurred prior to the development of the Draft EA as discussed in section 7.2. Additional opportunities for the public to review and comment on the project would occur through the EA process. The project also likely qualifies as an SMA major permit, which may require an additional public hearing. CFLHD will consult with the HI Office of Planning and Kaua'i County during the SMA permitting process.

Public Participation. To stimulate public awareness, education, and participation in coastal management; and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM program.

Discussion: See Managing Development discussion, above.

Beach Protection. To protect beaches for public use and recreation, and locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements because of erosion.

Discussion: Bridges 2 and 3 are located outside the shoreline setback, while Bridge 1, Waikoko, and Waipā bridges are located within the setback. The Waipā and Waikoko bridges and the temporary relocation of Bridge 1 would be short-term development, lasting more than six months but no more than two years to facilitate construction of the permanent Wainiha bridges. The project would be designed with BMPs incorporated to protect the shoreline, and improvements coordinated with the county of Kaua'i. Bridge 1 would be a permanent structure to replace the existing temporary bridge and would be similar in size and location. The new structure would not necessitate the use of open space or recreation and would have improvement resiliency to coastal storms as compared to existing conditions. Minor noise disturbances would be anticipated at each of the bridge locations during construction, but there would be long-term effects to surrounding beach areas as the project would not involve an increase in traffic. Section 3.3 provides additional discussion on beach protection measures.

Marine Resources. To implement the State's ocean resources management plan.

Discussion: Although the project is not expected to affect marine resources directly, BMPs (as summarized in the water resources and biological resources sections) would be implemented to ensure the proposed action does not result in degradation of the aquatic environment, including the quality of State waters.

3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Mitigation is not required due to the lack of significant adverse impacts to the Coastal Resources from the action alternative. Avoidance, minimization, and mitigation measures summarized within sections 3.3, 3.8, and 3.11 would also avoid or minimize impacts to the coastal zone.

3.5 Natural Hazards

3.5.1 Affected Environment

3.5.1.1 Flooding

EO 11988 was passed in 1977 in furtherance of the National Flood Insurance Act of 1968 (NFIA), and the Flood Disaster Protection Act of 1973 (FDPA). The aim of this executive order is to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The term "floodplain" is defined as the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

If no floodplain impact is identified, the action may proceed without further consideration. If the agency determines that a proposed action is located in or would affect a floodplain, a floodplain assessment must be undertaken and included in the NEPA documentation. If there is no practicable alternative to locating in or affecting the floodplain, the agency must act to minimize potential harm to the floodplain. The agency also must act to restore and preserve the natural and beneficial values of floodplains as part of the analysis of all alternatives under consideration.

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.

- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

When available, flood hazard boundary maps created by the National Flood Insurance Program (NFIP) and flood insurance studies for the project area are used in order to determine the limits of the 100-year floodplain and the extent of encroachment. The Federal Emergency Management Agency (FEMA) and Federal Highway Administration (FHWA) guidelines have identified the base (100-year) flood as a flood of having a one-percent probability of being equaled or exceeded in any given year. The base floodplain is the area of a 100-year flood hazard within a given county or community. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount. FEMA has mandated that the projects can cause no rise in the regulatory floodway, and a one-foot cumulative rise for all projects in the base (100-year) floodplain.

FHWA-CFLHD has prepared a *Draft Final Hydraulics Report* for the project that identified the existing hydrologic and hydraulic conditions in the project area, analyzed the effects of the proposed project on the existing floodplain limits, and provided recommendations for the proposed bridge design (FHWA 2016b).

The Wainiha Bridges are fully located within Zone VE, which is a FEMA-mapped floodplain and extends to a point approximately 1,000 feet upstream of Bridge 3. From there, the flood hazard zone changes to AE with a designated floodway. Zone VE is defined as a coastal flood zone with velocity hazard (wave action) and base flood elevations determined. Bridge 1 is in FEMA Zone VE with a hazard elevation of 27 feet, and Bridges 2 and 3 are in FEMA Zones VE with a hazard elevation of 21 feet. The effective Flood Insurance Study (FIS) was based on hydraulic models that are not available; therefore, new models were developed for existing and proposed conditions in order to demonstrate the effects of the proposed project on the Wainiha River within the VE Zone. The USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) version 4.1, 2010 software was used to analyze the existing hydraulic conditions.

The hydrologic design for the new Wainiha bridges is based on the 1-in-100-year storm event and applicable FHWA Hydraulic Engineering Circulars, and based on the Kūhiō Highway classification as an arterial.

3.5.1.2 Seismic Activity

Earthquakes in the Hawaiian Islands are primarily associated with volcanic eruptions from the expansion or shrinkage of magma reservoirs, rather than shifts in the earth's crust. The island of Kaua'i is periodically subject to episodes of seismic activity of varying intensity, but available historical data indicates that the number of major earthquakes occurring on Kaua'i have generally been fewer and of lower intensity compared with other islands, such as the Big Island.

The AASHTO LRFD Bridge Design Specifications (2014) provide minimum design criteria to address potential damages from seismic disturbances. The recommended seismic response parameters for use in design represent ground motion corresponding to an exceedance probability of approximately 7 percent in 75 years for an earthquake with an approximate 1,000-year return period. The AASHTO LRFD Bridge Design Specification scale is from Seismic Zone 1 through 4, where 1 is the lowest level for potential seismic induced ground movement. Kaua'i is designated Seismic Zone 1.

3.5.1.3 Tsunami

Tsunamis potentially destructive to the Hawaiian Islands may originate anywhere around the rim of the

Pacific Ocean and may also be locally generated by earthquakes on or near the island. Approximately 50 tsunamis have been reported in the Hawaiian Islands since the early 1800s. The State of Hawai'i Civil Defense established tsunami inundation zones and maps for all coastal areas in Hawai'i. The Wainiha Bridges are located within the tsunami evacuation zone. Two major tsunamis have impacted the Wainiha area and have resulted in major damage or destruction of the historic Wainiha bridges. The two most severe tsunamis to hit the Wainiha area occurred in 1946 and 1957 and resulted in loss of life and extensive property damage.

3.5.2 Potential Impacts

3.5.2.1 No Action Alternative

Implementation of the No Action Alternative would result in a continuation of current conditions and would not involve replacement of the temporary bridges. The No Action Alternative does not produce any changes to the existing ACROW bridges or roadway and thus would not result in any changes to the existing floodplain or base flood elevation. The condition of the existing foundations is unknown and unable to be evaluated, but can reasonably be assumed to not meet current seismic design recommendations. This condition would continue into the future.

3.5.2.2 Action Alternative

The proposed project is not constrained by geological and topographic site conditions, nor would it affect any unique geological formations. Construction materials include clean gravel and well-graded granular structural fill as backfill for excavations. To address the presence of soft subgrade soils found in geotechnical investigations and the potential for settlement, deep foundations would be installed.

Construction of the bridges, temporary bypasses, and immediate roadway approaches would involve land disturbance that could result in soil erosion. However, the erosion potential is relatively low given the small area of disturbance and the affected soil types, which have a lower erosion hazard (USDA 1972). To minimize the potential for construction-related erosion impacts, best management practices (BMPs) would be developed as part of the project's engineering and design in accordance with the Kaua'i County Code for grading, grubbing, and stockpiling (Kaua'i County Code, Chapter 22, Article 7). See section3.2, Climate and Air Quality, and section 3.3, Water Resources, for a list of applicable BMPs.

Due to the project's location in the regulatory floodplain, the project constitutes an encroachment. The new bridges would be designed to meet or exceed existing conditions. Hydraulic analyses modeled for the proposed bridges have indicated that there would be no rise in the base flood elevation from existing conditions. Therefore, there would be no significant encroachment and no adverse effects to flooding potential. FHWA-CFLHD would continue coordination with the County of Kaua'i, which is the local floodplain administrator.

In addition, the new Wainiha bridges would also be designed to withstand the forces causes by wave action, consistent with the AAASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms (2008). The new bridges would therefore be more resilient to tsunamis than the existing structures, and would be an improvement over the No Action Alternative. Lastly, the bridges are also being designed to the appropriate seismic response parameters and would be more resistant to damage from potential seismic events than the existing structures.

3.5.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts of the Action Alternative to topography, geology, and soils are less than significant and do not require specific mitigation measures. The project would be designed appropriately for site conditions in accordance with the 2014 AASHTO LRFD Bridge Design Specifications, Seventh Edition (AASHTO 2014).

3.6 Noise

3.6.1 Affected Environment

For highway transportation projects with FHWA involvement, federal regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. Under 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type III project is a project that does not meet the classifications of a Type I or Type II project.

This project to replace the Wainiha temporary bridges does not meet the classification of a Type 1 or Type II project; therefore, noise abatement criteria is not discussed further.

The project area is rural with scattered residential development. The noise environment is predominantly influenced by automobile traffic noise along Kūhiō Highway. Existing noise measurements were not obtained due to a Traffic Noise Model not being required; however background noise levels for this type of setting can be assumed to be approximately 45 to 50 A-weighted decibels (dBA), with slight increases when traffic passes and crosses over the steel bridges (EPA 1978). This is considered a quiet environment.

Figure 3-9 depicts the noise levels of common activities to enable readers to compare the levels discussed in this section with common activities.

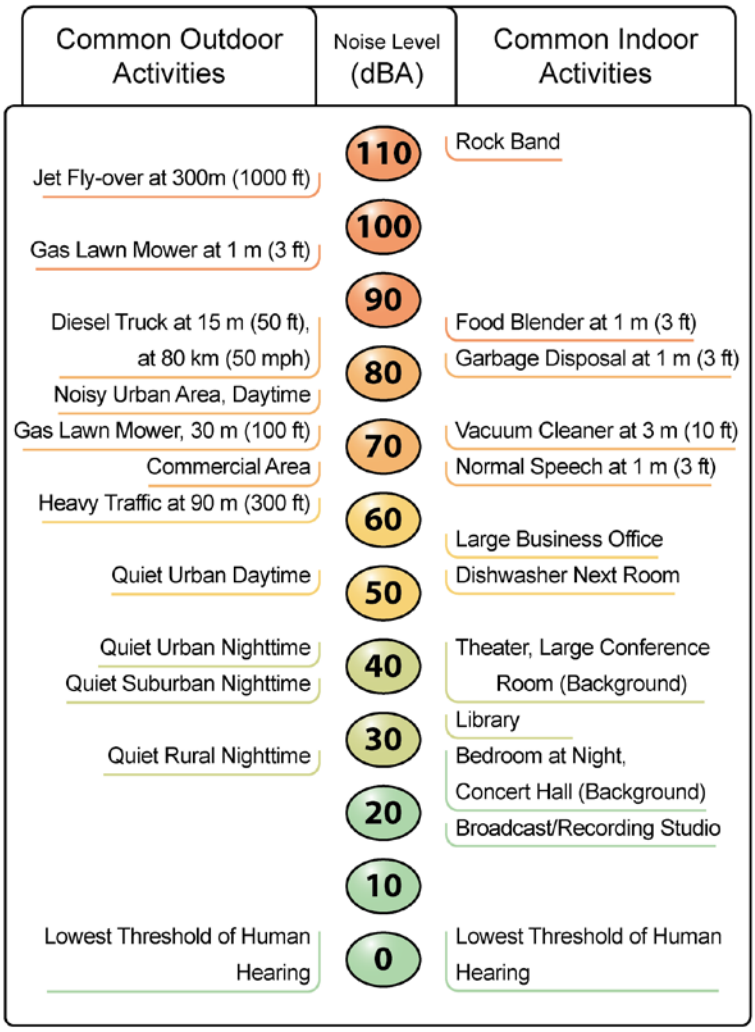

Figure 3-9. Noise Levels of Common Activities

3.6.2 Potential Impacts

3.6.2.1 No Action Alternative

Under the No Action Alternative, no permanent improvements to the bridges or roadway would occur and current maintenance activities would continue. There would be no noise impacts associated with this alternative.

3.6.2.2 Action Alternative

Construction-related Noise

Construction noise impacts are unavoidable, but would be temporary. Noise levels produced during construction would be a function of the methods employed during each stage of construction. Equipment likely to be used include, but is not limited to, drill rig, crane, excavator, backhoe, front-end loader, grader, forklift, semi-trucks, dump trucks, concrete trucks, compactors, paving equipment, and compressors. *Roadway Construction Noise Model User's Guide* (FHWA 2006) indicates that the loudest equipment generally emits noise in the range of 80 to 90 decibels (dBA) at a distance of 50 feet. If sheet pile coffer dams are used to isolate in-water work activities, the short-term installation of the piles may be the loudest construction activity to occur and could exceed 90 dBA. While construction noise activities would be bothersome to nearby residents over the short-term, there are no immediately adjacent commonly used recreation areas, churches, schools or other similar uses that would be disrupted by temporary noise

increases. Undeveloped beach parks, including Wainiha Bay Beach Park and the unnamed beach area adjacent to the Waikoko Bridge and not commonly used due to dangerous tide conditions. However, if used, the ocean sounds would help to buffer any noise from the construction site. Table 3-9 presents standard construction equipment typically used on highway construction jobs and the noise attenuation, or the noise reduction that can generally be expected over distances from the source. As shown in the below table, construction noise generally attenuates to background levels in about 800 feet when there is no vegetation buffering. Noise would be most bothersome to residences closest to each bridge, and levels would attenuate as the distance from each bridge increases. Presence of mature vegetation in the project area would help to further attenuation.

TABLE 3-9
Noise Attenuation (Point Source) for Standard Construction Equipment

Equipment Type	Impact Device (Y/N)	Actual Measured Average Lmax (dBA) at 50 ft	Noise Attenuation (Point Source)				
			Lmax (dBA) at 100 ft	Lmax (dBA) at 200 ft	Lmax (dBA) at 400 ft	Lmax (dBA) at 800 ft	Lmax (dBA) at 1600 ft
Backhoe	No	78	70.5	63	55.5	48	40.5
Chain Saw	No	84	76.5	69	61.5	54	46.5
Compressor (air)	No	78	70.5	63	55.5	48	40.5
Concrete Mixer Truck	No	79	71.5	64	56.5	49	41.5
Concrete Pump Truck	No	81	73.5	66	58.5	51	43.5
Concrete Saw	No	90	82.5	75	67.5	60	52.5
Crane	No	81	73.5	66	58.5	57	43.5
Drill Rig Truck	No	79	71.5	64	56.5	49	41.5
Excavator	No	81	73.5	66	58.5	51	43.5
Front End Loader	No	79	71.5	64	56.5	49	41.5
Grader	No	85	77.5	70	62.5	55	47.5
Tele Lift	No	75	67.5	60	52.5	45	37.5
Mounted Impact Hammer (hoe ram)	Yes	90	82.5	75	67.5	60	52.5
Pickup Truck	No	75	67.5	60	52.5	45	37.5
Rock Drill	No	81	73.5	66	58.5	51	43.5
Scraper	No	84	76.5	69	61.5	54	46.5

Source: FHWA's Roadway Construction Model Database (2005) and FHWA Construction Noise Handbook (2006)

Much of the project area is located in the Class A Zoning District (open space), where "maximum permissible sound levels" are 55 dBA during the daytime (7 am to 10 pm) and 45 dBA during the nighttime (10 pm to 7

am), as defined in HAR §11-46-3. Construction noise is expected to exceed the State's "maximum permissible" property line noise levels, and a Community Noise Permit would be necessary and obtained from HDOH under HAR Chapter 11-46, Community Noise Control. For HDOH to issue a noise permit, the application would describe construction activities for the project. Specific permit restrictions required for construction projects includes the following:

- No permit shall allow construction activities that exceed the maximum permissible sound levels before 7 am and after 6 pm of the same day.
- No permit shall allow construction activities that emit noise in excess of 95 dBA except between 9 am and 5:30 pm of the same day.
- No permit shall allow construction activities that exceed the allowable noise levels on Sundays and on certain holidays. Pile driving and other activities exceeding 95 dBA would be prohibited on Saturdays.

The HDOH noise permit generally does not limit the noise level generated at the construction site, but rather the times at which high-volume construction can take place. However, before issuing the permit, HDOH may require noise mitigations to be incorporated into construction plans, for example, maintenance and proper muffling of construction equipment and onsite vehicles that exhaust gas or air. HDOH may also require the contractor to conduct noise monitoring. In addition to the noise permit, a noise variance may be requested from HDOH for specific occasions when work hours need to be extended into the evenings and/or on weekends to implement the overall construction schedule.

Long-term Noise Impacts

The Action Alternative would not change highway capacity, traffic counts or operational conditions (that is, the posted speed limit). Therefore, noise levels after the project is completed are expected to be unchanged.

3.6.3 Avoidance, Minimization and/or Mitigation Measures

No long-term noise impacts would be associated with the project. Short-term impacts would be less than significant with incorporation of minimization and mitigation measures. A Community Noise Permit would be obtained, and all provisions would be complied with. In addition to the noise permit, a noise variance may be requested from HDOH for specific occasions when work hours need to be extended into the evenings and/or on Sundays to implement the overall construction schedule.

Additional BMPs to minimize construction related noise would include, but are not limited to, the following:

- The project team would coordinate with local residents and businesses to inform them of the construction schedule, and when loud construction activities can be expected.
- Enforcement of HDOH occupational noise exposure regulations would be the responsibility of the construction contractor. If workers experience noise exceeding HDOH standards, administrative or engineering controls would be implemented. Use of personal protective equipment such as earplugs or muffs may also be required.
- To reduce nearby residential noise exposure, construction activities would be conducted during normal working hours to the extent possible. For any work that would occur after normal working hours (that is, on weekends), or if permissible noise levels are exceeded, appropriate permitting and monitoring as well as development and implementation of administrative and engineering controls would be employed.
- The contractor is responsible for minimizing noise by properly maintaining noise mufflers and other noise-attenuating equipment, and maintaining noise levels within regulatory limits.

3.7 Hazardous Materials

This section identifies locations of known regulated materials so they can be avoided or their impacts minimized. Regulated materials are substances or materials, including hazardous substances and materials that have been determined by the Environmental Protection Agency (EPA) to be capable of posing an unreasonable risk to health, safety, and property. Examples of regulated materials include asbestos, lead-based paint, heavy metals, and petroleum hydrocarbons (e.g., gasoline and diesel fuels), which could be harmful to human health and the environment. Regulated materials may exist within the study area, which includes an approximate 0.5 mile radius surrounding the bridge locations, at facilities that generate, store, and dispose of these substances, or at locations of past releases of these substances.

3.7.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The Resource Conservation and Recovery Act provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

The Hawai'i Department of Health (HDOH) received delegation of its hazardous waste program in 1999, and is regulated under the DOH Title 11, Chapter 260 (Hazardous Waste Management, General Provisions) of the Hawai'i Administrative Rules. This provision defines hazardous waste and addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

3.7.2 Affected Environment

The land use within the study area consists of agricultural, undeveloped, or residential properties. A cursory review of the potential for the presence of hazardous materials was performed by reviewing photos taken from site visits, publicly accessible databases, and historic aerials and topographic maps to document the occurrence of potential recognized environmental conditions (RECs), as defined by the American Society for

Testing and Materials (ASTM) E1527-13 *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. RECs are defined as the presence or likely presence of hazardous substances, hazardous waste, or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any such substances into structures on the property or into the ground, groundwater, or surface water. The term REC is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment, and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

A review of the EPA's Envirofacts database identified nine facilities within the project study area. No compliance issues were noted with regard to the listed facilities. In addition, FHWA-CFLHD reviewed the HDOH's listing of registered and leaking underground storage tank (UST) and aboveground storage tank (AST) for registered facilities within the study area. No listed facilities were noted within the study area. The database review did not identify RECs within the study area.

During a review of photographs taken during a site visit and aerial photographs, numerous small pole-mounted transformers were observed adjacent to the project areas. No apparent leaks or evidence of releases were identified within the photos. The presence of transformers in apparently good condition does not present a REC to the study area.

Agricultural properties were noted within the study area. Although the surrounding properties have been utilized for agricultural purposes, no evidence of storage, mixing, excessive use, or apparent misuse of agricultural chemicals was noted during the review. None of the surrounding properties were identified on the databases reviewed for releases of agricultural chemicals. Therefore, the aforementioned finding does not constitute a REC because no obvious releases were identified during the review.

3.7.3 Potential Impacts

3.7.3.1 No Action Alternative

The No Action Alternative would have no impact on potential hazardous waste sites in the project area since this alternative would not involve construction. RECs are not expected to affect ongoing maintenance activities or introduce hazardous materials into the project area.

3.7.3.2 Action Alternative

Based on the environmental database research, review of historic maps, aerial photographs and site photographs, no RECs were identified within the study area. Therefore, no hazardous materials are anticipated to be encountered. In the unlikely event hazardous materials are encountered, stop-work provisions would be included in the contract and coordination with the appropriate state and local authorities would occur.

Construction-related activities would require use of hazardous materials, including lubricants of various weights and viscosities, hydraulic fluid for transit and construction equipment, and cleaning products, and materials used for corrosion protection such as paint or other coatings on exposed steel.

3.7.4 Avoidance, Minimization, and/or Mitigation Measures

Impacts related to hazardous materials would be less than significant. The following measures would be implemented to avoid or minimize the potential for effects.

- A hazardous materials spill plan would be developed that describes spill prevention measures regarding the location of refueling and storage facilities and the handling of hazardous materials. The hazardous materials spill plan would describe actions to be taken in case of a spill. The contents and requirements of the hazardous materials spill plan include the following:
    - The project manager and heavy equipment operators would perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations would be postponed or

halted should a leak be detected, and they would not proceed until the leak is repaired and the equipment is cleaned.
    - Absorbent material manufactured for containment and cleanup of small hazardous materials spills would be kept at the project site.
- In the event of a large hazardous materials spill or if unanticipated hazardous materials are encountered within the project site, the HDOH Hazard Evaluation and Emergency Response Office and the HDOT Hazard Evaluation and Environmental Response Office would be contacted immediately.

3.8 Plants and Animals

3.8.1 Affected Environment

SWCA Environmental Consultants conducted field reconnaissance surveys between September 29 and October 2, 2014 and prepared a Biological Resources Survey Report for the project. This report is provided in Appendix D and its information is summarized in this EA. Representative portions of the area were driven or walked to describe vegetation types, fauna, and wetlands or streams, as well as known or suspected threatened, endangered, proposed or candidate wildlife or plant species and habitat.

SWCA also reviewed available scientific and technical literature regarding natural resources in and near the survey area and action area. This literature review encompassed a thorough search of refereed scientific journals, technical journals and reports, environmental assessments and environmental impact statements, relevant government documents, and unpublished data that provide insight into the natural history and ecology of the area. SWCA also reviewed available geospatial data, aerial photographs, and topographic maps of the survey area and action area (SWCA 2015b).

3.8.1.1 Plants[4]

No Federally or State-listed threatened, endangered, or candidate plant species were recorded in the survey area. The survey area does not contain critical habitat for threatened or endangered plants. Six native Hawaiian plants—*Cyperus polystachyos*, hala (*Pandanus tectorius*), hau (*Hibiscus tiliaceus*), kou (*Cordia subcordata*), nanea (*Vigna marina*), and naupaka (*Scaevola taccada*)—were seen during the survey[5]. These species are indigenous, or are found in Hawai‘i and elsewhere. None of these species are considered rare (Wagner et al. 1999).

The vegetation in the survey area is composed of five main vegetation types: 1) ruderal vegetation, 2) emergent wetland, 3) hau thicket, 4) mixed non-native forest, and 5) ornamental landscaping. Ruderal vegetation occurs in and along the highway right-of-way and in heavily disturbed areas. Emergent wetland is present adjacent to streams and is dominated by a dense mat of the non-native California grass (*Urochloa mutica*). Hau thicket also occurs adjacent to standing water; it is characterized by a dense stand of hau trees. The mixed non-native forest is composed of a mix of non-native trees and herbaceous understory. Ornamental landscaping is common adjacent to houses and buildings, where trees and shrubs are planted or lawns maintained. The vegetation in each bridge survey area is described in further detail below.

Wainiha Bridge 1

The vegetation types within the Wainiha Bridge 1 survey area are ruderal vegetation, mixed non-native forest, hau thicket, and ornamental landscaping. The hau thicket and mixed non-native forest are present on the *mauka* side of the bridge immediately adjacent to the stream. The mixed non-native forest is

[4] The plant names used in this assessment follow Wagner et al. (2012), Wagner and Herbst (2013), and Wagner et al. (1999).

[5] The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999), Wagner and Herbst (2003), and Staples and Herbst (2005). Recent name changes are those recorded in Wagner et al. (2012). Common/Hawaiian names are provided first, followed by scientific names in parenthesis. If no common or Hawaiian name is known, only the scientific name is provided.

characterized by large, spreading false kamani trees, with only a few scattered seedlings and laua'e fern in the understory. The ruderal vegetation occurs in and along the highway right-of-way and in heavily disturbed areas (Figure A4). The water's edge is dominated by umbrella sedge and California grass. On the flatter, drier areas, this vegetation type is largely composed of elephant grass, wedelia, Guinea grass, Dallis grass, and short koa haole. *Neonotonia wightii*, maunaloa vine, and moon flower (*Ipomoea alba*) are climbing in trees and over shrubs. Ornamental trees and shrubs are planted adjacent to houses, including ti, hibiscus (*Hibiscus* spp.), Turk's cap (*Malvaviscus penduliflorus*), and beefsteak plant (*Acalypha wilkesiana*). Mowed lawns of wide-leaved carpetgrass and Bermuda grass (*Cynodon dactylon*) are interspersed with weedy grasses and low-growing herbaceous such as tick trefoil (*Desmodium triflorum*) and creeping indigo (*Indigofera spicata*).

Wainiha Bridge 2 & 3

The most dominant vegetation types in the Wainiha Bridges 2 & 3 survey area are emergent wetland and hau thicket. The emergent wetland is a dense mat of non-native California grass. It occurs in the portions of the survey area immediately adjacent to Wainiha Stream (Figure A5). Few other species occur in this mat, although Guinea grass, umbrella sedge, and Job's tears (*Coix lachryma-jobi*) are widely scattered. Hau thickets also cover large portions of the survey area. The most common grasses and herbaceous species found in the ruderal vegetation type in the Wainiha Bridges 2 & 3 survey area are basketgrass, wedelia, Guinea grass, California grass, Hilo grass, honohono (*Commelina diffusa*), and Spanish needle (*Bidens alba*) (Figure A6). Seedlings of koa haole, java plum, African tulip (*Spathodea campanulata*), and octopus tree (*Schefflera actinophylla*) are sparsely scattered within the right-of-way. Large false kamani trees are also in the survey area, often covered in climbing taro vines. Several other vines are present, including taro vine, maunaloa, *Neonotonia wightii*, and white thunbergia (*Thunbergia fragrans*). Pai'i'ihā (*Cyclosorus dentatus*) and young Chinese fan palm (*Livistona chinensis*) are common in the understory. Ornamental species planted in the survey area include white ginger (*Hedychium coronarium*), coconut trees, hala, hibiscus, snowbush (*Breynia disticha*), kukui (*Aleurites moluccana*), and *Acalypha* spp.

Wai'oli

Four vegetation types are present at the Wai'oli Bridge survey area: ruderal vegetation, ornamental landscaping, emergent wetland, and hau thicket. On the *makai* side of the bridge, the vegetation is dominated by ornamental landscaping, which is characterized by manicured lawns of wide-leaved carpetgrass (*Axonopus compressus*), interspersed with herbaceous plants (Figure A1 in Appendix report). Ornamental plantings adjacent to residences on both sides of the bridge include Areca palm (*Dypsis lutescens*), mango (*Mangifera indica*), red ginger (*Alpinia purpurata*), ti (*Cordyline fruticosa*), and torch ginger (*Etlingera elatior*). Taro vine (*Epipremnum pinnatum*) is climbing on several trees, and umbrella sedge (*Cyperus involucratus*) is present along the stream's edge. On the *mauka* side, a dense mat of the non-native California grass is present on the western side of the stream. Ruderal vegetation occurs along the highway right-of-way and is primarily dominated by wedelia (*Sphagneticola trilobata*), Hilo grass (*Paspalum conjugatum*), java plum (*Syzygium cumini*), and giant reed (*Arundo donax*). The indigenous hau also forms small dense stands along the stream on both sides of the highway.

Waipā

At the Waipā Bridge survey area, the vegetation is dominated by a dense hau thicket on both sides of the bridge (Figure A2 in Appendix report). Little to no other plants occur in this vegetation type. Along the stream's edge, in areas where hau is not present, umbrella sedge and California grass are common. The ruderal vegetation type at Waipā is dominated by Hilo grass, Guinea grass (*Urochloa maxima*), wedelia, elephant grass (*Cenchrus purpureus*), West Indian dropseed (*Sporobolus indicus*), and basketgrass (*Oplismenus hirtellus*). Maunaloa (*Canavalia cathartica*) is climbing throughout. Ironwood trees (*Casuarina equisetifolia*) and false kamani (*Terminalia catappa*) are also present, primarily on the *makai* side of the bridge. The native kou (*Cordia subcordata*) is planted just along the edge of the survey area near the recreation area.

Waikoko

The vegetation types in the Waikoko Bridge survey area are ruderal vegetation, mixed non-native forest, hau thicket, and ornamental landscaping. Hau thickets (Figure A1) are present on the *mauka* side of the bridge, adjacent to standing water. The mixed non-native forest is dominated by ironwood trees (*Casuarina equisetifolia*) and large false kamani trees that create a dense canopy. Taro vine, maunaloa, and maile pilau (*Paederia foetida*) are climbing over trees, and patches of laua'e fern (*Phymatosorus grossus*) are present in the understory. The most common species in the ruderal vegetation along the highway are wedelia, wide-leaved carpetgrass, Guinea grass, Hilo grass, Dallis grass (*Paspalum dilatatum*), narrow-leaved plantain (*Plantago lanceolata*), and short-stature koa haole (*Leucaena leucocephala*) (Figure 4). Naupaka, ti, hala, and coconut trees (*Cocos nucifera*) are planted in the survey area. The native *Cyperus polystachyos* and nanea (*Vigna marina*) were also seen at this survey area.

3.8.1.2 Wildlife

Faunal, or animal, surveys consisted of a pedestrian survey *before* 11 am or *after* 4 pm when wildlife was most likely active. Field observations of birds were conducted using 8 × 30–mm binoculars. Visual and auditory observations were included in the survey. All observed birds, mammals, reptiles, amphibians, fish, and invertebrate species were noted during the survey.

Acoustic surveys for the endangered Hawaiian hoary bat or 'ōpe'ape'a (*Lasiurus cinereus semotus*) were not conducted; however, areas of suitable habitat for foraging and roosting were noted when present.

Instream surveys (i.e., mask and snorkel) were not conducted by SWCA because heavy rains on September 29 resulted in high turbidity and low visibility. Aquatic species were visually observed from the surface. The description of aquatic species is supplemented with information from previous known stream surveys.

The following section describes common wildlife observed during the September and October 2014 field surveys.

Birds

In all, 16 bird species were documented during the survey by SWCA (Table 3-10). Of these, four are federally and state listed: Hawaiian gallinule, Hawaiian coot, Hawaiian duck, and Hawaiian goose or nēnē. Endangered Hawaiian stilt are also likely to occur. Other birds observed during the survey are typical of coastal areas on Kaua'i.

Hawaiian gallinule were seen during the survey, and one resident reported seeing Hawaiian gallinule nests throughout the year near at Wai'oli Bridge. Hawaiian gallinule were also observed foraging near Wainiha Bridges 2 & 3. Nesting Hawaiian coot were observed at Wainiha Bridge 1. Residents near Wainiha Bridge 1 have seen all four listed waterbirds species (Hawaiian gallinule, Hawaiian coot, Hawaiian duck, and Hawaiian stilt) near the bridge. Hawaiian ducks flew over Wainiha Bridge 2 & 3 during the surveys. No listed waterbirds were observed at the Waipā or Waikoko Bridges.

Hawaiian gallinule, Hawaiian coot, and Hawaiian ducks could be present at any of the bridges at any time and could be breeding in or near the survey area. Breeding for these species is not restricted to a particular season. Hawaiian stilt could also be present in any areas with shallow water. Most of the streambank slopes near the bridges are steep, though shallow water areas (preferred habitat for stilt) are present in sections. Thus, Hawaiian stilt may also occasionally be present.

Nēnē were only seen at one bridge survey area; a small flock of nēnē flew overhead at Wai'oli Bridge. Nēnē could also occasionally browse in the vegetation along the banks and in the ruderal vegetation.

TABLE 3-10
Birds Observed by SWCA in and near the Survey Area

Common Name	Scientific Name	Status*

Black-crowned night heron	*Nycticorax nycticorax*	E
Cattle egret	*Bubulcus ibis*	NN
Common myna	*Acridotheres tristis*	NN
Domestic chicken	*Gallus gallus*	NN
Hawaiian coot	*Fulica alai*	E, End
Hawaiian duck	*Anas wyvilliana*	E, End
Hawaiian gallinule	*Gallinula galeata sandvicensis*	E, End
House finch	*Haemorhous mexicanus*	NN
Hwamei	*Garrulax canorus*	NN
Japanese white-eye	*Zosterops japonicus*	NN
Nēnē	*Branta sandvicensis*	E, End
Northern cardinal	*Cardinalis cardinalis*	NN
Nutmeg mannikin*	*Lonchura punctulata*	NN
Pacific golden-plover	*Pluvialis fulva*	M
Spotted dove	*Streptopelia chinensis*	NN
Zebra dove	*Geopelia striata*	NN
	Total species	**16**

Notes:
Status: E = Endemic, NN = non-native established species, M = migrant; End = Endangered.

Seabirds, particularly the endangered Hawaiian petrel, threatened Newell's shearwater, and proposed band-rumped storm-petrel, may fly over the survey area at night while travelling to and from their upland nesting sites to the ocean. These species nest inland in the mountainous interior of Kaua'i (Ainley et al. 1997; Mitchell et al. 2005). No suitable nesting sites for these species are present in the survey area.

Other migratory bird species that could occur in the survey area include the sanderling (*Calidris alba*), ruddy turnstone (*Arenaria interpres*), and wandering tattler (*Tringa incana*).

Mammals

A dog (*Canis familiaris*) was observed during the survey, and cat (*Felis catus*) are also likely to enter the area due to the nearby residences. Other mammals that can be expected in the survey area include mouse (*Mus musculus*), and rat (*Rattus* spp.).

Terrestrial Invertebrates

Two species of terrestrial invertebrates were noted during the survey: the non-native giant African snail (*Achatina fulica*) and the native indigenous globe skimmer (*Pantala flavescens*).

Freshwater and Estuarine Communities

Although SWCA did not conduct instream surveys due to heavy rains, earlier surveys conducted within the streams are summarized by the Hawai'i Division of Aquatic Resources (DAR) (Parham et al. 2008a). Table 5 in Appendix D lists the stream species recorded in the Wainiha, Wai'oli, and Waipā watersheds by the Hawai'i DAR Watershed Atlas (Parham et al. 2008). All five native species of 'o'opu, the two native 'ōpae, and three native species of snails have been recorded in Wainiha Stream (see Table B in Appendix D). Wai'oli Stream contains at least two 'o'opu species and the two native 'ōpae. Waipā Stream contains at least one 'o'opu species and the two native 'ōpae. Of the native species DAR lists as occurring in the three streams, the

following are likely to occur in the survey area because they are estuarine: āholehole (*Kuhlia* spp.), ʻoʻopu akupa (*Eleotris sandwicensis*), ʻŌpae ʻoehaʻa (*Macrobrachium grandimanus*), ʻoʻopu naniha (*Stenogobius hawaiiensis*), pipiwai (*Theodoxus cariosus*), and hapawai (*Theodoxus vespertinus*). Amphidromous species, or those that migrate between fresh and salt water at different life cycles other than breeding, may also migrate through the survey area.

No sampling results are provided for Waikoko Stream by Parham et al. 2008; however, during SWCA's surveys, āholehole (*Kuhlia* spp.) and tilapia (*Oreochromis* sp./ *Sarotherodon* sp.) were observed from the water's edge at the Waikoko estuary.

Marine Communities

The Wainiha and Hanalei Bays and shorelines in or adjacent to the survey area contain habitats that may support algae, coral, invertebrates, fish, sea turtles, and monk seals.

Wainiha Bay

The Wainiha Bridge 1 and Wainiha Bridges 2 & 3 survey areas are approximately 300 m (1,000 feet) and 122 m (400 feet) upstream from the mouth of the Wainiha Stream, respectively. Most of Wainiha Bay is mapped as unknown habitat by NOAA. The shoreline intertidal area of Wainiha Bay just outside the mouth of the stream is classified as sand/unconsolidated sediment, and the shoreline intertidal along the southern portion is classified as hardbottom, uncolonized volcanic rock/boulders (Coyne et al. 2003). NOAA Nautical Charts report a coral reef on the northwestern portion of Wainiha Bay, roughly 171 m (560 feet) from the stream mouth (NOAA Nautical Charts 2002).

According to University of Hawaiʻi at Mānoa researchers, sharks and strong currents just outside the mouth of the Wainiha Stream have prevented many marine studies in that area (personal communication, Alan Friedlander, University of Hawaiʻi at Mānoa, April 2015). However, biologists from NOAA's Coral Reef Ecosystem Division did conduct a survey in Wainiha Bay in May 2013 in response to a potential coral disease, specifically focusing on *Montipora patula*. Although this survey was conducted more than 300 m (1,000 feet) from the shoreline, it did document a relatively high percentage of coral in the bay compared to other sites on Kauaʻi (personal communication, Bernardo Vargas-Angel, NOAA, May 3, 2015).

Hawaiian monk seal sightings have been reported at Wainiha Bay (personal communication, Tracy Mercer, NOAA, August 19, 2015). More detailed information is currently being obtained from NOAA. The final rule for the revised designated critical habitat for Hawaiian monk seal became effective September 21, 2015 (NOAA 2015). In the main Hawaiian Islands, the critical habitat includes six specific areas; these include marine habitat from the 200-m depth contour line (including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor) through the water's edge, and the terrestrial environment to 5 m (15 feet) inland from the shoreline between identified boundary points on the Islands of Kaʻula, Niʻihau, Kauaʻi, Oʻahu, Kahoʻolawe, Lanaʻi, Maui, Molokaʻi, and Hawaiʻi (NOAA 2015).

Two terrestrial and one marine essential feature have been identified for the Hawaiian monk seal critical habitat:

- Terrestrial areas and the adjacent shallow sheltered aquatic areas with characteristics preferred by Hawaiian monk seals for pupping and nursing.
- Marine areas from 0 to 200 m (0 to 656 feet) in depth that support adequate prey quality and quantity for juvenile and adult Hawaiian monk seal foraging.
- Significant areas used by Hawaiian monk seals for hauling out, resting, or molting.

Although Wainiha Bay and the shoreline are considered critical habitat for the Hawaiian monk seal, the Wainiha Bridge 1 and Wainiha Bridges 2 & 3 survey areas are outside the recently designated critical habitat.

The threatened green sea turtle and hawksbill sea turtle were not observed during the biological survey and have not been recorded by NOAA-Pacific Islands Fisheries Science Center as basking or nesting in Wainiha Bay (Parker et al. 2005); however, these animals may be found foraging in marine waters of Wainiha Bay, or potentially hauling out or basking on the beach.

Hanalei Bay

The benthic composition of Hanalei Bay, which Waipā, Waiʻoli, and Waikoko Streams feed into, is classified as unknown by NOAA near the survey area (Coyne et al. 2003). The nearest coral reef, according to NOAA Nautical Charts, is approximately 780 feet (238 m) northwest of the Waikoko Bridge survey area (NOAA Nautical Charts 2002).

Hawaiian monk seal sightings have been reported at Waipā, and Waikoko. No sightings have been reported for Waiʻoli (personal communication, Tracy Mercer, NOAA, August 19, 2015). According to the *Watershed Management Plan for Hanalei Bay Watershed*, Hawaiian monk seals have rarely been reported in Hanalei Bay (Sustainable Resources Group Intn'l, Inc. 2012). Portions of the Waikoko Bridge survey area fall within recently designated terrestrial critical habitat, with surrounding waters designated as marine critical habitat for the Hawaiian monk seal.

The threatened green sea turtle and hawksbill sea turtle were not observed during the biological survey; however, these animals may be found foraging in marine waters of Hanalei Bay, or hauling out or basking on the beaches in the survey area. The green sea turtle has been recorded basking on the eastern side of Hanalei Bay, which is not in the immediate vicinity of the survey area (Sustainable Resources Group Intn'l, Inc. 2012). Both green sea turtles and hawksbill sea turtles have not been recorded nesting in Hanalei Bay, according to NOAA-Pacific Islands Fisheries Science Center (Parker et al. 2005).

3.8.1.3 Special Status Species and Critical Habitat

The USFWS and NOAA list 12 species that may occur in the Wainiha Bridges action area: nine endangered species, two threatened species, and one proposed endangered species. Based on current distribution and habitat requirements, nine of these species—the Hawaiian coot, Hawaiian gallinule, Hawaiian stilt, Hawaiian duck, nēnē, Hawaiian hoary bat, Hawaiian monk seal, green sea turtle and hawksbill sea turtle —have the potential to use the habitat of the action area. The Hawaiian petrel (*Pterodroma sandwichensis*), Newell's shearwater (*Puffinus auricularis newelli*) and band-rumped storm petrel (*Oceanodroma castro*) are unlikely to occur in the action area because suitable habitat does not exist; however, these seabirds may be attracted to construction lights as they fly over the action area. Table 3-11 lists the species and their habitat requirements, and information on their potential to occur in the action area.

TABLE 3-11
Species Federally Listed as Endangered or Threatened or Proposed Listed with Potential to Occur in the Action Area

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area
Birds			
Hawaiian coot (*Fulica alai*)	Endangered	Found in freshwater and brackish-water marshes and ponds. This species is associated with emergent marsh habitat in lowland valleys, reservoirs, and occasionally in high-elevation plunge pools. Nests are built on floating vegetation.	Known to occur; nesting Hawaiian coot were observed at Wainiha Bridge 1 during the survey. Suitable nesting and foraging habitat occurs in the emergent wetland vegetation type and in the standing water in the action area.

TABLE 3-11

Species Federally Listed as Endangered or Threatened or Proposed Listed with Potential to Occur in the Action Area

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area
Hawaiian gallinule (*Gallinula chloropus sandvicensis*)	Endangered	Found in freshwater marshes, taro patches, irrigation ditches, reservoirs, and wet pastures. This species favors dense emergent vegetation near open water, floating or barely emergent mats of vegetation, and water depths of less than 3 feet. It prefers freshwater over saline or brackish water. Nesting occurs throughout the year.	Known to occur; seen during the survey, and known to nest throughout the year near at Waiʻoli Bridge. Suitable nesting and foraging habitat occurs in the emergent wetland vegetation type and in the standing water in the action area.
Hawaiian stilt (*Himantopus mexicanus knudseni*)	Endangered	Prefers a variety of aquatic habitats but is limited by water depth and vegetation cover. This species likes to loaf in open mudflats, sparsely vegetated pickleweed mats, and open pasturelands. Specific water depths of 5 inches are required for optimal foraging. Nest sites are frequently separated from feeding sites, and stilts move between these areas daily. Nesting sites are adjacent to or on low islands within bodies of fresh, brackish, or salt water.	May occur; suitable nesting and foraging habitat occurs in the emergent wetland vegetation type in the action area. Could also be present in any areas with shallow water within the action area.
Hawaiian duck (*Anas wyvilliana*)	Endangered	Found in lowland wetlands, river valleys, and mountain streams. Nesting occurs on the ground near water (USFWS 2011a).	Known to occur; Hawaiian ducks flew over Wainiha Bridge 2 & 3 during the surveys. Suitable nesting habitat occurs in the ruderal, hau thicket, mixed non-native forest, and ornamental landscaping vegetation types. Suitable foraging habitat occurs in the emergent wetland, ruderal, hau thicket, mixed non-native forest, and ornamental landscaping vegetation types in the action area. Could also be present in areas with standing water.
Nēnē (*Branta sandvicensis*)	Endangered	Frequents scrubland, grassland, golf courses, sparsely vegetated slopes, and open lowland country. They do not require standing or flowing water for successful breeding but will use it when available. Nest sites include various habitat types ranging from beach strand, shrubland, and grassland to lava rock, and elevations ranging from coastal lowlands to alpine areas (Banko 1988; Banko et al. 1999).Their current distribution has been highly influenced by captive-bred releases into the wild.	Known to occur. Suitable foraging habitat occurs in the ruderal, emergent wetland, and ornamental landscaping vegetation types. Suitable nesting habitat occurs in the ruderal, hau thicket, mixed non-native forest and ornamental landscaping vegetation types in the action area.
Hawaiian petrel *(Pterodroma sandwichensis)*	Endangered	Breeding season is from March to October, during which time this species nests in some of the main Hawaiian Islands, notably on Maui, Lānaʻi, and Kauaʻi. They nest in burrows, primarily in remote montane locations, along large rock outcrops, under cinder cones, under old lichen-covered lava, or in soil beneath dense vegetation. This species was once abundant on all main Hawaiian islands except Niʻihau. Today, the largest known breeding colonies are found at Haleakala Crater on Maui and on the summit of Lānaʻi. Other colonies are on Kauaʻi, the Island of Hawaiʻi, and possibly Molokaʻi.	Unlikely to occur in the action area. Hawaiian petrels may fly over the action area at night while transiting between nest sites and the ocean, but they are not likely to land or use habitat because nesting habitat does not occur in the action area.

TABLE 3-11
Species Federally Listed as Endangered or Threatened or Proposed Listed with Potential to Occur in the Action Area

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area
Newell's shearwater (*Puffinus auricularis newelli*)	Threatened	During their 9-month breeding season from April through November, this species nests in burrows under ferns on forested mountain slopes and needs an open downhill flight path through which it can become airborne. These burrows are used year after year and usually by the same pair of birds. The Newell's shearwater was once abundant on all main Hawaiian islands. Today, Newell's shearwater breed on Kaua'i, the Island of Hawai'i, Moloka'i, and Lehua.	Unlikely to occur in the action area. Newell's shearwater may fly over the action area at night while transiting between nest sites and the ocean, but are not likely to land or use habitat because nesting habitat does not exist in the action area.
Band-rumped Storm Petrel (*Oceanodroma castro*)	Proposed endangered	This species is found in several areas of the subtropical Pacific and Atlantic Oceans. In Hawai'i, it is known to nest on Kaua'i, Lehua Islet, and the Island of Hawai'i. It likely nests in remote cliff locations. Only three inactive nests have ever been found in the Hawaiian Islands; all were located in small caves or crevices. Adults visit the nest site after dark. When not at nest locations, it forages on the open ocean.	Unlikely to occur in the action area. Band-rumped storm petrel may fly over the action area at night while transiting between nest sites and the ocean, but are not likely to land or use habitat because nesting habitat does not exist in the action area.
Mammals			
Hawaiian monk seal (*Neomonachus schauinslandi*)	Endangered	Endemic to the Hawaiian archipelago and found mostly in the Northwestern Hawaiian Islands. Increasing sightings reported from the Main Hawaiian Islands. Hawaiian monk seals spend most of their time in the ocean but rest on sandy beaches, and sometimes use beach vegetation as shelter from wind and rain. There are accounts of seals traveling up some rivers and streams.	Known to occur in the action area. The action area does contain habitat that could support Hawaiian monk seal pupping, nursing, and haul-out. Monk seals have potential to travel up the streams in the action area.
Hawaiian hoary bat (*Lasiurus cinereus semotus)*	Endangered	This species is found primarily from sea level to 7,500 feet, although it has also been observed above 13,000 feet. Most of the available documentation suggests that this elusive bat roosts among trees in forested areas. It has been observed on the Islands of Hawai'i, Maui, Moloka'i, O'ahu, and Kaua'i.	May occur in the action area. Bat roosting could occur in the Mixed Non-Native Forest and Ornamental Landscaping vegetation types of the action area. Foraging could occur over several vegetation types (e.g., Mixed Non-native Forest and Ornamental Landscaping) and along stream corridors.

TABLE 3-11
Species Federally Listed as Endangered or Threatened or Proposed Listed with Potential to Occur in the Action Area

Common Name (scientific name)	Status*	Range or Habitat Requirements†	Potential for Occurrence in Action Area
Reptiles			
Green sea turtle (*Chelonia mydas*)	Threatened	The green sea turtle is found worldwide in warm seas. They occupy three habitat types: open beaches, open sea, and feeding grounds in shallow, protected waters. In Hawai'i, nesting occurs throughout the Hawaiian archipelago. They have been documented transiting some Hawai'i rivers up to 2 miles (3 km) inland.	Known to occur in the shallow, protected waters of the action area. The action area contains beach habitat that could support nesting and shallow water habitat that supports green turtle foraging.
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered	The hawksbill sea turtle is found in warm tropical waters worldwide. The hawksbill turtle is a shy tropical reef–dwelling species that feeds on jellyfish, sea urchins, and sea sponges. It may also eat algae that grows on the reef. In Hawai'i, nesting occurs on the Islands of Hawai'i, Maui, Moloka'i, and O'ahu.	May occur in the shallow, protected waters of the action area. The action area contains beach habitat that could support nesting and shallow water habitat that supports hawksbill sea turtle foraging.

*** Federal (USFWS) status definitions:**

Endangered: Any species considered by the USFWS as being in danger of extinction throughout all or a significant portion of its range. The ESA specifically prohibits the take of a species listed as endangered. *Take* is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

Threatened: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The ESA specifically prohibits the take (see definition above) of a species listed as threatened.

Proposed: Any species of fish, wildlife, or plant that is proposed in the *Federal Register* to be listed under Section 4 of the ESA.

† Unless otherwise noted, data are from USFWS (2014b).

Section 4.1.5 of this EA describes ESA requirements for all federal projects. Section 7 of the ESA requires consultations with Federal wildlife management agencies, such as the USFWS and NMFS, for projects that may affect listed species. FHWA is currently consulting with the USFWS and NMFS for this project.

Designated Critical Habitat

No critical habitat occurs within the immediate project area; however critical habitat for the Hawaiian monk seal occurs in the action area which is a larger area that may be affected by noise and light. Critical habitat was first designated for the Hawaiian monk seal in 1986, and expanded in 1988. In 2008, NMFS received a petition to further expand the existing critical habitat designation in the Main Hawaiian Islands (MHI) and the Northwestern Hawaiian Islands (NWHI), and a revised critical habitat area became effective in September 2015 (NOAA 2015).

In the MHI, there are six specific areas of terrestrial and marine habitats; these include marine habitat from the 656-foot (200-m) depth contour line (including the seafloor and all subsurface waters and marine habitat within 32 feet [10 m] of the seafloor) through the water's edge, and the terrestrial environment to 15 feet (5 m) inland from the shoreline between identified boundary points on the Islands of Ka'ula, Ni'ihau, Kaua'i, O'ahu, Kaho'olawe, Lāna'i, Maui, Moloka'i, and Hawai'i (NOAA 2015). *Shoreline* is defined by the USFWS as "upper reaches of the wash of waves, other than storm or seismic waves, at high tide during the season in which the highest wash of the wave occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris" (USFWS 2011b).

Each of the areas contains one or a combination of physical or biological features essential to conservation of the species, and that may require special management consideration or protections. Two terrestrial and one marine essential feature have been identified for the Hawaiian monk seal critical habitat. These essential features are as follows:

- Terrestrial areas and the adjacent shallow sheltered aquatic areas with characteristics preferred by Hawaiian monk seals for pupping and nursing.

- Marine areas from 0 to 656 feet (0 to 200 m) deep that support adequate prey quality and quantity for juvenile and adult Hawaiian monk seal foraging.

- Significant areas used by Hawaiian monk seals for hauling-out, resting, or molting.

Kaua'i provides approximately 28 miles (45 km) of coastline that support preferred pupping and nursing areas and significant haul-out areas, as well as 215 square miles (557 km^2) of marine foraging habitat essential to Hawaiian monk seal conservation (NOAA 2015).

No terrestrial or marine critical habitat occurs within the project area. In the action area, a total of 0.15 square miles (0.39 km^2) of marine critical habitat is present. Only a small amount of terrestrial critical habitat (about 435 square feet) occurs on the edge of the Wainiha Bridges 1, 2, and 3 action area to the northwest of Wainiha Bay. No terrestrial monk seal critical habitat occurs in the remaining portion of the action area, which includes Hanalei Bay.

3.8.1.4 Essential Fish Habitat

Essential Fish Habitat (EFH) is broadly defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Sustainable Fisheries Act to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." This language is interpreted or described in the 1997 Interim Final Rule (962 Federal Register 66551, Section 600.10, Definitions; NMFS 1997). Marine organisms managed in accordance with the MSA and the Hawai'i Archipelagic FEP include coral reef ecosystem species, precious corals, bottomfish and seamount groundfish, crustaceans, and pelagic species. Federally managed species in the Pacific Islands Region for which EFH has been designated are referred to as the Management Unit Species (MUS) and include: Coral Reef Ecosystem MUS (CRE-MUS); Bottomfish MUS (BMUS)/Seamount Groundfish (SMUS); Pelagics MUS (PMUS), Crustaceans MUS (CMUS), and Precious Corals MUS (PC MUS).

The Wainiha Bridges project area does not include EFH; however, Wainiha Bay and Hanalei Bay, which are downstream of the project area are designated as EFH for four MUS: Bottomfish, Pelagics, Coral Reef Ecosystem, and Crustaceans. A summary of the MUS downstream of the project area is provided below.

Bottomfish:

For eggs and larvae, water column to 400 m depth from the shoreline to the U.S. Exclusive Economic Zone (EEZ) boundary. For juveniles and adults, water column and all bottom from shoreline down to 400 m depth.

Pelagics:

For eggs and larvae, water column down to 200 meters depth from shoreline out to EEZ boundary. For juveniles and adults, water column down to 1000 meters depth from shoreline out to EEZ boundary.

Coral Reef Ecosystem:

Water column and all bottom from shoreline to 100 m depth are designated as EFH.

Crustaceans:

For lobsters/crabs eggs and larvae, water column down to 150 m depth from shoreline to EEZ boundary. For lobsters/crabs juveniles and adults, bottom from shoreline down to 100 m depth. For eggs and larvae of deepwater shrimp, outer reef slopes between 300-700 m depth. For juveniles and adults of deepwater shrimp, outer reef slopes between 550-700 m depth.

Wainiha Bay has the potential to support various marine communities, including algae, corals, invertebrates, fishes, sea turtles, and monk seals. Due to sharks, and strong currents and surf just beyond the mouth of Wainiha Stream, marine studies in that area are limited (personal communication, Alan Friedlander,

University of Hawai'i at Mānoa, April 2015). In 2012, Runyon surveyed two sites out on Wainiha reef approximately 2,575 feet from the Wainiha Stream mouth (personal communication, Christina Runyon, University of Hawai'i student, January 25, 2016). At those study sites she recorded eight different coral species and between 41 to 79% coral cover. In May 2013, biologists from NOAA's Coral Reef Ecosystem Division conducted a survey in Wainiha Bay in response to a potential coral disease, specifically focusing on *Montipora patula*. Although this survey was conducted more than 1,600 feet (300 m) from the shoreline, it did document a relatively high percentage of coral in the bay compared to other sites on Kaua'i (personal communication, Bernardo Vargas-Angel, NOAA, May 3, 2015).

Most of Wainiha Bay is mapped as unknown habitat by NOAA. The shoreline intertidal area of Wainiha Bay just outside the mouth of the stream is classified as sand/unconsolidated sediment, and the shoreline intertidal along the southern portion is classified as hardbottom, uncolonized volcanic rock/boulders (Coyne et al. 2003). NOAA Nautical Charts report a coral reef on the northwestern portion of Wainiha Bay, roughly 171 m (560 feet) from the stream mouth (NOAA Nautical Charts 2002).

The benthic composition of Hanalei Bay, which Waipā, Wai'oli, and Waikoko Streams feed into, is classified as unknown by NOAA near the survey area (Coyne et al. 2003). The nearest coral reef, according to NOAA Nautical Charts, is approximately 780 feet (238 m) northwest of the Waikoko Bridge survey area (NOAA Nautical Charts 2002).

3.8.2 Potential Impacts

3.8.2.1 No Action Alternative

Implementation of the No Action Alternative would result in a continuation of current roadway conditions as well as routine maintenance activities. The No Action Alternative would not result in any activities or impacts to plant or wildlife species that differ from existing conditions.

3.8.2.2 Action Alternative

Implementation of the Action Alternative would result in removal and trimming of plants and habitat in the project area. Much of these impacts would be short-term as temporarily impacted areas would be revegetated with non-invasive plant species appropriate for the project area. Due to the high precipitation received in the project area, revegetation success is likely very high. Temporary BMPs would be installed as discussed below to protect receiving waters from erosion and sediment potential, and necessary BMPs would remain in place until sufficient vegetation cover has established. These stormwater BMPs, as well as BMPs for isolation and confinement for any in-water work, would protect freshwater, estuarine, and marine communities from the erosion and sediment potential that exists from vegetation removal and ground-disturbing activities when soil is exposed. Impacts to these communities would also further be minimized by the maintenance of unimpeded flow during construction activities, to allow passage of aquatic species during construction. Work areas would also be separated from flowing waters in isolated areas to protect both water quality and aquatic species.

The short-term loss of vegetation would constitute a temporary habitat loss to those that may use that habitat for nesting or foraging. Permanent impacts would constitute a permanent habitat loss and would result from placement of the permanent bridges, roadway, and associated features. Because the new bridges would be constructed to closely match the existing alignment, nearly all of the permanent impacted area is currently disturbed with the existing bridges and roadway. For purposes of environmental analysis in this EA, the entire project area was assumed to be temporarily impacted because specific contractor means and methods and location of material staging are not known in preliminary design. Actual impacts would likely be less. Impacts would be highly localized at each bridge location and the total approximate amount of potential disturbance is listed in Table 3-12, below.

TABLE 3-12
Potential Temporary and Permanent Disturbance Amounts

Bridge Location	Temporary Disturbance Estimate (acres)	Permanent Disturbance (acres), includes existing disturbed areas
Bridge 1	0.7	0.3
Bridge 2&3	2.27	0.9
Waiʻoli	0.9	0
Waipā	0.9	0
Waikoko	0.7	0
Total	**5.47**	**1.2**

In addition to habitat impacts, short-term impacts may also be associated with noise and disturbance during construction activities as some wildlife may be deterred from nesting or foraging in or near the project area, and the presence of noise and use of lighting may affect some species in adjacent habitats or in overflight. Specific discussions on special status species and the effects of the Action Alternative are provided below. Section 7 consultation by FHWA-CFLHD, the lead federal agency for the project who is responsible for administration and oversight of construction, is ongoing with the USFWS and NOAA and will be completed prior to agency project approval.

Federal- and State-Listed Species

Hawaiian Hoary Bat

Acoustic surveys for Hawaiian hoary bats were not conducted, but areas of suitable habitat for roosting and foraging were noted during the biological survey. The Wainiha, Waiʻoli, Waipā, and Waikoko stream corridors and the ruderal, emergent wetland, and hau thicket vegetation types in the action area are suitable for bat foraging. The Hawaiian hoary bat has been observed roosting in coconut, ironwood, kukui, and mango trees and therefore could roost in the mixed non-native forest, and ornamental landscaping vegetation type in the action area.

Direct impacts on bats could occur during vegetation removal if a juvenile bat that is too small to fly but too large to be carried by a parent is present in a tree or branch that is cut down. However, because of the conservation measure that trees would not be cut during the breeding season (June 1 through September 15), direct impacts are unlikely to occur. The potential for direct impacts would also be reduced by ensuring the top wire strand of surrounding fences (if present) is barbless, as listed in the conservation measures.

In the short term, the human noise and disturbance associated with construction activities could temporarily displace bats from roosting and/or foraging habitats. This displacement could alter an individual's typical foraging and roosting patterns, forcing it to expend energy to search for new foraging and roosting locations. Displacement from roosting habitat could lead to increased predation on individual bats, especially if a bat is forced to leave its roost during daylight hours, making it more visible to potential predators. The potential for these impacts is low considering the project would occur on and immediately adjacent to a heavily traveled roadway, and therefore the bats present would already be accustomed to high levels of background noise. Furthermore, high-quality roosting and foraging areas occur in the action area, into which bats could be displaced.

Nēnē

Nēnē were observed flying over Waiʻoli Bridge during the surveys and may use the ruderal, emergent wetland, mixed non-native forest and ornamental vegetation types for foraging and nesting. Permanent

removal of foraging and nesting habitat would constitute a long-term *direct* impact. Approximately 1.27 acres would be permanently disturbed under the proposed action (e.g., bridges, roadway, and associated features). A portion of the permanently disturbed area, such as the existing paved road, is not currently suitable for nesting or foraging, and therefore disturbances in those areas would not affect nēnē. The remainder of the project area would be disturbed temporarily by staging areas and access roads, and would be reclaimed following construction. The impact of removing foraging and nesting habitat would be discountable due to the small area of impact and availability of adjacent foraging and nesting habitat for displaced nēnē to use.

Direct impacts to nēnē could occur during vegetation removal if a nest is damaged or goslings are separated from adults. However, direct impacts are highly unlikely to occur because conservation measures (e.g., nēnē surveys, staff training, and stop-work provision) would be implemented as described in section 3.8.3. In addition, the project area at bridges with higher potential for nēnē (i.e., Waiʻoli and Waikoko) would be fenced to minimize the potential for the species to enter the project area. In the short term, the human noise and disturbance associated with construction activities could temporarily displace nēnē from nesting and/or foraging habitats. Displacement from available nesting and/or foraging habitat could impact the health of these individuals; however, because a small amount of habitat would be removed, it would not likely affect nest success or population growth. Furthermore, foraging and nesting habitat is available adjacent to the project area, into which the nēnē could move.

Seabirds

The action area does not provide suitable nesting or foraging habitat for Hawaiian petrel, Newell's shearwater, or band-rumped storm petrel, collectively referred to as seabirds. However, breeding individuals may fly over the action area at night while travelling between upland nesting and ocean foraging sites. Disorientation and fall-out as a result of light attraction could occur to individuals attracted to nighttime construction lighting. The conservation measures regarding nighttime lighting, as listed in section 3.8.3, would avoid and minimize the potential for light-attraction impacts to these species. This includes no nighttime construction during the peak seabird fallout period, and shielding nighttime lighting to prevent upward radiation. Outside of the peak fallout period, construction may occur for a maximum of 12 nights. No changes in lighting color or intensity are anticipated as a result of the project. Implementation of the conservation measures would reduce the potential for adverse impacts to unlikely and discountable.

Waterbirds

The Hawaiian coot, Hawaiian gallinule, Hawaiian stilt, and Hawaiian duck constitute the waterbird group. Because these species share similar habitat needs and biological characteristics, they can be discussed as a single group. The vegetated streambanks along the Wainiha, Waiʻoli, Waipā, and Waikoko Stream provide vegetation types that are suitable for foraging and nesting for all four waterbirds.

Permanent removal of foraging and nesting habitat would constitute a long-term direct impact. Approximately 1.1 acres of upland vegetation across five bridge sites would be removed under the proposed action, a portion of which constitutes foraging habitat for waterbirds. Approximately 0.58 acre of emergent wetland would also be removed, an area that could serve as nesting habitat for the Hawaiian coot, Hawaiian gallinule, and Hawaiian duck. Of this vegetation removal, 0.26 acre, or 45%, would be temporary because the area (e.g., staging area and access roads) would be reclaimed following construction. This impact would be discountable due to the small area of impact and availability of adjacent foraging and nesting habitat for displaced waterbirds to use.

Impacts to waterbirds could occur if human activity, noise, and removal of vegetation disrupt nesting adults, causing temporary or permanent abandonment of nest, ducklings, and/or chicks, which could in turn increase the likelihood of nest failure, predation, exposure, or trauma. Disturbance to duckling- and/or chick-rearing areas can result in separation of young from adults, which often results in duckling/chick mortality due to predation, exposure, and/or trauma. The project would avoid direct removal of active

nests, eggs, and young by implementation of conservation measures such as pre-construction nest surveys of the project area to be disturbed through removal of nesting habitat, and work not proceeding until the young have fledged. Unavoidable impacts would occur from human noise and disturbance from construction equipment due to the presence of nearby suitable nesting and foraging habitat. This could temporarily displace waterbirds and could alter an individual's typical nesting, foraging, and/or roosting patterns. Conservation measures have been identified in consultation with the USFWS and have been incorporated into the project and are listed in section 3.8.3. Impacts would be less than significant due to the noise impacts being temporary, and the abundant nearby available habitat.

Hawaiian Monk Seal

Monk seals may occur in the action area. Suitable foraging habitat is present in the nearshore marine waters and riverine habitat of the action area. Suitable haul-out and pupping habitat is also present in the action area which have sandy and protected beaches adjacent to shallow, sheltered aquatic areas. Although suitable pupping habitat is present, no monk seal pups are known to have been born in the action area (Mercer 2015a,b). Hawaiian monk seal sightings have been reported at Wainiha Bay. Between 2005 and 2014, there were six reported sightings of monk seals at Wainiha Beach. No Hawaiian monk seals were sighted at Wainiha Beach during aerial surveys in 2000, 2001, and 2008. No monk seal pups are known to have been born within Wainiha Bay (Mercer 2015a). Hawaiian monk seal sightings have been reported at Waipā and Waikoko. Between 2005 and 2014, there were five and six reported sightings of monk seals at Waipā and Waikoko, respectively. No sightings have been reported for Waiʻoli (Mercer 2015b). According to the *Watershed Management Plan for Hanalei Bay Watershed*, Hawaiian monk seals have rarely been reported in Hanalei Bay (Sustainable Resources Group Intn'l, Inc. 2012). No documented monk seal births have occurred within Hanalei Bay (Mercer 2015b).

Hawaiian monk seals could also be temporarily displaced from nearshore marine and riverine foraging areas during construction. Displacement from riverine foraging habitat would not have a significant impact on monk seals, because foraging individuals could find similar resources upstream or downstream from the construction site or return to marine habitats. If monk seals are displaced from nearshore marine habitats, they would flee to deeper waters or to other foraging locations along the shoreline. Evidence suggests that Hawaiian monk seals have less sensitive hearing in water than other pinnipeds (Muñoz et al. 2011); therefore, the magnitude of noise impacts may be less for seals foraging in the water.

Female monk seals could be discouraged from pupping on beaches in the action area due to the noise and human activity associated with construction. These females would be displaced into other pupping areas north or south of the action area. However, because pupping has never been observed in the action area, this effect is highly unlikely to occur. The female and pup would be afforded a 300-foot (91.44-m) buffer, ensuring that no direct effects to the mother and pup would occur.

In the short term, activities associated with construction (noise, movement of equipment, light) could temporarily displace Hawaiian monk seals from preferred haul-out areas that occur within the Wainiha Bridges action area. Evidence from observations of individuals from the MHI subpopulation suggests that basking Hawaiian monk seals are surprisingly tolerant of human activity (NOAA NMFS 2015c). When disturbed, the response is usually for the seal to return to the water. Temporary displacement from haul-out sites could alter an individual's typical energetic expenditure, forcing it to seek out other haul-out sites. Disturbance from harassment by construction workers would not occur because workers would be informed not to feed, touch, ride, or otherwise intentionally interact with any listed species, including the monk seal. Construction activities would not occur if a monk seal is in the construction area or within 150 feet (46 m) of the construction area. Construction would only begin after the animal voluntarily leaves the area or the onsite biological monitor determines the animal would not be adversely affected. In-water work would be restricted to daylight hours, unless emergency maintenance and repair of erosion and sediment controls are necessary to meet permit conditions.

Because of the Hawaiian monk seal conservation measures (shielded nighttime lighting, buffers from individuals and pups, preventing human interaction), direct impacts would be insignificant. The primary threats to Hawaiian monk seals in the MHI (entanglement in fishing gear, impact from boats, and predation by fishermen) are not expected to increase as a result of the proposed action.

Indirect harm from the accidental introduction of sediments, contaminants, or construction-related debris into Wainiha, Waiʻoli, Waipā, or Waikoko streams has the potential to reduce water quality in the streams and bays. However, these impacts would be unlikely and discountable because conservation measures, such as those described in section 3.8.3, would be in place to minimize the potential for siltation, spills, and contamination. These conservation measures include fueling equipment away from the water, inspecting and cleaning all equipment before daily operations, training personnel for emergency spill prevention, appropriate use of erosion and sediment control practices, and cleaning all potential contaminants from the site. Water quality sampling, including both Turbidity and pH, would also be performed throughout the construction period.

Hawaiian Monk Seal Critical Habitat

There is no Hawaiian monk seal designated critical habitat in the project area; therefore, no direct effects would occur on designated critical habitat. However, recently designated Hawaiian monk seal terrestrial critical habitat occurs within the action area, with surrounding waters designated as marine critical habitat for the Hawaiian monk seal. The essential critical habitat features for this species are 1) terrestrial areas and adjacent shallow, sheltered aquatic areas with characteristics preferred for pupping and nursing; 2) marine areas from 0 to 656 feet (0 to 200 m) deep that support adequate prey quality and quantity for juvenile and adult monk seal foraging; and 3) significant areas used by Hawaiian monk seals for hauling out, resting, or molting.

Indirect effects on these three features consist of temporary construction impacts to water quality (turbidity, siltation, pollutants, and debris) and noise and light disturbances. Impacts on water quality would be discountable due to implementation of conservation measures and BMPs that would maintain water quality. Low levels of light and noise from the construction activities could impact critical habitat; however, the conservation measures regarding nighttime lighting, as listed in section 3.8.3, would minimize the impact of lighting, reducing it to an unlikely and discountable impact.

Sea Turtles

No sea turtles were incidentally observed during SWCA's field survey, but suitable habitat for basking, nesting, foraging, and predator avoidance was noted. Wainiha and Hanalei Bays provide suitable beach habitat for basking and nesting, the surrounding marine waters provide suitable foraging and resting habitat, and the Wainiha, Waiʻoli, Waipā, and Waikoko streams provide foraging and predator avoidance habitat.

Construction activities (e.g., noise and light) could impact sea turtles by displacing individuals from the beach, marine, and riverine habitats in the Wainiha Bridges action area. This displacement could alter an individual's typical energy expenditure by forcing it to search for new foraging and basking locations. If they are disturbed, the likely response would be to return to the shallow water's edge and swim away. Noise and light from construction may also temporarily discourage turtles from using the area as a nesting location. With regard to noise, the main concern would be loud low-frequency sounds during the nesting period. Increased lighting during the breeding season evening hours is likely to dissuade turtles from emerging to lay eggs on afflicted beaches. Artificial lighting is known to disorient hatchlings, which orient toward brighter lights after emerging from their nest. The conservation measures regarding nighttime lighting, such as minimizing night work and using shielded lights (see section 3.8.3), would minimize the impact of lighting, reducing it to an unlikely and discountable impact.

Human-related disturbance (e.g., harassment) and mortality (e.g., impact from boat propellers, gill net entanglement, and fishing activities) are not likely to increase as a result of the proposed action. The

implementation of the conservation measures in section 3.8.3 regarding nighttime lighting (e.g., not working within 150 feet [46 m] of sea turtles, removing construction-related entanglement threats and potential for human interaction, and using shielded lighting) would reduce construction activities to an unlikely and discountable impact.

Indirect harm from the accidental introduction of contaminants or construction-related debris into Wainiha, Waiʻoli, Waipā, or Waikoko streams has the potential to reduce water quality in Wainiha and Hanalei bays. However, the potential for these impacts would also be unlikely and discountable by ensuring appropriate BMPs and conservation measures are in place, as described in the conservation measures. These include fueling equipment away from the water, inspecting and cleaning all equipment before daily operations, training personnel for emergency spill prevention, and cleaning up. To avoid exacerbating the incidences of disease such as fibropapillomatosis in green sea turtles as a result of the proposed action, BMPs and conservation measures would be implemented to ensure that the proposed action does not increase nitrogen or other nutrient loads to nearshore waters. These contaminants are known to promote algae growth into the surrounding waters (Smith et al. 2010).

Essential Fish Habitat

No activities would occur within EFH under the Action Alternative; however, indirect impacts to EFH are a potential from increased siltation, turbidity, or release of pollutants associated with construction activities in, over, or adjacent to the streams if not adequately implemented. Wainiha Stream has relatively continuous surface connection to Wainiha Bay. Waikoko, Waiʻoli, and Waipā streams have a relatively continuous surface connection to Hanalei Bay. Coral reef cover and function can decline if siltation and turbidity increases from upland sources and coral becomes covered in sediment. Impacts to coral habitat can also impact fishes including feeding, spawning and reproduction. Potential impacts to water quality would be temporary during the construction phase. The accidental introduction of contaminants and construction-related debris into Wainiha, Waiʻoli, Waipā, or Waikoko streams has the potential to reduce water quality in the streams and bays. However, these impacts would be unlikely and discountable because conservation measures and BMPs would be in place to minimize the potential for spills and contamination. In the long-term, no changes in water flow and/or volume are expected. The amount of freshwater input to EFH is expected to remain the same because there will not be a long-term increase in impermeable surfaces.

Indirect harm from the accidental introduction of sediments, contaminants, or construction-related debris into Wainiha, Waiʻoli, Waipā, or Waikoko streams has the potential to reduce water quality in the streams and bays. However, these impacts would be unlikely and discountable because conservation measures, such as those described below and in detail in section 3.3, Water Resources, would be in place to minimize the potential for siltation, spills, and contamination.

The much smaller Waikoko, Waipā, and Waiʻoli Streams all enter Hanalei Bay across sandy beaches. Compared to Wainiha Bay, Hanalei Bay is more protected from ocean conditions. In addition, Waikoko, Waipā, and Waiʻoli streams are much smaller than Wainiha in terms of flow. Therefore, the impact of these steams on the marine communities in the bay is smaller than the impact of Wainiha Stream on Wainiha Bay.

Based upon the project design and implementation of BMPs, the project may result in temporary minimal impacts associated with the bridge construction and improvements but these impacts would be insignficant.

3.8.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the proposed action would include a variety of avoidance, minimization, and/or mitigation measures to reduce or eliminate project-related impacts. Impacts would be less than significant with implementation of the following:

Waterbirds

- In areas where vegetated streambanks would be disturbed, waterbird nest searches would be conducted by a qualified biologist before any work is conducted and after any subsequent delay in work

of 3 or more days (during which birds may attempt nesting). The results of the pre-construction survey would be submitted to the USFWS.

- If a waterbird nest with eggs or chicks/ducklings is discovered in the project area, work would not begin until the nest until the chicks/ducklings have fledged.
- Waterbird nests, chicks, or broods found in the survey area before or during construction would be reported to the USFWS within 48 hours.

Nēnē or Hawaiian Goose (*Branta sandvicensis*)

- A qualified biologist would survey the area for nesting nēnē before construction (in coordination with the waterbird surveys), and after any subsequent delay in work of 3 or more days (during which birds may attempt nesting). The results of the pre-construction survey would be submitted to the USFWS.
- If a nēnē is found in the area during ongoing activities, all activities within 100 feet (30 m) of the bird would cease, and the bird would not be approached. If a nest is discovered, USFWS would be notified. If a nest is not discovered, work may continue after the bird leaves the area of its own accord.
- All regular on-site staff would be trained to identify nēnē and would know the appropriate steps to take if nēnē are present on-site. Training would not be necessary if a biological monitor is present for the duration of the construction.
- If a nēnē is found in the area during ongoing activities, all activities within 100 feet (30 m) of the bird would cease, and the bird would not be approached. If a nest is discovered, USFWS would be notified. If a nest is not discovered, work may continue after the bird leaves the area of its own accord.
- Temporary construction fencing would be erected around the Waiʻoli and Waikoko Bridge construction zones to minimize the potential for nēnē to enter the project area.

Seabirds

- Construction activity would be restricted to daylight hours during the seabird peak fallout period (September 15–December 15) to avoid the use of nighttime lighting that could attract seabirds.
- All outdoor lights would be shielded to prevent upward radiation. This has been shown to reduce the potential for seabird attraction (Reed et al. 1985; Telfer et al. 1987). A selection of acceptable seabird-friendly lights can be found online at the Kauaʻi Seabird Habitat Conservation website (2013).

Hawaiian Hoary Bat (*Lasiurus cinereus semotus*)

- Any fences that are erected as part of the project would have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. No fences in the survey area were observed with barbed wire during the survey; however, if fences are present, the top strand of barbed wire would be removed or replaced with barbless wire.
- No trees taller than 15 feet (4.6 m) would be trimmed or removed as a result of this project between June 1 and September 15, when juvenile bats that are not yet capable of flying may be roosting in the trees.

Hawaiian Monk Seal (*Neomonachus schauinslandi*) and Sea Turtles

- All regular on-site staff would be trained to identify the Hawaiian monk seal and sea turtles, and trained on what appropriate steps to take if these species are present on-site.
- Construction activities would not take place if a Hawaiian monk seal or sea turtle is in the construction area or within 150 feet (46 m) of the construction area. Construction can only begin after the animal voluntarily leaves the area. If a monk seal/pup pair is present, a minimum 300-foot (91-m) buffer would be observed. If a Hawaiian monk seal or sea turtle is noticed after work has already begun, that work may continue only if, in the best judgment of the biological monitor, that there is no way for the activity to adversely affect the animal(s).

- Any construction-related debris that may pose an entanglement threat to Hawaiian monk seals and sea turtles would be removed from the construction area at the end of each day and at the conclusion of the construction project.
- Workers would not attempt to feed, touch, ride, or otherwise intentionally interact with any listed species.
- Shielded lighting would be used to reduce direct and ambient light to potential nearby beach habitat. Lighting would be directed away from the beach.
- In-water work at night would be avoided, unless emergency maintenance and repair of erosion and sediment controls are necessary to meet permit conditions. The CO would be notified prior to any such work.

The following BMPs would be implemented to prevent the introduction and/or spread of invasive species:

- Temporarily disturbed areas would be revegetated with non-invasive plant species appropriate for the project area.
- To avoid the unintentional introduction or transport of new terrestrial invasive species, all construction equipment and vehicles arriving from outside Kaua‘i would be washed and inspected before entering the project area. In addition, construction materials arriving from outside Kaua‘i would also be washed and/or visually inspected (as appropriate) for excessive debris, plant materials, and invasive or harmful non-native species (plants, amphibians, reptiles, and insects). When possible, raw materials (gravel, rock, and soil) would be purchased from a local supplier on Kaua‘i to avoid introducing non-native species not present on the island. Inspection and cleaning activities would be conducted at a designated location.

In addition to the above measures, the following BMPs would be implemented to protect water quality, as recommended by the NMFS Protected Resources Division (NOAA NMFS 2015a) and USFWS (USFWS 2014b). The applicability of these measures to the proposed project would depend on the site-specific construction means and methods chosen. The project would also adhere to the requirements of all applicable permits.

- Turbidity and siltation from project-related work would be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
- Erosion and sediment control measures would be in place before initiating earth-moving activities. Functionality would be maintained throughout the construction period.
- When it is not possible to schedule work to avoid times of the year when high rainfall is expected, then enhancing the capacity of existing controls, adding additional control measures, or installing contingency measures would be implemented.
- Inspection would be documented, and records for all inspections and repairs would be maintained on-site. When a device proves inadequate, it would be immediately redesigned or replaced until it is effective.
- Control measures (i.e., silt fences, sand bag barriers, sediment traps, geotextile mats, and other measures intended for soil/sediment trapping) would be inspected and repaired as needed within 24 hours after a rainfall event of 0.25 inch or greater over a 24-hour period. During periods of prolonged rainfall, a daily inspection would occur, unless extended heavy rainfall makes access impossible or hazardous.
- Construction would be sequenced to minimize the exposure time of the cleared surface area.

- The contractor would be required to prepare a spill prevention, control and countermeasure (SPCC) plan before beginning work. The SPCC would describe preventative measures including the location of refueling and storage facilities and the handling of hazardous material. The SPCC would describe actions to be taken in case of a spill. Hazardous materials would be properly stored and managed in accordance with local, state, and Federal regulations.
- Appropriate materials to contain and clean potential spills would be stored at the work site and be readily available. Spill kits would be available on-site at locations where hazardous materials are used. Spill kits would be inspected regularly and supplies replaced as needed. Staff would be trained on spill prevention and cleanup.
- All project-related materials and equipment placed in the water would be free of pollutants.
- The project manager or heavy equipment operators would perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations would be postponed or halted should a leak be detected, and they would not proceed until the leak is repaired and the equipment is cleaned.
- Fueling of land-based vehicles and equipment would take place at least 50 feet (15.24 m) away from the water, preferably over an impervious surface. Fueling of vessels would be done at approved fueling facilities.
- Portable toilets for sanitary waste management would be serviced regularly.
- A plan would be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.
- No project-related materials (fill, revetment rock, pipe, etc.) would be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- No contamination (trash or debris disposal, invasive species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities.
- Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).
- All debris removed from the marine/aquatic environment shall be disposed of at an approved site. Solid waste and construction and demolition debris would be properly managed.
- Clearing and grubbing would be held to the minimum necessary for grading, access, and equipment operation.
- Revegetation success would be monitored to ensure sufficient vegetation cover has established, consistent with the NPDES permit for the project. Relevant erosion and sediment control BMPs would not be removed until sufficient vegetative cover is re-established. If vegetation fails to establish, corrective actions would be taken where necessary.
- Soil stockpiles would be located away at least 50 feet from concentrated runoff and water features, covered with plastic or other waterproof material when practicable, and surrounded by silt fences or other erosion control BMPs.
- Concrete wash-outs would be located 50 feet from storm drain inlets, open drainage areas, and waterbodies, and would be maintained as needed.
- All in-water work areas would be isolated and confined from open water habitats through the use of approved isolation techniques including filter fabrics, turbidity curtains, K-rails, Cofferdams, Sheet Piles,

Gravel/Rock berms, Gravel/Sandbag berms, Stream diversions (Pumped, pipe/flume, or excavated) or other approved means. Frequent inspections of these BMPs would be conducted to determine if devices are operating effectively. When a device proves inadequate, work would cease and it would be immediately redesigned or replaced until it is effective.

- Flow around the isolated and confined in-water work area would be unimpeded to allow for aquatic animal migration and/or to prevent downstream flooding situations. The unimpeded flow shall be equivalent to a two (2) year, 24 hour duration storm event and/or the existing flow capacity of the stream, ditch, or gulch.
- In addition to diversion and isolation of the project area, dewatering of work zones would also be completed. Dewatering would follow the procedures outlined in SM-17 of the 2008 HDOT Construction BMP Field Manual and Section 208 of the FP-14. Treatment of dewatering effluent would conform to Federal, state, and local regulations.

3.9 Archaeological and Historic Architectural Resources

3.9.1 Affected Environment

The National Historic Preservation Act of 1966 (NHPA) recognizes the nation's historic heritage and establishes a national policy for the preservation of historic properties. Section 106 of the NHPA requires that Federal agencies consider the effects of their projects on historic properties. The purpose of the Section 106 consultation process is to evaluate the potential for effects on existing historic sites, if any, resulting from the project. Similarly, Chapter 6E of HRS provides for a similar process in its intent of conserving and developing the historic and cultural property within the State for the public good. Both processes include efforts to identify historic properties, evaluate effects of agency actions on identified properties, and consult those findings with the SHPO and other identified consulting parties.

Under contract to FHWA-CFLHD, Cultural Surveys Hawai'i prepared an Archaeological Inventory Survey for the project. This report is summarized below and is included in full in Appendix E of this EA. Survey efforts included database searches and fieldwork including 100% pedestrian survey and subsurface testing, Consultation in the form of mailings, meetings, and interviews were also conducted to seek to identify historic properties and potential effects.

3.9.1.1 Archaeological Background Summary

The Island of Kaua'i, affectionately described as "*Kaua'i nui moku lehua pane'e lua i ke kai*" (Great Kaua'i of the lehua groves which seem to move two-by-two to the shore), is the oldest of the larger main Hawaiian Islands. Historically, it was divided into several districts and political units which in ancient times were subject to various chiefs—sometimes independently, and at other times, in unity with the other districts; these early *moku o loko* or districts included Halele'a, Kona, Ko'olau, Nāpali, and Puna . The lands of the Halele'a-Nāpali districts were highly valued by the *maka'āinana* (commoner) because of the streams and fresh water resources that could be diverted into extensive *lo'i kalo* (taro pond field systems). The wealth of these lands was further enhanced by the sheltered bays and rich fisheries fronting them (Stark et al. 2015).

The project sites, environmental study areas, and potential staging areas are located in the traditional *ahupua'a* of Wai'oli, Waipā, Waikoko, Lumaha'i, and Wainiha in the ancient district of Halele'a (see Figure 3-10), one of five ancient districts on Kaua'i. Legendary accounts for these five *ahupua'a* are included from the eastern *ahupua'a* of Wai'oli to the western *ahupua'a* of Wainiha. For the purpose of the AIS, Waipā and Waikoko Ahupua'a were treated together because of their size and the relatively modest recorded traditions (Stark et al. 2015).

Approximately 30 previous archaeological studies have been conducted near the current proposed project areas in the Wai'oli, Waipā, Waikoko, Lumaha'i, and Wainiha Ahupua'a. Background research emphasizes the traditional importance of the Halele'a District in pre-Contact times. Historical documentation indicates the traditional settlement pattern for Wai'oli, Waipā, Lumaha'i, and Wainiha was a combination of intensive

agriculture, predominantly taro cultivation, some fishponds, and a scatter of houses, particularly along the shoreline (Stark et al. 2015). Below is a summary of relevant historic and pre-Contact era context for the area, and information on presence or potential presence of resources, as described in Stark et al. 2015:

> Land Commission Awards (LCAs) and previous archaeology provide corroborating evidence that the coastal areas and valleys of the project areas were used for irrigated cultivation. Dams and irrigation ditches are common features on flat areas. Handy and Handy (1972) have stated there was a compact area of terraces near the coast watered by Waipā Stream. In nearby Wainiha, in all available space the land was terraced in steps into the higher valleys. The LCA documents describe at least 154 taro *loʻi* along Waiʻoli Stream and 27 unspecified *kula*, but based on traditional *kula* lands, there would have also been sweet potatoes, yams, bananas, and sugarcane. Only 14% of the awardees claimed to have held the land prior to 1824. Eleven individuals were awarded lands in Waipā Ahupuaʻa which included taro *loʻi* and house lots. The house lots were generally located along the coast, although there has been evidence of habitation and agricultural structures discovered as far inland as 1.5 km from the coast. *Kuleana* documentation specifies that the entire *ahupuaʻa* of Lumahaʻi was awarded to L. Kōnia, granddaughter of Kamehameha I, wife of Paki and mother of Bernice Pauahi Bishop, and that the *ahupuaʻa* of Waikoko was awarded to M. Kekauonohi, great-granddaughter of Kekaulike, King of Maui and granddaughter of Kamehameha the Great. A study of all the claims and their supporting testimony for Wainiha shows a typically well-developed land system in place. *Ahupuaʻa*-based settlement patterns should be visible archaeologically with habitation near the coast and agricultural concerns in the well-watered interior areas.
>
> In the mid- to late 1800s, the shift from taro to rice production was a direct response to the importation of Asian laborers as sugar plantation workers in the Hawaiian Islands as well as the introduction of eastern technology developed for irrigation and cultivation of rice. This transition in land use patterns may be visible archaeologically within the vicinity of the project areas. A historic Chinese Camp in the Lumahaʻi Valley has been documented. The shift to rice cultivation in Waipā and Lumahaʻi is further documented by leases between the Bishop Estate (owners of the former Kōnia Lumahaʻi lands), and Chulan and Company and the Sing Tai Wai Company. The peak of rice cultivation was between 1890 and 1930, but decreased when local production could not compete with cheaper prices of imported California rice. By the early 1900s areas in the Haleleʻa District had their own Chinese community that included not only the rice farmers, but also merchants and other business people (*The Garden Island*, 12 January 2015). That said, traditional Hawaiian agricultural practices have been locally reestablished, with cultivation of *kalo* ongoing throughout the lands surrounding the project areas and representing the largest active agricultural activity in the Haleleʻa District. This reinvigorated appreciation for—and efforts to teach and perpetuate—Hawaiian ways of knowing is also represented by the activities of the Waipā Foundation. Archaeological inquiry within this setting should be in the context of appreciation for the ongoing revitalization of Hawaiian traditions, cultural resources and traditional historic properties in the vicinity of the project areas.
>
> Human remains have been found within coastal Waiʻoli, Waipā, and Wainiha archaeological studies, with two burial sites documented in the vicinity of the Waipā and Waikoko project areas and four traditional burial sites plus a church cemetery documented in Waiʻoli. Three *heiau*, including Kupakoili, Halaloa, and Kailiopaia are documented in Waipā and Waikoko Ahupuaʻa. Four *heiau* are documented in the vicinity of the Wainiha project areas: Kaunupepeiao, Laumaki, Apaukalea, and a *heiau* on Popoki knoll. Traditional Hawaiian house sites, *kalo* terraces, and other agricultural infrastructure have also been documented.
>
> In the mid-twentieth century, portions of the lands within and surrounding the project areas were utilized as cattle pasture. In referencing this time period, Earle (1978) indicated extensive bulldozing for pasturage destroyed many archeological sites within the project area vicinity. Hoffman also documents the obliteration of traditional agricultural lands changed into pasture lands.

Archaeological studies in the vicinity of the project area typically note extensive bulldozing and land modifications in both the coastal and inland sections of the vicinity surrounding the project areas, particularly along the more developed coastal plain. In fact, Earle (1973) has suggested no sites remain in the Lumahaiʻi coastal plain (Stark et al. 2015).

In inland areas, historic and pre-Contact taro agricultural terrace remnants are found along the major rivers, in addition to later features associated with rice irrigation and water control. Ranching infrastructure features are also noted. Previous archaeological surveys have found pre-Contact sites in areas difficult to access such as ridges and gulches (Stark et al. 2015).

In summary, the probability of identifying pre-Contact habitation and agricultural sites in the project areas is moderated by the subjection of these lands to 150 years of historic land modification by farmers, ranchers, and residential developers. In the twentieth century, bulldozing to create cattle pasture lands destroyed many former pre-Contact sites. Previous archaeological surveys have found pre-Contact sites in areas difficult to access such as ridges and gulches.

Based on background research and previous archaeological studies, the probability of encountering in situ buried cultural resources exists. Evidence of pre-Contact land use may include, but not be limited to, human burials, midden deposits, artifacts, and trail alignments. Evidence of post-Contact land use could include agricultural infrastructure, human burials, trash pits, privies, roadways, and historic building foundations (Stark et al. 2015).

Field investigations did not result in identification of newly recorded archaeological properties, with the exception of architectural resources. These resources are described in section 3.9.1.2 below.

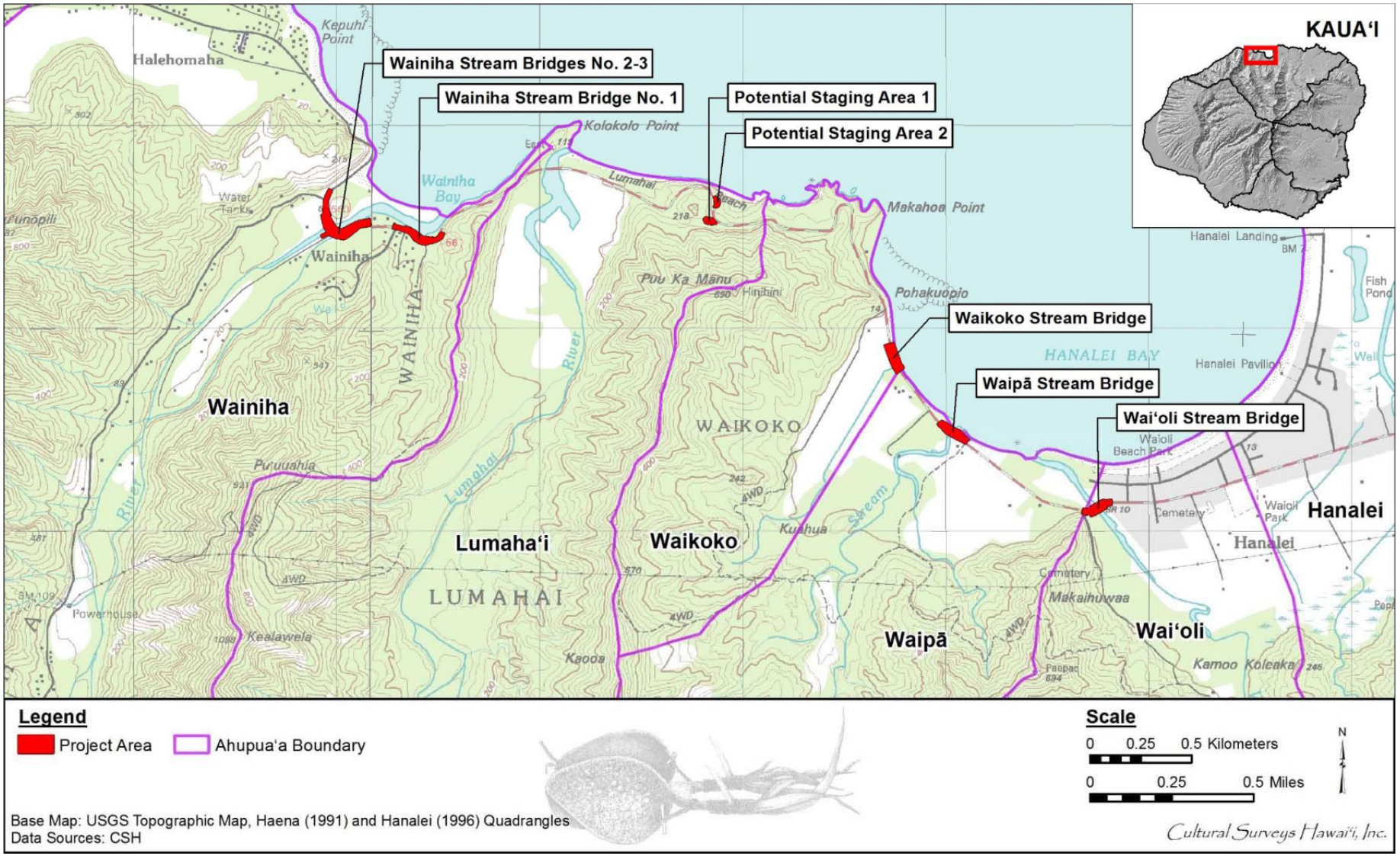

Figure 3-10. Project Area in Relation to Ahupua'a

3.9.1.2 Historic Architectural Resources

Historic architectural resources located in the project's Area of Potential Effect include the Waiʻoli, Waikoko, and Waipā bridges and the NRHP-listed Kauaʻi Belt Road North Shore section. The Kauaʻi Belt Road was nominated as a historic district under Criterion A and C for its significance and contribution to engineering, social history, and transportation. The nomination form states (NPS 2003),

> The Kaua'i Belt Road achieves state and local significance in the areas of engineering, transportation, and social history under criteria A and C. The construction of bridges and a road from 1900 to 1957 was a major transportation achievement, as the County of Kaua'i and private contractors improved an old trail/ road system and built bridges to span the North Shore's wide rivers. Thirteen bridges and culverts built between 1912 and 1957 remain along the route as an example of bridge engineering and construction in Hawai'i during the early twentieth century. The completion of an automobile route to Ha'ena circa 1928 provided modern, convenient transportation to the North Shore and its scenic and natural features. The road connected north shore residents with the rest of Kaua'i and provided an overland transportation for agricultural enterprises. The Kaua'i Belt Road is the only remaining intact example of the old belt road system on the island of Kaua'i. The Kaua'i Belt Road from Princeville to Ha'ena retains historic integrity in its original road alignment, narrow lanes, bridges, and spectacular setting along Kaua'i's north coast.

Wainiha Bridges 1, 2, and 3 are modern additions and do not contribute to the overall site's significance. Waiʻoli and Waipā Bridge were previously determined eligible for the NRHP and are considered contributing features to the overall Kauaʻi Belt Road. Waikoko Bridge is also considered a contributing feature to the NRHP-listed Kauaʻi Belt Road. One culvert, with a basalt mortared headwall and outlet was also recorded in the project area. This feature is of unknown age but it facilitates drainage across the roadway so appears to date to post-1917. It is treated as a potential contributing feature to the overall roadway's significance.

3.9.2 Potential Impacts

3.9.2.1 No Action Alternative

The No Action Alternative would continue the current conditions and keep the existing ACROW structures in place. The structures would continue to be visually incompatible with the historic district. No new changes would result.

3.9.2.2 Action Alternative

As no archaeological resources were identified within the project area, no impacts to archaeological resources are anticipated as a result of project implementation. However, the potential to encounter materials still does exist. Therefore, archaeological monitoring during construction would be performed.

Effects to historic architectural resources would be minimal as the historic Waiʻoli, Waipā, and Waikoko bridges would not be directly altered. Short-term visual effects from the placement of temporary bridges would result, but this would be a temporary and reversible change. The temporary bridges would be removed upon project completion and the site restored. Construction of new Wainiha bridges would not result in adverse effects because the existing bridges to be replaced do not contribute to the road's eligibility. Further, the bridges are being designed to be more visually compatible with the surrounding historic district. A minimal amount of right-of-way would be required for the project and would not measurably alter the transportation corridor as much of the needed area already contains transportation features.

The concrete culvert and supporting basalt and boulder revetments may be impacted during construction of the temporary bypass alignment due to the likely need to shift off the road so vehicles delivering construction materials can adequately make the turn. FHWA-CFLHD would strive to avoid this resource. However, if it is determined that potential damage is unavoidable, the feature would be documented with

photographs, and materials would be salvaged and rebuilt to mimic their original appearance. If some stone is damaged beyond re-use, materials would be used for repair that match the old in design, color, texture, and other visual qualities and, where possible, materials, consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

The Action Alternative would have "no adverse effect" in accordance with Federal regulations (36 CFR 800.5) and "effect, with proposed mitigation commitments" in accordance with HAR §13-13-275-7. The agreed upon mitigation would include construction of the bridges consistent with the agreed upon design, archaeological monitoring during construction, and rehabilitation or salvage materials and reconstruction of the culvert headwall and revetment. If cultural resources or human remains were inadvertently discovered during construction, the contractor would comply with State law and administrative rules for handling them. Consultation with the HI SHPO for the above effects is still ongoing and will be completed prior to project advancement.

3.9.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts to archaeological and historic architectural resources would be less than significant. The following measures would be implemented for the project:

- The Waiʻoli, Waikoko, and Waipā Bridges would be preserved in place. Special contract requirements would be incorporated into the project to ensure no inadvertent damage occurs to these structures.
- Archaeological monitoring would be performed during ground-disturbing activities. If cultural resources or human remains are inadvertently discovered, work would immediately cease and all laws and administrative rules would be followed.
- Project design elements would continue to be coordinated through final design with the project's consulting parties.
- FHWA-CFLHD would strive to avoid the roadway culvert's basalt and mortared stone feature approaching Bridge 2. However, if it is determined that potential damage is unavoidable, the feature would be documented with photographs, and materials would be salvaged and rebuilt to mimic their original appearance. If some stone is damaged beyond re-use, materials would be used for repair that match the old in design, color, texture, and other visual qualities and, where possible, materials, consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

3.10 Cultural Resources

3.10.1 Affected Environment

Consistent with the requirements of HRS Chapter 343, Cultural Surveys Hawaii (under contract to FHWA-CFLHD) conducted a cultural impact assessment (CIA) to evaluate the potential effect of the proposed project on cultural beliefs, practices, and resources. The assessment included archival research of relevant background history, *kaao* (legends), traditional *moolelo* (stories), *wahi pana* (storied places), *olelo noeau* (proverbs), *oli* (chants), *mele* (songs), traditional subsistence and gathering methods, and ritual and ceremonial practices. Ethnographic interviews were also conducted with persons knowledgeable about cultural resources, practices, and beliefs relevant to the study area. Consultation was received from the following individuals:

- Mike Ching, Hanalei business owner and *kamaʻāina* (native-born)
- Alan Fayé, Princeville Community Association
- David Helder, resident of Wainiha
- Julian Helder, resident of Wainiha
- Samson Mahuiki, President of the Waipā Foundation
- Barbara Robeson, long-time resident of Wainiha
- Jonathan Wichman, *kamaʻāina* of Haleleʻa Moku

The findings of the CIA are summarized below; a copy of the Draft CIA is provided in Appendix F.

Background for this project yielded the following results (presented in approximate chronological order)(CSH 2016):

> *Kaʻao* (fictional story) and *moʻolelo* (narrative about a historical figure) throughout Haleleʻa Moku correlate and validate cultural practices of the area. In the tale of *Hiʻiakaikapolipole and Malaehaʻakoa*, Hiʻiaka comes across the fisherman, Malaehaʻakoa. The *moku* (district) of Haleleʻa is known for its aquacultural resources such as fishing. The story validates the abundance of resources in the area then and now. It was Malaehaʻakoa who also notified Hiʻiaka of her sister's (Pele, the fire goddess) lover's (Lohiau from Hāʻena Ahupuaʻa) death.
>
> The *ahupuaʻa* (land division spanning from the mountain to the sea) of Lumahaʻi and Wainiha were known for their tales of the *menehune*, a legendary race of small people who were responsible for the construction of building fishponds, roads, and *heiau* (pre-Christian place of worship) in the evenings. Some say the *menehune* and the *mū* (legendary people of Lāʻau-haela-mai, Kauaʻi) were the original inhabitants of Kauaʻi until they were driven to the *mauka* (upland) sections of the island by the arrival of Hawaiians.
>
> A census in Wainiha Ahupuaʻa during the time of Kaumualiʻi listed 65 men of Lāʻau as *menehune*. The census also listed the following villages to be inhabited by *menehune*: Naue, Pāʻieʻie, Maunaloa, Paliʻeleʻele, Maunahina, Pōhakuloa, Opaikea, Hōmaikalani, and Lāʻau.
>
> According to Land Comission Award (LCA) documentation, the *moku* was heavily farmed in taro *loʻi* (irrigated terrace). Waiʻoli Ahupuaʻa yielded 154 *loʻi* along the Waiʻoli Stream. *Kula* (plain) lands were planted in sweet potatoes, yams, bananas, and sugarcane. Several claims included fishponds. Data taken concludes that the area was very productive agriculturally.
>
> A number of burials have been found throughout the Haleleʻa Moku coastline. State Inventory of Historic Properties (SIHP) # 50-30-03-1982 yielded three burials (McMahon 1995a), b); SIHP # -1988, consisted of three burials and five isolated human remains (Masterson et al. 1997); SIHP # -355 yielded two burials and isolated skeletal remains (Sullivan and Dega 2003); SIHP # 361, did not yield human remains, but a cultural layer which contained pre- and post-Contact artifacts (Chafee and Dega 2005). However, cultural layers have been known to also yield human remains. In 1992, SIHP # -1878 yielded 31 pre-Contact burials along with cultural deposits with fire pits, postholes, and an *imu* (underground oven) (Spear 1992). In 2003, monitoring was conducted and 11 burials were found.

3.10.2 Potential Impacts

Based on the preliminary results of the CIA, cultural practices are not expected to be affected by the proposed project. Cultural practices near the proposed project (should any occur) would be temporarily restricted during the construction period for safety reasons. All permitted activities would resume once the improvements have been completed.

Based on information gathered from the cultural and historic background, the Action Alternative has the potential to encounter Native Hawaiian burials and subsurface cultural layers. There is a high possibility of *iwi kūpuna*, or ancestral bones, that may be present based on previous cultural, historical, and archaeological research that was conducted as well as via community consultations. The community has voiced knowledge of burials being found on the beaches and dune lands. Some of the land to be disturbed is situated on soils classified as Beaches, a preferred sediment for the interment of the dead. Therefore, land disturbing activities during construction may uncover presently undetected burials and/or other cultural finds. Based on this potential, an archaeological monitor would be present during ground-disturbing activities and construction personnel would be informed of the possibility of inadvertent cultural finds, including human remains, and the appropriate protocols that shall be followed.

3.10.3 Avoidance, Minimization, and/or Mitigation Measures

No specific cultural practices are anticipated to be impacted. Based on information gathered from the CIA process, the Action Alternative has the potential to encounter Native Hawaiian burials and subsurface cultural layers. The following measures would be implemented for the project.

- Archaeological monitoring would be performed during ground-disturbing activities. If cultural resources or human remains are inadvertently discovered, work would immediately cease and all laws and administrative rules would be followed. Construction personnel would be educated on appropriate protocols in the event of an inadvertent discovery.

3.11 Social and Economic Resources

3.11.1 Affected Environment

This section describes social and economic considerations, including population and demographic characteristics, housing, employment and economy, community facilities, and transportation.

3.11.1.1 Demographics and Population

Table 3-13 shows the population and age characteristics of Kaua'i County and Census tract 401.04, Wainiha CDP (79250) (U.S. Census Bureau 2015). The percentage of persons under the age of 18 is higher in the demographic study area than Kaua'i County. Conversely, the percentage of persons 65 years and older is substantially lower than Kaua'i County.

TABLE 3-13
Population and Age Distribution

Geographic Area	Population	Age			
		Under 18	Percent	65 and Over	Percent
Kaua'i County	67, 090	15,233	22.7	9,985	14.9
Census Tract 401.04	1,344	272	20.2	152	11.3
Wainiha CDP (79250)	318	76	23.9	24	7.5

Source: U.S. Census 2015

Table **Error! Reference source not found.**3-14 displays the total number of households, the number of family households, the average household size, and the number of housing units for the County of Kaua'i, Census tract 401.04, and the study area (Wainiha CDP) (U.S. Census 2015). The percentage of family households in the study area is slightly higher than Census tract 401.04 and lower than Kaua'i County; however, the average household size is higher in the study area than in Census Tract 401.04 and Kaua'i County.

TABLE 3-14
Household and Housing Units

Geographic Area	Number of Households	Total Family Households	Percent of Family Households	Avg. Household Size
Kaua'i County	23,240	16,147	69.5	2.84
Census Tract 401.04	512	314	61.3	2.59
Wainiha CDP (79250)	110	69	62.7	2.89

Source: U.S. Census 2015

Approximately 48 percent of the occupied housing units in the study area were owner occupied, and approximately 52 percent were renter occupied in 2010, as shown in Table **Error! Reference source not found.**3-15 (U.S. Census 2015). The study area had a slightly lower percentage of owner occupied housing units and a higher percentage of renter occupied housing units than the larger census tract. Both the study area and Census tract 401.04 had higher percentages of renter occupied housing units than Kaua'i County. Vacancy rates in the study area were less than half of Census tract 401.04 and slightly less than Kaua'i County. The percentage of vacancies for seasonal, recreational, or occasional use units was about the same in the study area as the county in 2010 (about 14 percent), but Census tract 401.04 was substantially higher at 36.2 percent.

TABLE 3-15
Housing Occupancy

Geographic Area	Number of Housing Units	Occupied	Percent	Vacant	Percent
Kaua'i County	29,793	23,240	78.0	6,553	22.0
Census Tract 401.04	862	512	59.4	350	40.6
Wainiha CDP (79250)	135	110	81.5	25	18.5
		Owner Occupied	Percent	Renter Occupied	Percent
Kaua'i County		13,968	60.1	9,272	39.9
Census Tract 401.04		274	53.5	238	46.5
Wainiha CDP (79250)		53	48.2	57	51.8

Source: U.S. Census 2015

Based on 2010 U.S. Census data, the racial and ethnic composition of the study area differs from Kaua'i County somewhat in that there is a substantially higher percentage of people who identify themselves as white (U.S. Census Bureau 2015). There is also a slightly higher percentage of Native Hawaiian and Other Pacific Native Islander than the county. For purposes of this analysis, racial and ethnic minority groups are defined as being comprised of people who were categorized as non-white. The racial and ethnic categories used are White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race/Two or More Races, and persons of Hispanic/ Latino origin. Table 3-16 depicts the study area's racial and ethnic composition.

TABLE 3-16
Racial and Ethnic Composition

	Wainiha CDP	Census Tract 401.04	Kaua'i	Hawai'i
Total Population	318	1,344	67, 091	1, 360, 301
Population by Race				
American Indian and Alaska Native alone	0.3%	0.4%	0.4%	0.3%
Asian Alone	3.1%	6.3%	31.3%	38.6%

Black or African American alone	1.3%	0.3%	0.4%	1.6%
Native Hawaiian and Other Pacific Native Islander alone	15.1%	11.6%	9.0%	10%
Some other race alone	1.9%	1.2%	0.9%	1.2%
Two or more races	16.0%	17.1%	24.9%	23.6%
White alone	62.3%	63.0%	33.0%	24.7%
Hispanic or Latino Ethnicity				
Hispanic or Latino (of any race)	3.5%	5%	9.4%	8.9%

3.11.1.2 Employment and Income

According to the 2014 State of Hawai‘i Data Book, the average annual number of employed members of the civilian labor force was 688,820 statewide (average from 2009 to 2013). The average annual number of employed civilians on Kaua‘i was 34,748. Of workers 16 years of age and older commuting to work on Kaua‘i, 88.6% travel by car, truck, or van, with less than 0.01% using public transportation (U.S. Census Bureau 2015).

The largest employment industry on the island of Kaua‘i is the tourism industry (37%), followed by the retail trade (16%) and the educational, health and social assistance industry (13%) (U.S. Census Bureau 2015). Figure 3-11 depicts employment number by industry within the county.

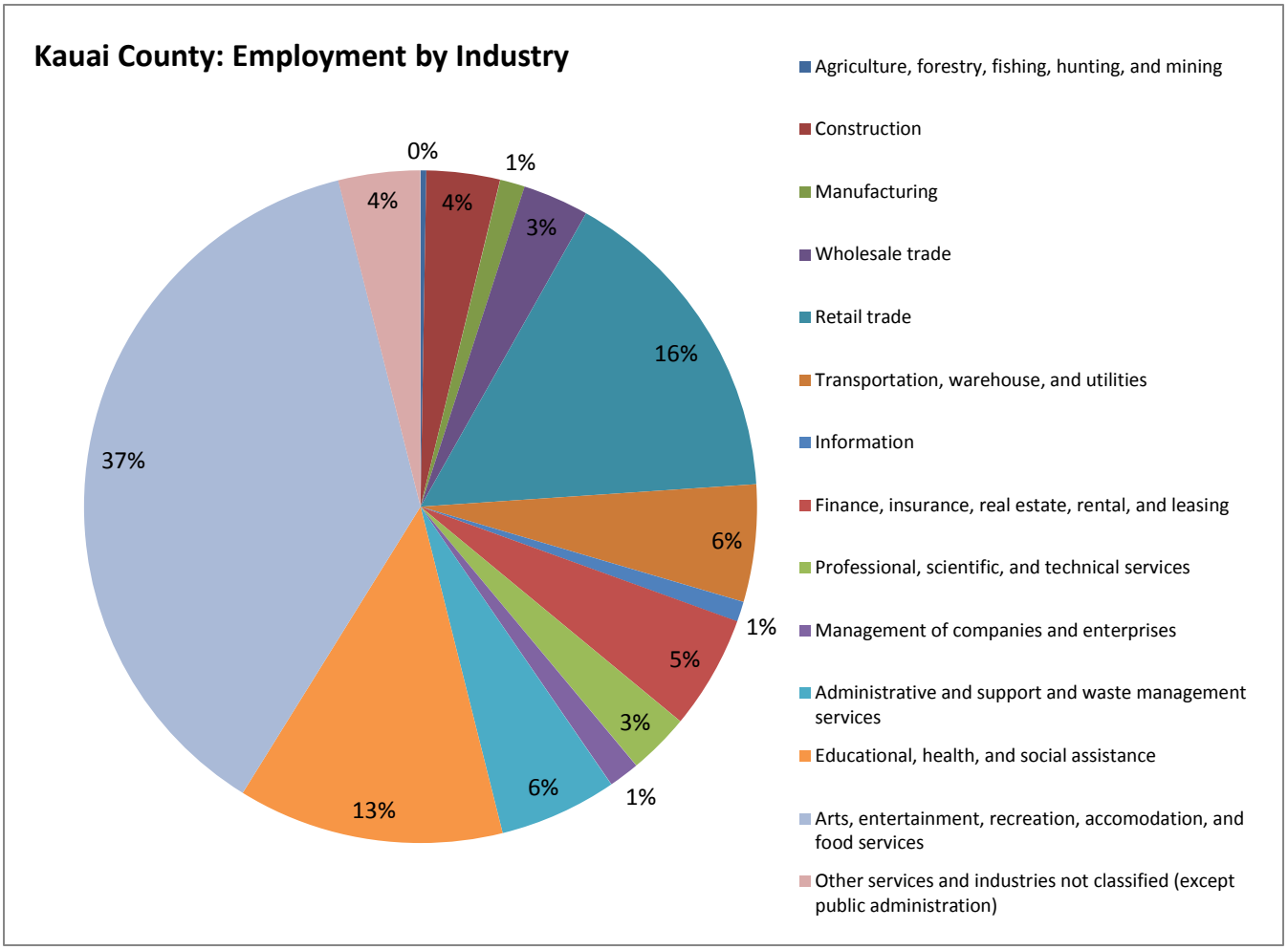

Figure 3-11. Kaua'i County Employment by Industry

Employment data is also available for the Wainiha CDP, though it has a high margin of error due to low response rates in the ACS survey. The 2009 – 2013 census ACS estimates that Wainiha has 58 civilians employed 16 years of age or older, in the labor force. Patterns are somewhat similar to the county, with the highest percentage of employment related to the tourism and arts and recreation industry. However, the construction industry represents the second highest employment percentage, which differs from the county level (U.S. Census Bureau 2015).

TABLE 3-17
Employment by Industry for Wainiha CDP

Civilian employed population 16 years and over	Total Population	Percent
Construction	13	22.4
Professional, scientific, and management, and administrative and waste management services	7	12.1
Educational services, and health care and social assistance	4	6.9
Arts, entertainment, and recreation, and accommodation and food services	20	34.5

Other services, except public administration	10	17.2
Public administration	4	6.9

Source: U.S. Census Bureau 2015

Tourism and recreation represent a majority of the industry on Kaua‘i and on the North Shore. Lodging is a major contribution to this category. Lodging accommodations and businesses located in the vicinity of the project area include the following:

- *Hanalei Colony Resort* – located at 5-7130 Kūhiō Highway (approximately ½ mile past the Wainiha Bridge 3 towards Hā‘ena). The property offers 48 rooms, and prices are generally between $279 and $459 per night. The property also offers an on-site restaurant and a day spa, included in businesses below.
- *Hale Ho’o Maha B&B* – located at 7083 Alamihi Road (approximately ½ mile past the Wainiha Bridge 3 towards Hā‘ena). The property offers four rooms and prices are generally $225 per night.
- *Kalalau B & B* – located at 4516 Uku Lii Place, approximately 1/2 mile past the Wainiha Bridge 3 towards Hā‘ena. The property offers three rooms and prices are generally between $75 and $135 per night.
- *Wainiha General Store* – located at 5-6607 Kūhiō Highway (approximately 1,000 feet east of Bridge 2, situated evenly between Bridges 1 and 2)
- *Sushi Girl Kaua‘i* - located at 5-6607 Kūhiō Highway (approximately 1,000 feet east of Bridge 2, situated evenly between Bridges 1 and 2)
- *Mediterranean Gourmet Restaurant* – located at 5-7132 Kūhiō Highway
- *Hanalei Day Spa*- independently-owned spa located in Hanalei Colony Resort

There are also residences that are offered as vacation rentals which are located near or past the project area. These include:

- River Estate – located at 5-6691, which offers two homes with daily and weekly rates offered, is accessed via a driveway immediately before travelers heading west enter Bridge 2.
- Hanalei Inn, located at 5-5468 Kūhiō Highway (about 700 feet east of the Wai‘oli Bridge), offers four rooms for approximately $150 per night.
- Hanalei Surfboard House, located at 5459 Weke Road (about 1,000 feet east of the Wai‘oli Bridge), offers two suites for approximately $350 per night.
- Hanalei Bay Inn, located at 5404 Weke Road, east of Wai‘oli Bridge.

In addition to the above, there are several additional homes offered independently as vacation rentals; some may be licensed while others may not be. A search of the area on the Vacation Rentals By Owner website resulted in 65 vacation home rentals located in the vicinity of the Wainiha Bridges. Most of these were located past the Wainiha Bridges towards Hā‘ena.

The median household income of Wainiha CDP is estimated, although there is a high margin of error. Median household income compared to the Census tract 401.04, Kaua‘i County, and the state of Hawai‘i is presented in Table 3-18. The median household income of the Wainiha CDP is 16.5% higher than the Census tract, but is 18.9% lower than the County of Kaua‘i.

TABLE 3-18
Median Household Income for Local, Regional, and Statewide Area

2009 – 2013 ACS Estimates	Wainiha CDP (79250)	Census Tract 401.04	Kaua'i County	State of Hawai'i
Median Household Income	$50,313	$42,031	$62,052	$67, 402

Source: U.S. Census 2015

3.11.1.3 Community Facilities

The following schools and other community facilities are located in the local and regional area.

Schools and Libraries

- Hanalei Elementary School – located at 5-5415 Kūhiō Highway, Hanalei (approximately 1,275 feet east of Wai'oli Bridge)
- Menehune School (preschool) – located 5-5428 Kūhiō Highway, Hanalei (approximately 1,165 feet east of Wai'oli Bridge)
- Aloha School Early Learning Center (preschool) – located at 5-5344 Kūhiō Highway, Hanalei (approximately 2,100 feet east of Wai'oli Bridge)
- Princeville Public Library – located at 4343 Emmalani Drive, Princeville

Emergency Providers

County of Kaua'i Fire Department, Hanalei Fire Station – located at 5-4390 Kūhiō Highway, Princeville

County of Kaua'i Police Department-Hanalei – located at 5-4290 Kūhiō Highway, Princeville

Post Offices

U.S. Post Office, Hanalei – located at 5-5226 Kūhiō Highway, Hanalei

Medical Facilities

North Shore Medical Center – located at 2490 Oka Street, Kilauea

Mahelona Medical Center (nearest emergency room) – located at 4800 Kawaihau Road, Kapaa

The location of several of these essential community facilities are mapped below in Figure 3-12.

Figure 3-12. Community Facilities Nearest Project Area

Other Community Facilities and Places of Worship

- Waipā Foundation – located at 5-5785A Kūhiō Highway (situated between and approximately 1,200 feet from Wai'oli and Waipā Bridges). This a non-profit organization maintains a Native Hawaiian learning **center** and community **center** at this location to connect folks with the 'aina (that which feeds us-land & resources) sharing local values and lifestyle through laulima (many hands working together).
- Amazing Grace Baptist Church – located at 5-5415 Kūhiō Highway (approximately ¼ mile east of Wai'oli Bridge)
- Wai'oli ui`ia Church – located at 5-5363A Kūhiō Highway (approximately 1/3 mile east of Wai'oli Bridge)
- St. William Church – located at 5-5292A Kūhiō Highway (approximately ¾ mile east of Wai'oli Bridge)

3.11.1.4 Traffic, Circulation, and Access

Route 560, Kūhiō Highway, is classified by HDOT as a minor arterial, and is a significant route serving the North Shore of Kaua'i. The road is a conventional two-lane highway with a lack of shoulders the majority of the route, and is interspersed with a series of seven one-lane bridges. The one-lane bridges begin with the Hanalei Bridge to the east/south and continue towards Hā'ena with the Wai'oli, Waipā, Waikoko, Bridges 1, 2, and 3, in order from east to west. Kūhiō Highway is the sole lifeline between the Hā'ena, Wainiha, Hanalei, and Princeville communities, and provides critical access to places of work, school, businesses, community services, and places of worship, as well as providing access to the area's abundant recreational opportunities. The ADT on the route at the project site is approximately 3,790 vehicles per day. Bicycles are allowed on the entire length of Kūhiō Highway, although there are no dedicated bicycle lanes.

Public transportation services on a fixed schedule are not available within the immediate project area. Kaua'i Bus, a county-provided transportation service offers the northern/westernmost stop on the North Shore of Kūhiō Highway near the Old Hanalei Courthouse, east of the Wai'oli Bridge. The county also offers a Paratransit (door-to-door) service from Hanalei for individuals who qualify and are registered, such as the elderly and those with special accessibility needs.

The project area is served by school buses for the local public schools with a bus stop located on Ala Eke Road, between Bridges 2 and 3. The school bus also proceeds through the project area past Bridge 3 towards Hā'ena bus stops.

3.11.2 Potential Impacts

3.11.2.1 No Action Alternative

Under the No Action Alternative, the existing ACROW bridges would remain and the ongoing operational and visibility issues would continue. No effects are anticipated as a result of the No Action Alternative.

3.11.2.2 Action Alternative

No changes in population or demographics would be associated with the Action Alternative. Replacement of the temporary bridges would provide long-term operational and aesthetic improvements to the area. The proposed design would not change the vehicle types or loads able to access the Hā'ena area, as the current ACROW bridges already accommodate sufficient loads. The rail-to-rail width of the proposed new bridges (14 feet) is very similar to the existing ACROW bridges (ranging from 12 to 14 feet); therefore the project would not contribute to increased traffic or changed vehicle mix.

Due to the temporary nature of the impact, measurable economic impacts from changes in employment and business activity are not anticipated. There may be a temporary boost in construction-related employment and income. With a preliminary estimated cost of $20 to $25 million, the project is expected to support a number of construction workers for the duration of the project. Unless the economy expands and existing firms are working at full capacity, this project is more likely to help sustain existing employment and income levels than to create new jobs. However, because project funds are coming from (Federal) sources outside the region, wages paid to workers on this project (direct income), payments to suppliers (indirect income), and their subsequent expenditures (induced income) would have a positive impact as monies circulate through the local economy.

The Action Alternative would not displace any retail, industrial or commercials uses; therefore, no direct impacts to sales tax revenues are anticipated. Some lodging and vacation rentals may experience reduced business during construction and temporary closure periods; however, this would be somewhat offset by the likely contribution of project construction staff to the local economy (through lodging, purchase of food, local supplies, etc.). A minor amount of permanent right-of-way may be required at Bridges 2 and 3, but this represents a negligible portion of the total taxable land in the project. Impacts to property tax revenue are therefore not anticipated.

Traffic, Circulation, and Access

Through providing temporary bypasses during construction, access along Kūhiō Highway would be maintained for the most part during construction. Specific construction sequencing is not known until a construction contractor is procured, but for purposes of this EA a worst-case scenario is assumed from 6 to up to 12 full roadway closures. This may involve night work from 6 to up to 12 nights to minimize impacts to the traveling public. Waipā and Wai'oli bridges may require a roadway closure of up to a half-day at each location. Waikoko Bridge may require a closure of one to two days. The Wainiha Bridges would also likely require a full one day closure for each location. Opportunities would be sought to consolidate closures and schedule night work, when possible, to minimize impacts of roadway closures. A traffic management program and traffic control plan would be developed for the project. It would include a public outreach program in concert with the contractor to include public meetings, outreach on timing of delays and closures, and coordination with the public, Kaua'i visitor industry, schools, and emergency services. Advanced notification of expected delays/closures through mailings, newspaper, radio announcements, etc. would also be required. Provisions for local access would be provided during these closures, when practicable. Project sites would also be coordinated with emergency responders and staged in a manner so that emergency access, if required, could be provided. School buses would also be accommodated, and school bus stops would be safely maintained.

3.11.3 Avoidance, Minimization, and/or Mitigation Measures

No long-term adverse effects are anticipated to social and economic resources, including access to social and recreational opportunities. Construction of the proposed improvements is expected to cause temporary disruption to traffic, depending upon the time of travel. This, in turn, can delay or disrupt people's access to school, work, recreation, and other activities. Impacts would be less than significant with the following measures being implemented to minimize the short-term project effects:

- Adequate notification of construction related delays and short-term closures would be provided to the traveling public, local government, and emergency service providers.
- A Traffic Management Plan would be developed and implemented for the project that would identify the location and timing of temporary road closures and delays, signage use and placement, and advanced notification procedures. The plan would also include an Emergency Services component that specifies how the contractor shall maintain access in the event of an emergency.
- A Public Involvement Program would also be developed and implemented in coordination with the contractor. The program would involve extensive public outreach to ensure the public, landowners, businesses, tourism industry, emergency services providers, schools, and local government officials are aware of project activities and scheduling of roadway closures and delays.
- Construction activities would be sequenced and scheduled, when possible, during periods of lower traffic volumes to minimize impacts to the traveling public.

3.12 Environmental Justice

3.12.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines.

3.12.2 Affected Environment

According to the *CEQ's Environmental Justice: Guidance Under the National Environmental Policy Act (EJ Guidance for NEPA)*, a population is identified as minority if "either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." The term "meaningfully greater" is not defined in this guidance.

CEQ and DOT define minority as persons self-identifying as any one of the following U.S. Census categories for race and ethnicity: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or Hispanic (USDOT 2011). Additionally, for the purposes of this analysis, minority also includes all other non-white racial categories that were added in the most recent Census, such as "some other race" and "two or more races." As shown in Table 3-19, the study area does not meet the definition of a minority population as defined by CEQ. Neither the Census tract nor CDP in the study area is 50 percent minority, and the percentage of minorities is less than that of the county and the state.

TABLE 3-19
Percent Minority

Geographic Area	Total Population	Minority	
		Number	Percent of Total Population
State of Hawai'i	1, 360, 301	1,050,958	77.26
Kaua'i County	67, 090	46,479	69.28
Census Tract 401.04	1,344	511	38.02
Wainiha CDP (79250)	318	123	38.68

Source: US Census 2015

CEQ and DOT define "low income populations" as persons whose median household income is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines (USDOT 2011). The HHS estimated the poverty level in 2016 for a family of three in Hawai'i to be $23,190. Census tract 401.04 has an average household size of 2.59 persons and median household income of $42,031. The Wainiha CDP has an average household size of 2.89 persons and median household income of $50,313. There is a high margin of error for the Wainiha CDP likely due to low response rates. However, the median household income of each geographic area measurably exceeds the HHS poverty level and does not meet the CEQ and DOT definition of a low-income population.

TABLE 3-20
Income and Poverty

Geographic Area	Median Household Income	Individuals with Income Below Poverty Level
		Percent
Kaua'i County	$62,052	11.2
Census Tract 401.04	$42,031	16.9
Wainiha CDP (79250)	$50,313	Unknown

Source: U.S. Census Bureau 2015

3.12.3 Potential Impacts

3.12.3.1 No Action Alternative

The No Action Alternative would provide no long-term improvements to the roadway. No adverse effects would result, nor would the beneficial operational improvements from the addition of more reliable, long-standing structures.

3.12.3.2 Action Alternative

No minority or low-income populations have been identified that would be adversely impacted by the proposed project as determined above. Therefore, in accordance with the provisions of E.O. 12898 and FHWA Order 6640.23, no further environmental justice analysis is required.

Both the long-term beneficial effects of the project, as well as short-term construction impacts, including air, noise, dust, and traffic impacts, would be distributed evenly among all populations.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the Action Alternative would not cause disproportionately high and adverse effects on any minority or low-income populations per EO 12898 regarding environmental justice.

3.13 Visual and Aesthetic Resources

3.13.1 Affected Environment

The 2000 *Kauaʻi General Plan* (*Kauaʻi General Plan*) identifies important scenic resources, such as important land forms; open spaces, parks, and conservation; scenic roadway corridors; resource parks and sites; federal and State natural preserves; and viewing points. The Kauaʻi General Plan North Shore Planning District Heritage Resources map was reviewed to identify resources that may be affected by the project.

The existing ACROW temporary bridges are located on Kūhiō Highway, State Route 560, which has sections identified as scenic roadway corridor west of Princeville, including the section from approximately Waiʻoli Stream, west of Waipā, past Limahuli Gardens, and to just east of Kēʻē Beach. Additionally, Kūhiō Highway is on the National Register of Historic Places (added to the register in 2004); however, the existing ACROW bridges are non-contributing features of the Kauaʻi Belt Road (North Shore section) district (HDOT 2012).

The *Kauaʻi General Plan* (County of Kauaʻi 2001) discusses the rural nature of development and small scale of Kauaʻi roads, stating the following:

> *Kauaʻi's rural character lies not just in those lands classified as "rural" or "agriculture". Rather, it lies in how the whole island fits together – the relationship of urban settlements to open lands, how the built-up areas relate to the natural features of the landscape, how people get around. Some important elements of Kauaʻi's physical environment:*
>
> - *Small towns and communities that have a distinct character and are compact rather than spread out.*
> - *Wide expanses of open lands – natural areas and lands in active cultivation – provide separation between the towns and communities. The rhythm of communities alternating with open lands is pleasing; and the separation highlights the special identity of each community.*
> - *Buildings are relatively small in scale and low in height, complementing rather than dominating the landscape.*
> - *The relatively small scale of Kauaʻi roads, the presence of natural vegetation along the roads, and the absence of medial concrete barriers.*
>
> *Kauaʻi is a place of great natural beauty and green open spaces, valued by residents and visitors alike. Rural and urban development are carefully planned and regulated to ensure that Kauaʻi continues to be "The Garden Island."*

The original Wainiha Bridge 1, Bridge 2, and Bridge 3, were constructed 1922, 1931, and 1931, respectively (HDOT 2013). The bridges were replaced in 1957—in response to the destructive tidal wave that stranded residents on the west side of the Wainiha Stream—with low-profile, white-painted bridges. Subsequently, Bridge 1, Bridge 2, and Bridge 3 were replaced with a temporary ACROW panel bridge in 2007, 2004, and 2007, respectively (HDOT 2012).

The three existing temporary ACROW bridges (Wainiha Bridge 1,Wainiha Bridge 2, and Wainiha Bridge 3) are located along the North Shore of Kauaʻi, a rural environment of towns separated by broad open spaces on the coastal plain. The three bridges are located between mile posts 6.4 and 6.7 near the mouth of Wainiha River before it feeds into Wainiha Bay. Bridge 1 is located over Wainiha Stream, while Bridges #2 and #3 are

over Wainiha River. Neither river nor stream are designated as Special in the *Kaua'i General Plan* (County of Kaua'i 2001). The land surrounding the bridges is not substantially developed, and extensive vegetation growth inhibits views.

The nearest occupied structures in the vicinity Bridge 1 are the Wainiha Beach House, a bed and breakfast (located immediately southwest and *mauka* [toward the mountain] of Kūhiō Highway), and a private property located immediate east and *makai* (toward the ocean) of Kūhiō Highway. Wainiha Bay is approximately 475 feet *makai* of Kūhiō Highway and visible from the Bridge 1; therefore, the bridge is visible by users of the beach. Boaters on Wainiha River have a view of the bridges; however, the greatest number of viewers are those users of Kūhiō Highway.

The nearest occupied structures in the vicinity of Bridge 2 and Bridge 3 are the private properties south and west (*mauka*) of Kūhiō Highway. Wainiha Bay is approximately 1000 feet *makai* of Kūhiō Highway from the Bridge 2 and approximately 950 feet *makai* of the highway from Bridge 3 but, because of the bend in Wainiha stream near its mouth, the bridges are not visible by users of the beach. Boaters on Wainiha River have a view of the bridge; however, the greatest number of viewers are those users of Kūhiō Highway.

Photo 1 shows a view of the existing Wainiha Bridge 1 from the eastern approach, looking west. Photo 2 shows a view the existing Bridge 2 from the eastern approach, facing west. Photo 3 shows a view of the existing Bridge 2 and existing Bridge 3 from the highway east of the bridges, facing west. Photo 4 shows a view of the existing Bridge 3 from the Wainiha River, facing southwest.

Historical photographs from the Engineering Design Report (HDOT 2012) of the low-profile, white-painted bridge that previously spanned the Wainiha River and Stream at the locations of Bridges 1, 2, and 3 are provided in Photos 5, 6, and 7, respectively.

Temporary staging would occur at each bridge location, and two potential staging areas are also located in the project area. Additionally, three historical one-lane bridges along Kunio Highway, located at Wai'oli, Waipā, and Waikoko Streams, would be crossed during delivery of construction loads (e.g., heavy equipment, materials, and waste). These historical bridges have low load capacities.

Photo 1: View of existing Wainiha Bridge 1 from eastern approach, *makai* side, looking west toward Hā'ena (from Kūhiō Highway).

Photo 2: View of existing Wainiha Bridge 2 from the eastern approach, *makai* side, looking west toward Hā‘ena (eastern end of Wainiha Bridge 2 is visible in the background on the right side of the photo) (from Kūhiō Highway).

Photo 3: View of existing Wainiha Bridge 2 (on the left) and Bridge 3 (on the right) from the highway near the eastern approach to Bridge 2, *makai* side, looking west toward Hā‘ena (from Kūhiō Highway).

Photo 4: View of existing Wainiha Bridge 3 from Wainiha River, *makai* side, looking southwest, upstream (a drill rig is in front of the bridge).

Photo 5: View of historical Bridge 1 from western approach, *makai* side, looking east toward Lihue (before replacement with ACROW bridge in 2007) (HDOT 2012)

Photo 6: View of historical Bridge 2 from western approach, *mauka* side, looking east toward Lihue (before replacement with ACROW bridge in 2004) (HDOT 2012)

Photo 7: View of historical Bridge 3 from western approach, *mauka* side, looking east toward Lihue (before replacement with ACROW bridge in 2007) (HDOT 2012)

3.13.2 Potential Impacts

3.13.2.1 No Action Alternative

Under the No Action Alternative, no improvements would be made to Wainiha Bridge 1, Bridge 2, and Bridge 3 (ACROW bridges) beyond minor spot improvements and routine maintenance, and the ACROW bridges would remain in the existing condition and location. Deficiencies of the existing three bridges, which include the impaired visibility from the closely spaced, tall beams and higher roadway elevation, would persist.

The No Action Alternative would not result in activities or operations that would affect environmental resources; however, no improvements to the viewshed would occur as the industrial looking ACROW bridges would remain at the crossings. Furthermore, operating and maintaining the ACROW structures as permanent crossings is inconsistent with the intent of original placement of the ACROW bridges. The

ACROW bridges were installed as temporary solution and were not intended to serve as a permanent design solution.

3.13.2.2 Action Alternative

The proposed project (removal and replacement of the temporary ACROW bridges) would result in visual changes to the project area, as shown in the visual simulations in Simulations 1 and 2; the features of the new bridges would be substantially similar in character to the previous historical bridges shown in Photos 5, 6, and 7. The new railing design would somewhat echo the character of the historic pre-ACROW bridges' railings. The design for the railing for proposed Wainiha Bridge 1, Bridge 2, and Bridge 3 is low-profile and light-colored to mimic the low-profile, white-painted look of the historical bridges, while meeting current safety standards. The proposed design for the Bridge 1 railing is the same as shown in the simulations prepared for Bridges 2 and 3.

Simulation 1: Simulation of proposed Wainiha Bridge 2 (on the left) and Bridge 3 (on the right) from the highway near the eastern approach to Bridge 2 looking west toward Hā'ena (from Kūhiō Highway)

Simulation 2: Simulation of proposed Wainiha Bridge 3 from Wainiha River looking southwest (upstream)

From the view points of the photographs used to prepare the simulations, the new permanent bridge railing would be the most noticeable change compared to existing conditions at Bridges 1, 2, and 3. The proposed railing design would be a benefit to the view, would be in keeping with the County of Kaua'i's desire for structures to complement rather than dominate the landscape.

Other project features, such as lane-width alterations, would be even less noticeable when compared to existing conditions. Frequent bridge users may notice that the bridge is slightly narrower overall, with a slightly wider travel lane. Some community members have expressed interest in the travel surface on the bridge deck to mimic the timber travel surface of the historic pre-ACROW bridges. The proposed project would include a concrete deck treated to offer a timber-like appearance. This would be an improvement over the No Action Alternative, but would differ from historic pre-ACROW conditions. Travelers on the bridge deck would notice the surface for the short period required to cross the bridge, but the bridge deck is not visible from the river or stream nor from the beach. These other visual changes because of replacement of the ACROW bridges would be considered minimal and would not result in an adverse effect to the quality of views from or toward the bridges.

The project would not result in a substantial change to the existing landscape or result in a noticeable change to the project viewshed because the changes would be relatively minimal in scale and scope. Nearby beach users potentially would have a prolonged view of Bridge 1 but their attention is generally focused primarily to the north (*makai*). Similarly, users of the river or stream could remain near the bridges for longer periods compared to roadway travelers, but users of the river or stream would not be expected to remain in the vicinity of the bridge for a protracted amount of time. Views from the bridge would be improved with the removal of the ACROW bridges and construction of a lower railing on the new bridges, resulting in an overall beneficial impact.

The project could result in temporary visual impacts during the construction period as a result of dust, heavy equipment at the project site, and the temporary installation of the ACROW bridges adjacent to Bridges 1, 2, and 3 for use as bypass access during construction. Additionally, temporary one-lane bridges would be installed adjacent to or crossing over the three historical one-lane bridges along Kūhiō Highway at Wai'oli, Waipā, and Waikoko Streams to accommodate construction loads and could result in temporary visual impacts during the construction period. These temporary impacts during the construction period would be minimal, and no specific mitigation is required. The temporary bridges would be removed upon completion of the project, and temporarily disturbed areas would be revegetated with non-invasive plant species appropriate for the project area.

3.13.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts from the Action Alternative would be less than significant as there would be a long-term visual improvement over the existing conditions. Short-term, adverse impacts would result from construction and would be minimized through avoidance and minimization measures. The following measures would be implemented to address visual quality:

- Aesthetic design elements would continue to be coordinated with the project consulting parties through final design.
- Temporary bridges, bypasses, and other constructed elements would be removed upon completion of the project. Temporarily disturbed areas would be re-vegetated with non-invasive plant species appropriate for the project area.

3.14 Parks, Recreation Facilities, and Section 4(f) Properties

3.14.1 Affected Environment

Tourism and recreation is a substantial contribution to the economy. The magnificent views, shoreline expanses, and swimming and undeveloped beaches of the North Shore are what bring many visitors to Kaua'i. The following parks and recreational areas are located in the vicinity of the project area.

- *Wainiha Bay Beach Park* – 23.6-acre undeveloped beach park owned and managed by the County of Kaua'i. A portion of this park is located immediately adjacent to the Wainiha Bridges.
- *Wai'oli Beach Park* – 6.41-acre beach park with comfort station and picnic area
- *Hā'ena Beach Park* – 8.1-acre park with pavilion, comfort stations, picnic and camping, and lifeguarded beach.
- *Hā'ena State Park* –Approximately 65.7-acre state wild-land park at the end of Kūhiō Highway. This park is an extremely popular destination, and it contains restrooms, comfort station, picnic areas, and lifeguarded beach. It is home to the popular Ke'e swimming beach and is the North Shore access to the 11-mile Kalalau Trail along the Nāpali coast.

Access along Kūhiō Highway near the project area is also provided to the following additional beaches that lack amenities: Makua (Tunnels) Beach, Lumahai Beach Park, Kepuhi Beach.

An additional recreational and educational attraction located past the Wainiha Bridges is the *Limahuli Garden and Preserve*, located at 5-8291 Kūhiō Highway. It is a tropical botanical garden, preserve, and visitor of the not-for-profit National Tropical Botanical Garden, whose mission is to enrich life through discovery, scientific research, conservation, and education by perpetuating the survival of plants, ecosystems, and cultural knowledge of tropical regions.

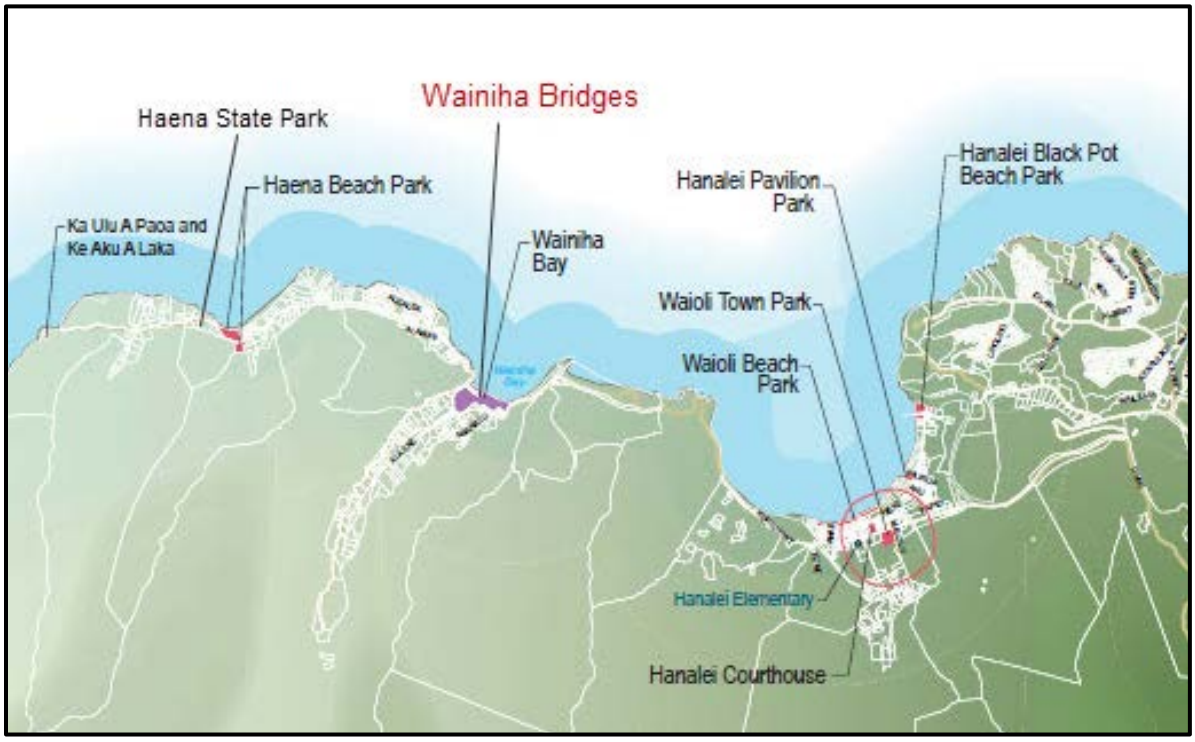

Figure 3-13. Parks in the Vicinity of the Wainiha Bridges

3.14.1.1 Section 4(f) Considerations

Section 4(f) of the U.S. Department of Transportation Act of 1966 declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

The legislation further states that "the Secretary shall not approve any program or project (other than any project for a Federal lands transportation facility) which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials unless

(1) there is no feasible and prudent alternative to the use of such land, and

(2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use.

FHWA's implementing regulations for Section 4(f) are included in 23 Code of Federal Regulations (CFR) 774. These regulations further define what qualifies for Section 4(f) protection and what constitutes a Section 4(f) *use*. A Section 4(f) property is publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance.

A Section 4(f) *use* is defined, except as set forth in 23 CFR 774.11 and 774.13:

(1) When land is permanently incorporated into a transportation facility;

(2) When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose as determined by the criteria in §774.13(d); or

(3) When there is a constructive use of a Section 4(f) property as determined by the criteria in §774.15.

Section 4(f) Properties

The Kaua'i Belt Road, North Shore Section, is listed in the National Register of Historic Places as a historic district. This resource, therefore, qualifies for Section 4(f) protection.

Wainiha Bay Beach Park is a publicly-owned beach park managed by the County of Kaua'i. Although this park is undeveloped, it offers unrestricted public access to secluded beach, fishing, and enjoyment of the natural and "wild" waters of Wainiha Bay. It is officially designated as a park in the Kaua'i Parks and Recreation Master Plan (2013). Therefore, this resource is presumed to qualify for Section 4(f) protection.

Applicability of Section 4(f) Exceptions

FHWA has identified various exceptions to the requirement for Section 4(f). At this point in project development planning, FHWA-CFLHD anticipates applying a Section 4(f) exception to each of the Section 4(f) properties. As the project design advances and consultation is completed with the officials with jurisdiction over the respective resources, FHWA-CFLHD will confirm the applicability of the exceptions and ensure that all criteria are met. Section 4(f) exceptions will be fully documented prior to agency project approval.

Kaua'i Belt Road:

As discussed in section 3.9, the Action Alternative would result in a *no adverse effect* determination for the NRHP-listed Kaua'i Belt Road. This finding has been submitted to the HI SHPO. The exception identified in 23

CFR 774.13, which states that the requirement for Section 4(f) approval is excepted if rehabilitation or maintenance of NRHP-listed or eligible transportation facilities are not adversely affected, will apply insofar as the SHPO does not object to this conclusion. FHWA-CFLHD will ensure all appropriate Section 4(f) documentation is complete prior to project approval.

Wainiha Bay Beach Park:

Temporary occupancies of land that are so minimal as to not constitute a use within the meaning of Section 4(f) are also excepted from Section 4(f) evaluation. The following conditions must be satisfied and are anticipated for this project:

(1) Duration must be temporary, *i.e.*, less than the time needed for construction of the project, and there should be no change in ownership of the land;

(2) Scope of the work must be minor, *i.e.*, both the nature and the magnitude of the changes to the Section 4(f) property are minimal;

(3) There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;

(4) The land being used must be fully restored, *i.e.*, the property must be returned to a condition which is at least as good as that which existed prior to the project; and

(5) There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

3.14.2 Potential Impacts

3.14.2.1 No Action Alternative

The No Action Alternative would not provide for permanent Wainiha Bridges, rather there would be continued maintenance of the existing structures. There would be no effects to parks and recreation resources under this alternative.

3.14.2.2 Action Alternative

The Action Alternative would construct new bridges that closely match the existing alignment. The existing Wainiha temporary bridges would be temporarily relocated *makai* to accommodate traffic during construction of the new bridges. This would require temporary occupancy of Wainiha Bay Beach Park land outside of the existing DOT right-of-way. This would involve minor clearing, grubbing, and ground disturbance for the installation of temporary abutments, approaches, and placement of the ACROW bridges. The duration of the occupancy will be less than the overall time needed for construction, and there would be no anticipated permanent adverse physical impacts as the site would be restored upon completion of the project. There would be no protected activities, features, and attributes of the park that would be interfered as the occupancy would occur outside of the beach area where recreation occurs. There are no features of the park affected that would interfere with the public's opportunity to enjoy the resource. No permanent right-of-way is anticipated from Wainiha Bay Beach Park. Coordination would continue with the county to obtain documented agreement with these findings.

Delays, short-term closures, and isolated full-day closures would be required for the project. During certain project milestones such as relocating the ACROW bridges onto the temporary bypass alignment and constructing a temporary bridge over the Waikoko Bridge, access to nearby park and recreational facilities would be temporarily restricted for those on the other sides of the bridges. These instances would be minimal, scheduled to the extent possible during nighttime when impacts to the traveling public would be

reduced, and would be adequately relayed to local residents and the tourism industry. Due to the isolated and short-nature of the closures and implementation of a public outreach program, travelers would be able to plan appropriately to enjoy these amenities outside of the limited closure periods. Emergency services would be coordinated to ensure that emergency access would be maintained.

3.14.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts to parks and recreation resources would be less than significant. The project is being designed to minimize impacts to resources where practicable. Mitigation measures discussed in section 3.11 with regards to development of a traffic management plan and public involvement program that includes advanced notification of delays and/or scheduled closures would help park visitors plan accordingly. Temporarily impacted areas would also be restored and revegetated upon completion of the project.

3.15 Solid Waste Management

3.15.1 Affected Environment

The County of Kaua‘i, Department of Public Works, Solid Waste Division operates the primary refuse collection system. The County is responsible for regulating the disposal of all solid waste with the exception of hazardous materials. Refuse collection crews operate out of three baseyards on Kaua‘i. The island has a single landfill located in Kekaha. The 34-acre Kekaha Landfill Phase II site opened in 1993 and was allowed by the State to have its height limit increased to 60 feet in 1998. The facility also serves as a drop-off point for segregated recoverable waste (such as cardboard, newspaper, glass, and aluminum cans). The landfill, with the addition of the vertical expansion, is projected to reach capacity in several years. The County has identified a landfill site north of Lihue, *makai* of Maalo Road, and is currently preparing an EIS.

3.15.2 Potential Impacts

3.15.2.1 No Action Alternative

The No Action Alternative would not involve any construction and would have no associated solid waste impacts.

3.15.2.2 Action Alternative

Solid waste impacts are expected to be short-term and related to construction activities. Removing the existing bridge would generate debris consisting primarily of concrete slabs, asphalt pavement, and metal guardrails, posts, and fastenings. Much of the existing ACROW structures could be retained for future HDOT use. The contractor would be required to dispose of or recycle all materials at approved sites and with proper handling during transport. Project related waste material would be a small proportion of the island-wide total, and is not expected to have a significant impact on the County’s solid waste facilities.

3.15.3 Avoidance, Minimization, and/or Mitigation Measures

No significant adverse effects are anticipated; therefore, no specific mitigation would be required. Avoidance and minimization measures would involve the following:

- The contractor would be required to appropriately handle, transport, and recycle and/or dispose of project materials in accordance with local, state, and Federal regulations.

3.16 Real Property and Utilities

3.16.1 Affected Environment

3.16.1.1 Real Property

Existing transportation right-of-way varies throughout the project area from between a few feet to approximately 40 feet beyond the edge of pavement. The following tax map key parcels are located in the area of potential direct impact. They include:

- Wainiha Bridge 1: [4] 5-8-002:002 por.; [4] 5-8-006:030, 031, 032, 033, 046, 060, and 999 por.
- Wainiha Bridge 2-3: [4] 5-8-006:009, 011, 017, 018, 019, 030, 999 por.; [4] 5-8-007:023, 024, 031, 032, 999 por.
- Waiʻoli Bridge: [4] 5-5-005:005, 007, 021, 028, 999 por.; [4] 5-5-006:014, 888 por.; [4] 5-6-002:002, 004, 999 por.
- Waipā Bridge: [4] 5-6-004:014, 022, 023, 999 por.
- Waikoko Bridge: [4] 5-6-003:002, 999 por.
- Potential Staging Areas 1 and 2: [4] 5-7-003:003, 999 por.

3.16.1.2 Utilities

Existing utilities are present in the project area, which include water, telephone, electrical, and cable. Overhead power lines run adjacent to the bridges, and water and fiber optic occur across that actual bridges at several locations. The following companies or agencies maintain utilities in the project area:

- Kauaʻi Department of Water
- Hawaiian Telcom
- Kauaʻi Island Utility Cooperative
- Oceanic Time Warner Cable

3.16.2 Potential Impacts

3.16.2.1 No Action Alternative

The No Action Alternative would not involve any construction; as such, there would be no conflicts with utilities and no right-of-way impacts.

3.16.2.2 Action Alternative

Real Property

Right-of-way impacts are approximated due to the project being in preliminary design, and would be further refined as design progresses. New permanent right-of-way needs would be restricted to three localized areas on the *mauka* side of Bridges 2 and 3, and would be minor at approximately 0.21 acre affecting five parcels. No permanent right-of-way is anticipated at Bridge 1. Due to the narrow transportation right-of-way and the proposal to provide temporary alignments adjacent to the existing bridges at many locations, several temporary construction parcels would be needed to accommodate temporary construction activities. No relocations would be necessary, and no buildings would be impacted. The table below lists the approximate potential permanent and temporary right-of-way impacts for the project.

TABLE 3-21
Approximate Right-of-Way Requirements

TMK	Property Owner	Estimate of Area Needed (Acres)
Bridges 2&3		
(4) 4-5-8-006:030	County of Kauaʻi	0.6 (temporary)
(4) 4-5-8-006:011	Foster & Barbanell	0.04 (temporary) 0.02 (permanent)
(4) 4-5-8-006:009	Ching Family Partnership and Estate of Lawrence Ching	0.05 (temporary)

TMK	Property Owner	Estimate of Area Needed (Acres)
		0.03 (permanent)
(4) 4-5-8-007:999, Ala Eke Road	County of Kaua‘i	0.11 (temporary)
		0.02 (permanent)
(4) 4-5-8-007:024	Ching Family Trust	0.06 (temporary)
		0.08 (permanent)
(4) 4-5-8-007:023	Hannah Meyer and others	0.11 (temporary)
		0.06 (permanent)
(4) 4-5-8-007: 031	Rohn	0.004 (temporary)
(4) 4-5-8-006:019	Gelman	0.02 (temporary)
(4) 4-5-8-006:018	Mahuiki	0.03 (temporary)
(4) 4-5-8-006:017	Branowicki	0.04 (temporary)
Total Bridge 2&3 Temporary		**1.1 acre**
Total Bridge 2&3 Permanent		**0.21 acre**
Bridge 1		
(4) 4-5-8-006:030	County of Kaua‘i	0.07 (temporary)
(4) 4-5-8-006-060	Howard & Patey	0.01 (temporary)
(4) 4-5-8-002:002	Robinson	0.08 (temporary)
(4) 4-5-8-006:032	Fireweed, LLC	0.05 (temporary)
(4) 4-5-8-006:033	Pfeffer	0.01 (temporary)
(4) 4-5-8-006:031	Kennelly Trust	0.01 (temporary)
Total Bridge 1 Temporary		**0.23 acre**
Waikoko Bridge		
(4) 4-5-6-003:002	Waikoko Land Corp.	0.15 (temporary)
Total Temporary		**0.15 acre**
Waipā Bridge		
(4) 4-5-6-004:022	BP Bishop Trust	0.44 (temporary)
(4) 4-5-6-004:023	BP Bishop Trust	0.06 (temporary)
(4) 4-5-6-004:014	Blair Family Trust	0.02 (temporary)
Total Temporary		**0.52 acre**
Wai‘oli Bridge		
(4) 4-5-5-005:021	State of Hawai‘i	0.03 (temporary)
(4) 4-5-5-005:007	Angulo Family Trust	0.02 (temporary)
(4) 4-5-5-005:028	Bendele	0.02 (temporary)
(4) 4-5-5-005:005	Watari	0.003 (temporary)
(4) 4-5-5-006:014	Ching Family Partnership	0.05 (temporary)
(4) 4-5-5-002:002	Kobayashi	0.09 (temporary)
(4) 4-5-5-002:004	Kobayashi	0.01 (temporary)
Total Temporary		**0.22 acre**

TMK	Property Owner	Estimate of Area Needed (Acres)
GRAND TOTAL PERMANENT		**0.21 acre**
GRAND TOTAL TEMPORARY		**2.22 acre**

Utilities

Early identification and coordination with utility owners has identified utilities within the project area. These utilities would need to be relocated during project construction, and where appropriate, carried across the new bridges once complete. Utilities would remain functional during construction, but may experience short-term interruptions, limited to the extent possible. Further coordination with utility owners would occur before and during construction. Temporary impacts on utilities would be negligible because service would be maintained during construction, and there would be no long-term adverse impacts related to utilities.

3.16.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts to real property and utilities would be less than significant. The following avoidance and minimization measures will apply to the project.

- FHWA-CFLHD would attempt to reduce and minimize the amount of right-of-way required for implementation of the Action Alternative. The following provisions would be implemented to ensure fair and consistent treatment:
    - Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (P.L. 91-646) as amended by the Uniform Relocation Act Amendments of 1987 (P.L. 100-17); and
    - 49 CFR Part 24, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-assisted Programs.
    - Implement a comprehensive community outreach program, including ongoing outreach and coordination with affected property owners to minimize the impacts of access disruption or alterations as part of both project design and during construction.
- Project design would continue to consider the effects to utilities. Conflicts with existing utilities would be minimized in design to the extent practicable. Coordination with utility providers would continue to ensure all conflicts are identified in design and necessary utility relocations are scheduled to minimize potential service disruptions.

3.17 Secondary and Cumulative Impacts

3.17.1 Secondary Impacts

Secondary impacts, or indirect effects, are effects that are caused by an action and are later in time or farther removed from distance, but are still reasonably foreseeable. Such efforts may include growth-inducing impacts and other effects related to changes in land use patterns, population density, or growth rate, and related effects on air, water, and other natural systems. The proposed project is expected to have minimal secondary impacts on resident population, land use patterns, public facilities and infrastructure, and the natural environment. The project is self-contained and would not lead to an increase in traffic volumes or a change in vehicle mix that may be associated with secondary impacts. The improvements would not generate secondary effects increasing infrastructure demands, necessitating offsite improvements, constraining public facilities, or influencing population growth.

Construction of the proposed project is expected to generate only minor short-term impacts. Creation of short-term construction jobs is not expected to generate a substantial number of workers. It is anticipated

that local contractors on Kauaʻi or within the State of Hawaiʻi would likely be used for construction of the proposed project. These workers would thus have minimal, if any, effect on the County's residential population or housing demand.

3.17.2 Cumulative Impacts

Cumulative impacts are effects on the environment that result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

The Action Alternative is a self-contained project that would have localized, short-term impacts that would be minor with implementation of avoidance and minimization measures. Short-term impacts associated with the Action Alternative primarily include noise, air-quality, biological resources, and temporary traffic disruptions. No measurable long-term, adverse effects are associated with the project.

Past residential development and land management activities in the project vicinity have likely incrementally and sporadically adversely affected cultural and natural resources. The Hāʻena State Park has noted strain on resources within their park much of which may be attributed to the high number visitors. The DLNR, Division of State Parks published a Draft Environmental Impact Statement for the Hāʻena State Park Master Plan in July 2015. This plan, if implemented, would impose a visitor limit to the park and restore some of the parks' natural, cultural, and scenic resources. This would reduce the number of vehicles traveling to the park but may increase pressure on other surrounding parks. This, in turn, may reduce overall traffic traversing the Wainiha Bridges. As discussed earlier in this EA, a permanent rehabilitation or replacement project is also needed for the Waikoko, Waipā, and Waiʻoli Bridges. This project is in the early planning phase and would likely take several years to complete design. Neither implementation of a long-term project to address these three bridges, nor implementation of the Hāʻena State Park Master Plan is anticipated to occur concurrently with this proposed Wainiha Bridges project. The short-term impacts from construction of this project would therefore not be occurring in concert with any other known planned projects. If future improvements are implemented on the Waiʻoli, Waipā, and Waikoko bridges, these would involve similar short-term impacts but would also be an impact the NRHP-listed Kauaʻi Belt Road. This resource, with its multiple features along the road, is by its very nature vulnerable to incremental loss of integrity as modern improvements may be implemented. This Wainiha Bridges project (Action Alternative) would not contribute to overall adverse effects to the resource, even in concert with any other planned improvements, because the Action Alternative would not adversely affect the resource and would be more visually compatible with the historic district.

SECTION 4

Relationships to Plans, Policies, and Controls

The plans and policies relating to the proposed project range from broad program guidance to land use controls governing the project site. Construction of the proposed improvements is consistent with the various plans, policies, and regulatory controls, as discussed herein.

4.1 Federal

The proposed project would include the use of Federal funds through FHWA. As a result, the proposed project needs to be consistent with various Federal statutory and regulatory requirements.

4.1.1 National Environmental Policy Act of 1970

The proposed project would be partially funded by FHWA; this Federal funding subjects the project to the environmental review requirements of NEPA, prescribed under 40 CFR Parts 1500 – 1508 (Council on Environmental Quality [CEQ]). FHWA serves as the lead Federal agency, or Administrator, responsible for the project's compliance with NEPA documentation and processing requirements, as provided in 23 CFR 771, Environmental Impact and Related Procedures.

The NEPA determination of impact significance is related to the type of document and process required to comply with NEPA for a proposed project. There are three types of environmental documents under NEPA: (1) Categorical Exclusion (CE), (2) EA, and (3) EIS. A CE is appropriate where there are no significant impacts on the environment, an EA when the significance of the effects are not clearly established, and an EIS when the action would have a significant impact on the environment.

Significance is defined in the CEQ regulations (40 CFR 1508.27). A "significant impact" is assessed in terms of an impact's "context" and "intensity." Context refers to the environment and the level of relative abundance of resources in the project area. Intensity refers to the specific impact, or how much of the resource(s) would be used or affected by the project.

This EA has been prepared in compliance with NEPA.

4.1.2 Section 106 of the National Historic Preservation Act of 1966

The NHPA of 1966, as amended (PL 89-665, codified as 16 United States Code [U.S.C.] 470), recognizes the nation's historic heritage and establishes a national policy for the preservation of historic properties as well as the National Register of Historic Places. Section 106 of the NHPA (16 U.S.C. 470f) requires that Federal agencies consider the effects of their projects on historic properties. Use of Federal funds sets forth the need for Section 106 consultation. The purpose of the Section 106 consultation process is to evaluate the potential for effects on existing historic sites, if any, resulting from the project. Findings relating to historic properties are discussed in Section 3.9 of this document.

The Section 106 review process encompasses "good faith effort" in ascertaining the existence and location of historic properties near and within the project site, establishing an Area of Potential Effects (APE) of the project, identifying whether a potential for "adverse effects" on historic properties by the project exists, and developing a reasonable and acceptable resolution in the monitoring and treatment of any historic sites that is agreed upon by the agency, the State Historic Preservation Officer (SHPO), and consulting government agencies, community associations, and Native Hawaiian organizations and families.

Meetings were held with the SHPO on September 9, 2014, December 10, 2014, and March 12, 2015 to provide an overview of the FHWA-CFLHD Hawai'i Bridge Program, discuss the general parameters for historic preservation review, and discuss the preliminary design plans and possible effects and mitigation. The HI SHPO concurred with the Area of Potential Effect (APE) for the project in a letter dated December 18, 2015. Letters have been sent to potential consulting parties, and consultation is ongoing with consulting

parties who had an interest in participating in the process. The project was discussed with the Kaua'i Historic Preservation Review Commission in a meeting held on October 1, 2015, at a Kaua'i Island Burial Council meeting held on November 18, 2015, and in a meeting held with the Historic Hawai'i Foundation and SHPO on February 9, 2016. Consultation and coordination is also ongoing with the Hanalei Roads Committee.

Copies of the documents related to the Section 106 consultation process are provided in Appendix A. Consultation on the project will continue through project development and be completed by FHWA-CFLHD before its project approval.

4.1.3 Section 4(f) of the Department of Transportation Act of 1966

Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303 and 23 U.S.C. 138) permits the use of publicly-owned park land, recreational area, wildlife and waterfowl refuge, or land of an historic site of National, State, or local significance for a transportation project only if (1) there is no prudent and feasible alternative to using that land and (2) the project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use. The purpose of Section 4(f) requirements is to preserve significant parkland recreation areas, refuges, and historic and archaeological sites by limiting the circumstances where such land can be used for transportation projects.

A discussion of Section 4(f) is provided in section 3.14 of this EA.

4.1.4 Uniform Relocation Assistance and Real Property Acquisition Act of 1970

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (42 U.S.C. 4601 et seq. and 49 CFR 24), as amended by the Uniform Relocation Act Amendments of 1987 is commonly referred to as the "Uniform Act." The Uniform Act provides important protection and assistance for people affected by Federally-funded projects. The law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving Federal funds, will be treated equitably and will receive assistance in moving from the property they occupy.

Minor permanent acquisition may occur for this project, as well as the need for temporary construction parcels. Information is provided in section 3.16. All acquisitions would conform to the Uniform Relocation Assistance and Real Property Acquisition Act of 1970.

4.1.5 Endangered Species Act of 1973

The ESA of 1973 (16 U.S.C. 1531-1544) establishes a process for identifying and listing threatened and endangered species. It requires Federal agencies to carry out programs for the conservation of Federally-listed endangered and threatened plants and wildlife and designated critical habitats for such species, and prohibits actions by Federal agencies that would likely jeopardize the continued existence of those species or result in the destruction or adverse modification of designated critical habitat. Section 7 of the ESA requires consultations with Federal wildlife management agencies, such as the USFWS and NMFS.

To begin consultations with agencies that have authority over protected species, FHWA-CFLHD sent a letter requesting a list of threatened and endangered species, candidate species, plants and animals of concern, and critical habitats in the vicinity of the proposed bridge project. USFWS responded by letter dated December 22, 2014, providing the location-specific biological information and recommended standard BMPs. Discussions continued through meetings held with the USACE on December 11, 2014 and with USFWS, EPA, NMFS, and DLNR Division of Aquatic Resources on March 13, 2015. Section 7 consultations are ongoing and will be completed prior to project approval.

4.1.6 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e) calls for conservation of wildlife resources related to projects where the "waters of any stream or other body of water" are impounded, diverted, or modified by any agency under a Federal permit or license. The law requires consultation with

USFWS and State fish and wildlife agencies for the purpose of "preventing loss of and damage to wildlife resources."

Consultation related to the FWCA is occurring as part of ongoing coordination with resource agencies.

4.1.7 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), as amended, establishes provisions relative to Essential Fish Habitat (EFH), to identify and protect important habitats for federally managed marine and anadromous fish species. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, and/or growth to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties used by fish and may include areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, and structures underlying the waters and associated biological communities. Federal agencies which fund, permit, or undertake activities that may adversely affect EFH (including actions outside EFH, such as upstream/upslope activities) are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond to NMFS recommendations. An adverse effect is defined as any impact that reduces quality and/or quantity of EFH, including direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, species and their habitat, and other ecosystem components.

A discussion on impacts to EFH is provided in section 3.8. FHWA-CFLHD has been coordinating with NMFS on the project and appropriate BMPs. FHWA-CFLHD will submit its findings of *may affect, but is not likely to adversely affect* EFH to NMFS, and consultation will be completed prior to project approval.

4.1.8 Clean Water Act of 1972

The Federal Water Pollution Control Act (FWPCA) (33 U.S.C. §§1251 et seq.), is the Federal statute regulating the discharge of water pollution. Congress revised the FWPCA into the CWA in 1972. The goals of the CWA include: *(1) "the discharge of pollution into the navigable waters be eliminated by 1985," (2) "the discharge of toxic pollutants in toxic amounts be prohibited," and (3) an "interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and... recreation in and on the water... by July 1, 1983*" (CWA §101a and 33 U.S.C. §1251a).

Section 404 of the CWA regulates discharge of dredge and fill material in the Waters of the U.S., including wetlands, and requires a Department of the Army permit from the USACE. Section 401 of the CWA directs States to establish water quality certification (WQC) programs; in Hawai'i, the Section 401 WQC is administered by the HDOH, Clean Water Branch. The project would result in a discharge to Waters of the U.S. regulated under Section 404. As such, the project will require a Section 404 Department of Army Permit and Section 401 WQC.

Section 402 of the CWA requires an NPDES permit for point source discharges, including storm water discharges associated with construction activities. The permit is required for construction activities that disturb 1 acre or more and discharge storm water from the project site to waters of the U.S. The project is expected to require an NPDES permit.

4.1.9 Clean Air Act of 1970

The CAA and amendments (42 U.S.C. §7401 et seq.) is the comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. EPA to establish National Ambient Air Quality Standards to protect public health and the environment. Pursuant to the CAA and amendments, State-operated permit programs serve to control emissions. In Hawai'i, the operating permit program is implemented by HDOH, and emissions of regulated air pollutants within the state may be subject to permitting as required under HAR 11-60.1.

The purpose of this project is to replace the Wainiha temporary bridges. This project has been determined to generate minimal air quality impacts for CAA criteria pollutants (discussed in section 3.2 of this document) and has not been linked with any special MSAT concerns. This project would not result in

changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the No Action alternative.

4.1.10 Rivers and Harbors Act of 1899

The River and Harbor Act of 1899 (33 U.S.C. 401 et. seq.) requires that the Secretary of the Army issue permits for various activities to protect navigable and tidally influenced waterways.

Section 9 of the Act requires authorization from USACE before construction of a bridge, dam, dike, or causeway over or in navigable waterways of the U.S. It requires that any agency planning to construct or modify a bridge apply for a Coast Guard bridge permit. The streams affected by this project are not considered navigable and no permit is required, as coordinated with the U.S. Coast Guard.

Section 10 of the Act requires authorization from USACE before construction of any structure over, excavation from, or disposal of materials into navigable waters. Structures or work outside the limits defined for navigable waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The reaches of the streams in this project are tidally influenced and may be considered navigable, such that Section 10 authorization is expected to be required.

4.1.11 Floodplain Management, Executive Orders 11988 and 12148

Executive Order 11988, Floodplain Management, dated May 24, 1977 requires Federal agencies to take action to reduce the risk of flood loss, restore the natural and beneficial values of floodplains, and minimize the impacts of floods on human safety, health, and welfare. Executive Order 12148, July 20, 1979, amended Executive Order 11988. The main feature of the amendment added that agencies with responsibilities for Federal real estate properties and facilities will, at a minimum, require the construction of Federal structures and facilities to be in accordance with the criteria of the National Flood Insurance Program.

The proposed project crosses the Wainiha Stream. As discussed in section 3.5, the project is located in a regulated floodplain. No rise in the base flood elevations is anticipated. FHWA-CFLHD will continue to coordinate the results of the hydraulic modeling with the local floodplain administrator, the County of Kaua‘i.

4.1.12 Protection of Wetlands, Executive Order 11990

Executive Order 11990, Protection of Wetlands, dated 1977 requires Federal agencies to avoid, preserve, or mitigate effects of new construction projects on lands that have been designated wetlands.

A discussion on wetlands and avoidance and minimization measures is provided in section 3.3, Water Resources. Minor impacts would occur, but the majority of impacts would be temporary.

4.1.13 Invasive Species, Executive Order 13112

Executive Order 13112 (64 Federal Register 6183), issued in 1999, requires Federal agencies to implement policies to minimize the spread of invasive species. Federal agencies cannot authorize, fund, or carry out action(s) that are likely to cause or promote the introduction or spread of invasive species, unless it has been determined (1) that the benefits of the action outweigh the potential harm caused by invasive species, and (2) that all feasible and prudent measures to minimize risk of harm will be taken.

Temporarily disturbed areas would be revegetated as part of the project, and the spread of noxious weeds would be managed through the implementation of BMPs as part of the project.

4.1.14 Coastal Zone Management Act (16 U.S.C. §1456 (C) (1))

In 1972, the U.S. Congress enacted the Federal Coastal Zone Management Act to ensure that each Federal agency undertaking an activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone will be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. Each Federal

agency carrying out an activity subject to the Act will provide a consistency determination to the relevant State agency designated under Section 1455(d)(6) of this title at the earliest practicable time.

The State administers the enforcement of this Act under the Hawai'i Coastal Zone Management (CZM) Program (HRS Chapter 205A), and therefore, the discussion of the project's consistency with CZM objectives is discussed in section 3.4.

4.1.15 Environmental Justice, Executive Order 12898

Executive Order 12898, Environmental Justice, was signed on February 11, 1994. The intent of Executive Order 12898 (full title: Federal Actions to Address Environmental Justice to Minority and Low Income Populations) is to avoid disproportionately high adverse human health or environmental effects of projects on minority and low-income populations. Executive Order 12898 also requires Federal agencies ensure that minority and low-income communities have adequate access to public information related to health and the environment.

The project is not expected to result in disproportionately high and adverse effects to minority or low-income populations, as discussed in section 3.12.

4.1.16 Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d and 49 CFR 21) establishes that no person shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefit of, or subjected to discrimination under any program or activity receiving Federal financial assistance.

The project complies with Title VI through coordination with, and outreach to, Native Hawaiian communities required under Section 106, HRS 343, and Act 50 on cultural practices.

4.2 State of Hawai'i

4.2.1 Hawai'i State Plan

The Hawai'i State Plan, HRS Chapter 226, is the umbrella document in the statewide planning system. It serves as a written guide for the long-range development of the State by describing a desired future for the residents of Hawai'i and providing a set of goals, objectives, and policies that are intended to shape the general direction of public and private development.

The proposed project supports and is consistent with the following State Plan objectives:

> *Facility Systems – Transportation*
>
> *(a)(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.*
>
> *(a)(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.*
>
> *(b)(2) Coordinate state, county, Federal, and private transportation activities and programs toward the achievement of statewide objectives.*
>
> *(b)(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties.*
>
> *(b)(6) Encourage transportation systems that serve to accommodate present and future development needs of communities.*
>
> *(b)(10) Encourage the design and the development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment.*
>
> *Facility systems – in general*

(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

(b)(1) Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

Discussion: As the facility owner, it is HDOT's mission to provide a safe, efficient, and accessible transportation system for the public. HDOT recognizes the need to provide for the replacement of the existing temporary Wainiha bridges to ensure continued access, consistent with the Hawai'i State Plan.

4.2.2 State Functional Plans

The State Plan directs appropriate State agencies to prepare functional plans for their respective program areas. There are twelve State Functional Plans that serve as the primary implementing vehicle for the goals, objectives, and policies of the State Plan.

State Transportation Functional Plan

The State Transportation Functional Plan identified the four most critical issues of transportation: congestion, economic development, funding, and education (HDOT, 1991). Objectives, policies and implementing actions were identified for each issue. The following objectives and policies apply to the project:

Objective I.A. Expansion of the transportation system.

Policy I.A.1. Increase transportation capacity and modernize transportation infrastructure in accordance with existing master plans and laws requiring accessibility for people with disabilities.

Policy I.A.2. Improve regional mobility in areas of the State experiencing rapid urban growth and road congestion.

Discussion: The mission of HDOT is to provide a safe, efficient, and accessible transportation system for the public. HDOT recognizes the need to provide for the replacement of the existing temporary Wainiha bridges to ensure continued function of the transportation facility.

4.2.3 State Land Use Law

The State Land Use Commission, pursuant to HRS Chapter 205 and 205A and HAR Chapter 15-15 is empowered to classify all lands in the State into one of four land use districts: Urban, Rural, Agricultural, and Conservation. The lands surrounding the project limits are classified in the Agricultural and Conservation District. The proposed improvements are allowable uses within these land use districts. No change in land use classification will be needed. A Conservation District Use Permit will be required.

4.2.4 Coastal Zone Management Program and Federal Consistency Determination

In 1977, Hawai'i enacted HRS Chapter 205A, Hawai'i Coastal Zone Management Program, to carry out the State's CZM policies and regulations under the Federal Coastal Zone Management Act. The CZM area encompasses the entire state, including all marine waters seaward, to the extent of the State's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters.

As a result, the project is within the CZM area and subject to consistency with the objectives and policies of the Hawai'i CZM Program. The CZM Federal Consistency Certification is reviewed by the State Office of Planning. The Hawai'i CZM program focuses on ten policy objectives. Other key areas of the CZM program include: a permit system to control development within a Special Management Area (SMA) managed by each County and the Office of Planning (see Section 4.3.4); a Shoreline Setback Area that serves as a buffer

against coastal hazards and erosion, and protects view-planes; and marine and coastal resources. Finally, a Federal Consistency provision requires that Federal activities, permits, and financial assistance be consistent with the Hawai'i CZM program. The project is consistent with the CZM program objectives as described in section 3.4.

4.2.5 Act 50, Cultural Practices

Hawai'i Act 50 (2000) sought to "promote and protect cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups" and requires the proposing agency/applicant under Chapter 343 HRS to consider cultural practices in a CIA. A CIA is being completed for the project in compliance with this requirement.

4.2.6 County of Kaua'i General Plan

The General Plan provides guidance for land use regulations, development, facilities, and planning for County and State facilities and services. Chapter 2 outlines a vision for Kaua'i, which includes a section on Rural Roads and Highways. Section 5.5 of the plan suggests maintaining the one-lane bridges and historic road dimensions in the Hanalei to Ha'ena Senic Roadway Corridor. The plan calls for striking a balance between safety needs and preserving historic and scenic character. In addition, section 5.5.2 emphasizes the use of flexible highway design. This project has been designed consistent with that discussed in the General Plan.

4.2.7 Zoning

County zoning provides the most detailed set of regulations affecting land development before actual construction. The project site is zoned as Open and Residential. The proposed project will not require any zoning change.

4.2.8 Special Management Area

The CZM objectives and policies (HRS § 205A-2) were developed to preserve, protect, and, where possible, restore the natural resources of Hawai'i's coastal zone. Any development within the SMA boundary requires a SMA Use permit that is administered by the County Kaua'i. The permitting process provides a heightened level of public scrutiny to ensure consistency with SMA objectives.

The proposed project is located within the SMA and is discussed in section 3.4.

4.3 Transportation Plans

4.3.1 Statewide Federal-aid Highways 2035 Transportation Plan

The 2035 Transportation Plan was developed as the State's first long-range multimodal transportation for Federal-aid highways (HDOT 2014). The plan is intended to guide transportation decisions by identifying goals and solutions within a context of limited resources. It addresses future land transportation needs for motorists, freight, transit, bicyclists, and pedestrians based on land use and socioeconomic projections through 2035.

The long-range plan was developed with participation from a wide spectrum of community members and stakeholders. A series of meetings were held to develop and refine the goal statements. Specifically relevant to this project are the goals provided in Table 4-1, which focus on prudent and timely investments in the transportation (highway) system to maintain functionality and longevity.

Goals	Objectives
3.1 Manage transportation assets and optimize investments	Plan and implement maintenance, resurfacing, rehabilitation, and reconstruction to optimize existing transportation system improvements and spending.
3.2 Maintain safe, efficient,	Plan and implement existing system

complete transportation system for the long term	improvements to effectively sustain the overall transportation system's safe, efficient, and complete operations.

The plan also suggests the replacement of the three Wainiha Bridges. This project is therefore consistent with this plan.

4.3.2 Kūhiō Highway (Route 560) Historic Roadway Corridor Plan

The Kūhiō Highway Historic Roadway Corridor Plan (HDOT 2005) was published by the Hawai'i State Department of Transportation in 2005. Wainiha Bridges 1, 2, and 3 are designated high priority action items. The document stresses the importance of rural-historic road design intended to protect the corridor's natural and historic conditions and characteristics. The objective of the plan is to maintain the intrinsic historic and cultural values of the existing facility while addressing issues of transportation safety and efficiency. The Kūhiō Highway Historic Roadway Corridor Plan also describes general policies for Route 560 as a rural-historic road, specific design guidelines for the construction of transportation facilities along the route, implementation expectations, and a legal framework and strategy for implementation. Specific design recommendations for one-lane bridges along the route were also included. This project is consistent with the 2005 plan.

SECTION 5

Findings and Reasons Supporting the Anticipated Determination

This EA found that the potential impacts associated with the proposed project will not be significant, or will be mitigated to less than significant levels. Potential environmental impacts are generally temporary, occurring during construction, and would not be expected to adversely impact the long-term environmental quality of the project area. This section summarizes the significance criteria used to determine whether the proposed project would have a significant effect on the environment

5.1 Significance Criteria

The potential effects of the proposed project were evaluated based on the Significance Criteria specified in HAR Section 11-200-12 (revised in 1996). Discussion of the project's conformance to the HAR criteria is presented as follows. Significance discussions related to NEPA is included in the impact discussion for individual resources in Chapter 3 of this EA.

Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources. The proposed project would not cause significant adverse impacts to biological resources, cultural resources, soils and geology, or water resources, and therefore does not involve irrevocable commitment to, loss or destruction of any natural or cultural resources. Implementation of water resources and biological resources avoidance, minimization, and mitigation measures and the minimal construction footprint would ensure that there are no significant effects or loss or destruction natural resources.

Curtails the range of beneficial uses of the environment. The proposed project would replace existing temporary structures generally in-kind and would have no impact on the beneficial uses of the environment within the project area.

Conflicts with the State's long-term environmental policies or goals and guidelines, as expressed in HRS Chapter 344, and any revisions thereof and amendments thereto, court decisions, or executive orders. The proposed project is consistent with the environmental policies, goals, and guidelines defined in HRS Chapter 344. In particular, the project is consistent with transportation guidelines by improving the region's transportation infrastructure. As discussed in Section 3, the potential impacts related to the proposed project are associated with short-term construction-related activities that can be minimized through implementation of mitigation measures described in this EA.

Substantially affects the economic or social welfare of the community or state. The proposed project would not result in significant socio-economic impacts on the community or state, as it would not cause an increase in population or change the demographic characteristics of the local area. The proposed project would create short-term employment opportunities consisting primarily of construction-related jobs generated by the proposed project. The proposed project would also have a positive impact on the economic and social welfare of the community by improving the long-term functionality of the highway system.

Substantially affects public health. With the exception of short-term, construction-related impacts to ambient air and noise levels, no long-term significant impacts to the public's health and welfare are anticipated. The incorporation of recommended mitigation measures and BMPs during the construction period would minimize these temporary impacts to surrounding communities.

Involves substantial secondary impacts, such as population changes or effects on public facilities. No adverse secondary impacts on the environment, such as population growth or the need to expand public facilities, would be anticipated with the implementation of the proposed project.

Involves a substantial degradation of environmental quality. The proposed project would not cause any impacts that would substantially degrade environmental quality. Construction activities associated with the proposed project are anticipated to result in relatively insignificant short-term impacts to noise, air quality, vegetation and traffic in the immediate project vicinity. The incorporation of mitigation measures during the construction period would prevent adverse impacts to the environmental quality.

Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions. The proposed project is a self-contained action and is not part of additional and/or related actions. No other past, present, or future actions associated with these land uses have been identified that would contribute to significant cumulative impacts for any of the resources considered in this EA.

Substantially affects rare, threatened, or endangered species or its habitat. Biological surveys in September 2014 identified suitable nesting and foraging habitat for threatened and endangered species within the project area and adjacent areas. These include Hawaiian waterbirds, Hawaiian hoary bat, nēnē, and two-listed marine species, the Hawaiian monk seal and green sea turtle. Seabirds may also fly over the area. Measures including timing of vegetation removal, preconstruction nest surveys, fencing, lighting restrictions, and stop-work provisions would be implemented so that no substantial effects would occur. Most habitat impacts would be temporary, and would be restored once construction is completed.

Detrimentally affects air or water quality or ambient noise levels. Only minimal construction-related, short-term impacts on air quality and noise levels are anticipated. Mitigation measures will be implemented to minimize construction-related noise and dust impacts. Adverse impacts to water resources would be prevented through BMPs and adherence to permit requirements. No long-term, direct or indirect, adverse impacts to these resources are anticipated from implementation of the proposed project.

Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a floodplain, tsunami zone, beach, erosion prone area, geologically hazardous land, estuary, freshwater, or coastal waters. This project is located within an environmentally sensitive area but is being designed in accordance with standards appropriate to the geologic, hydrologic, and seismic setting. It would have improved resiliency than the existing structures. No adverse impacts to the floodplain would occur.

Substantially affects scenic vistas and view planes identified in county or state plans or studies. The overall visual quality of the project area would improve as a result of bridge replacement. The proposed project would not obstruct any view planes or scenic vistas.

Requires substantial energy consumption. Construction of the proposed project would not require substantial energy consumption. Fuel will be consumed by construction vehicles and equipment, but this use will be comparable to other construction projects.

5.2 Conclusion

Through bridge design, impact avoidance and minimization actions, and proposed BMPs and mitigation measures, the analysis contained in this EA has determined that project-related impacts would be mitigated to less than significant levels, such that the proposed project would not result in significant adverse impacts.

SECTION 6

Anticipated Determination

Based on the information presented and examined in this document, the proposed project is not expected to produce significant adverse social, economic, cultural, or environmental impacts. Consequently, a finding of no significant impact is anticipated, pursuant to HRS Chapter 343 and the provisions of HAR Subchapter 6 of Chapter 200, Title 11.

SECTION 7

Consultation and Coordination

7.1 Organizations Consulted During Preparation of the Draft Environmental Assessment

The following agencies and organizations were contacted during preparation of the Draft EA. They received preliminary project information and asked to provide comments relative to specific environmental compliance (such as NHPA Section 106 and ESA Section 7) or for general assistance in preparing the Draft EA.

Consultation with Native Hawaiian Organizations regarding historic preservation is required as part of compliance with NHPA Section 106 and HRS Chapter 6E. Consultation is also occurring with the DLNR, State Historic Preservation Division.

7.1.1 Federal

- USACE
- USFWS
- USEPA
- NMFS
- USDA, NRCS

7.1.2 State of Hawai‘i

- HDOH, Clean Water Branch
- DLNR
- Office of Hawaiian Affairs
- SHPO
- Kaua‘i County Department of Parks and Recreation
- Kaua‘i County Fire Department
- Kaua‘i County Department of Water
- Kaua‘i County Planning Department

7.1.3 Utilities

- KIUC
- Hawaiian Telcom
- Oceanic Time Warner Cable
- Kaua‘i County Department of Water

7.1.4 Organizations

- Historic Hawai‘i Foundation
- Hanalei Roads Committee

7.2 Public Involvement

Three public meetings were held on the project. These meetings occurred on December 9, 2014, March 9, 2015, and September 15, 2015. All three meetings were held at the Hanalei Elementary School located at 5-5415 Kūhiō Highway in Hanalei. The meetings were publicized through public newspaper notices published prior to each meeting. HDOT also sent out press releases announcing the public meetings. Flyers were also sent to landowners and past meeting attendees, and the Hanalei Roads Committee further assisted in public meeting notice through additional mailing to the local community. Each meeting is summarized below and meeting minutes for each meeting is provided in Appendix B.

The goal of the public meeting that was held on December 9, 2014 was to re-engage the community following FHWA-CFLHD's entrance into the environmental and design process of the project, obtain community feedback on important considerations of the project, and validate the findings and past input provided by the community during the development of the Engineering Design Report for the project. This input provided the information for FHWA-CFLHD and HDOT to formulate the project's purpose and need and preliminary alternatives.

The goal of the public meeting held on March 9, 2015 was to present the project purpose and need and obtain input, and to present preliminary alternatives and design considerations and obtain input.

The goal of the public meeting held on September 15, 2015 was to present the alternatives proposed for analysis in this EA and obtain input.

The general topics of concern and comments provided by the public through the series of public meetings are summarized below:

Historic and community character

- Historic character of the road and the community should be maintained.
- Narrow one-lane bridges is what was there historically and are part of the pace, lifestyle and culture of the area. They are part of what makes the area so special and unique.
- Visual and aesthetics of the new bridges are extremely important. The ACROW bridges are not aesthetically pleasing.
- There is interest in re-creating the historic feel and sound of the previous timber bridges.

Operations

- The ACROW bridges don't function as well as the older bridges. It is more difficult to see across the bridges with the ACROW bridges. The rails are too high, with tighter spacing, the roadway and bridges are higher, and vegetation becomes overgrown and is not well-maintained.
- It is not uncommon for two vehicles to enter the bridge from opposite sides at the same time and one have to back up. Road rage sometimes occurs.
- Ensuring safe ingress and egress is important. Emergency vehicle access is necessary, with consideration of width, load capacity, and ability to withstand storms. Safe access in an emergency is important.
- Speeds are a concern. Narrow bridges help to keep speeds low. Wider bridges make people go faster and it becomes more unsafe.
- Many tourists don't seem to know how to navigate the one-lane bridges.

Maintenance Considerations

- Vehicles repeatedly hit the timber rails on the older bridges. This required repairs and replacements.
- The ACROW bridges require bolt tightening and corrosion protection.
- Vegetation often becomes overgrown and is not well-maintained. This affects visibility.

Construction and Other Impacts

- Impacts to the stream and estuary need to be adequately addressed and minimized.
- Traffic impacts during construction are a concern.
- The project is located in a floodplain. Flooding risk should not be worsened.

7.3 Agencies, Organizations, and Individuals to Be Contacted During the Draft EA Review Period

The following agencies, organizations, and individuals will be included on the distribution list for notification of the Draft EA public review and comment period.

7.3.1 Federal

- USACE
- USFWS
- USEPA
- NMFS

7.3.2 State of Hawai‘i

- Department of Accounting and General Services
- Department of Hawaiian Home Lands
- HDOH Clean Water Branch
- HDOH, Environmental Planning Office
- DLNR
- Hawai‘i Emergency Management Agency
- Office of Hawaiian Affairs
- Office of Planning
- SHPO
- Senator Ronald Kouchi, Senate District 8
- Representative Derek Kawakami, House District 14

7.3.3 County of Kaua‘i

- Civil Defense Agency
- Department of Public Works
- Department of Water
- Fire Department
- Mayor’s Office
- Parks and Recreation
- Planning Department
- Police Department
- Transportation Agency
- Kaua‘i Council Chair Mel Rapozo
- Kaua‘i Council Vice Chair Ross Kagawa
- Kaua‘i Councilmember Mason Chock
- Kaua‘i Councilmember Gary Hooser
- Kaua‘i Councilmember Arryl Kaneshiro
- Kaua‘i Councilmember KipuKai Kuali’i
- Kaua‘i Councilmember JoAnn Yukimura

7.3.4 Utilities

- Hawaiian Telcom
- KIUC
- Oceanic Time Warner Cable

7.3.5 Organizations and Individuals

- Hanalei Roads Committee

- Kauaʻi Chamber of Commerce
- Kauaʻi North Shore Business Council
- Kauaʻi Visitors Bureau
- Sierra Club, Kauaʻi Group of Kauaʻi Chapter
- Various Property Owners adjacent to Bridges
- Prior Meeting Attendees

7.3.6 Media

- *The Garden Island*

7.3.7 Public Library

- Hawaiʻi State Library (hard copy will be available for public review)
- Princeville Public Library (hard copy will be available for public review)

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