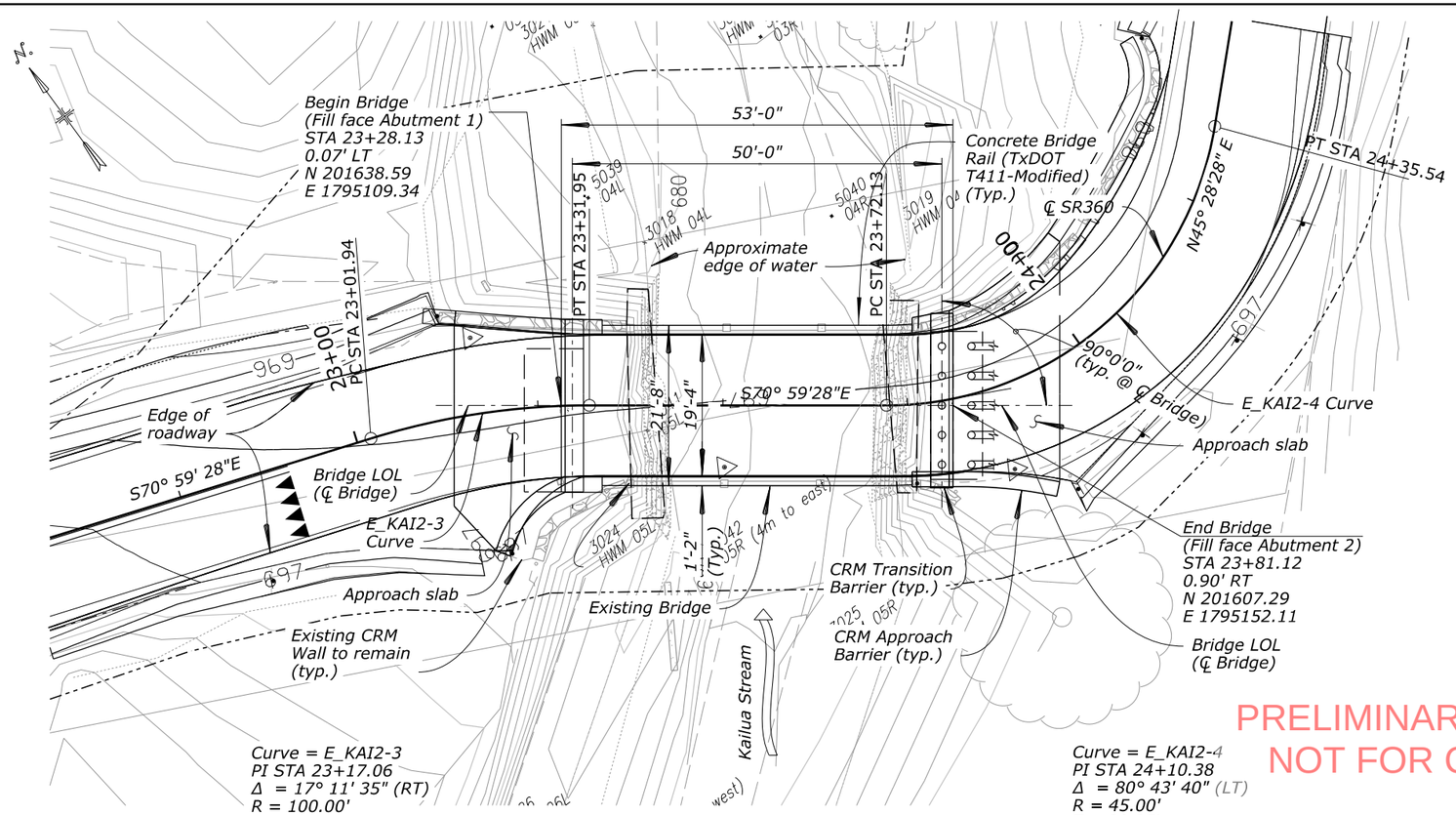
Appendix A.

Preliminary Design Plans

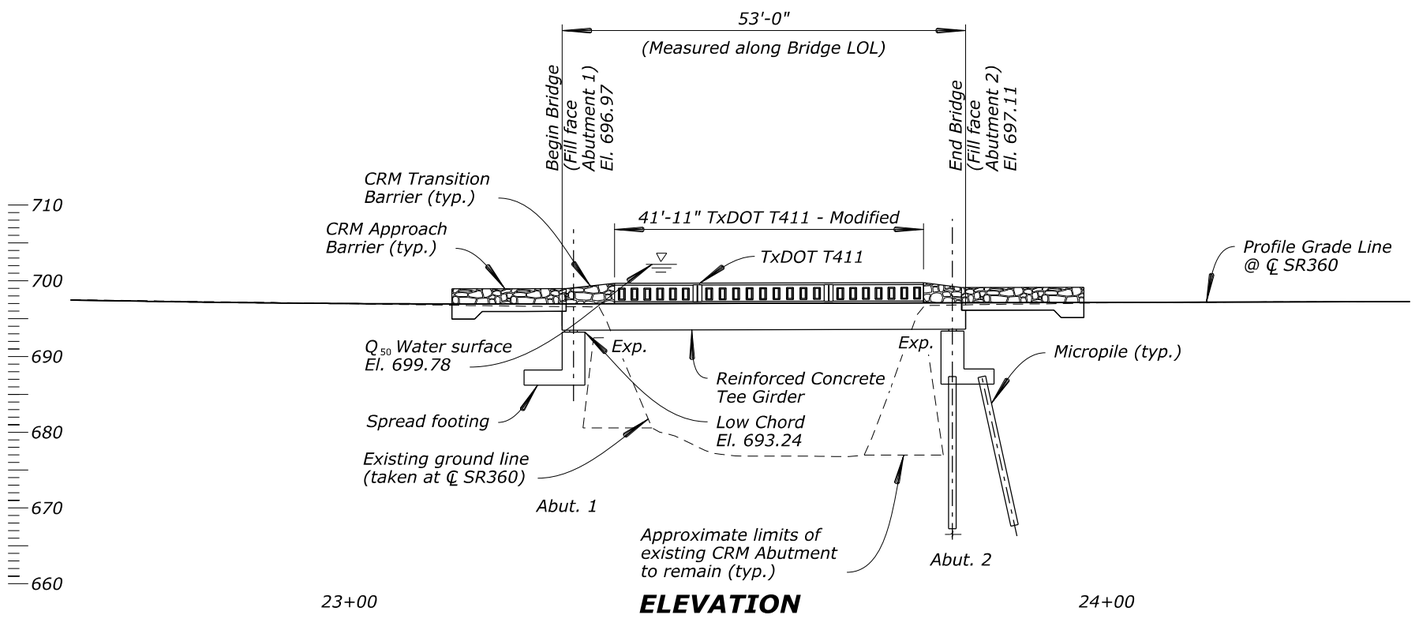
STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	2-S1

INDEX OF DRAWINGS



PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

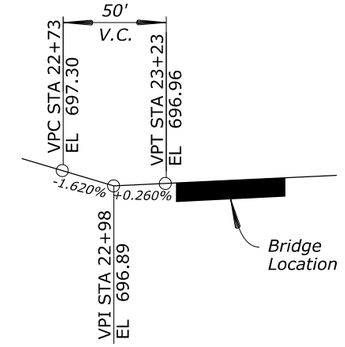
PLAN



ELEVATION

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	4970	12.78	690.53
Q_{50}	11909	20.9	699.78
Q_{100}	13136	21.9	701.2
Q_{500}	14189	24.3	704.2



PROFILE GRADE DIAGRAM

NO SCALE

ELEVATIONS ARE PROFILE GRADE ℄ SR360

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

KAILUA STREAM BRIDGE (BRIDGE #2)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	1" = 20'-0"	T. HEFFRON	1 of 24	JANUARY 2022	RG3214-A

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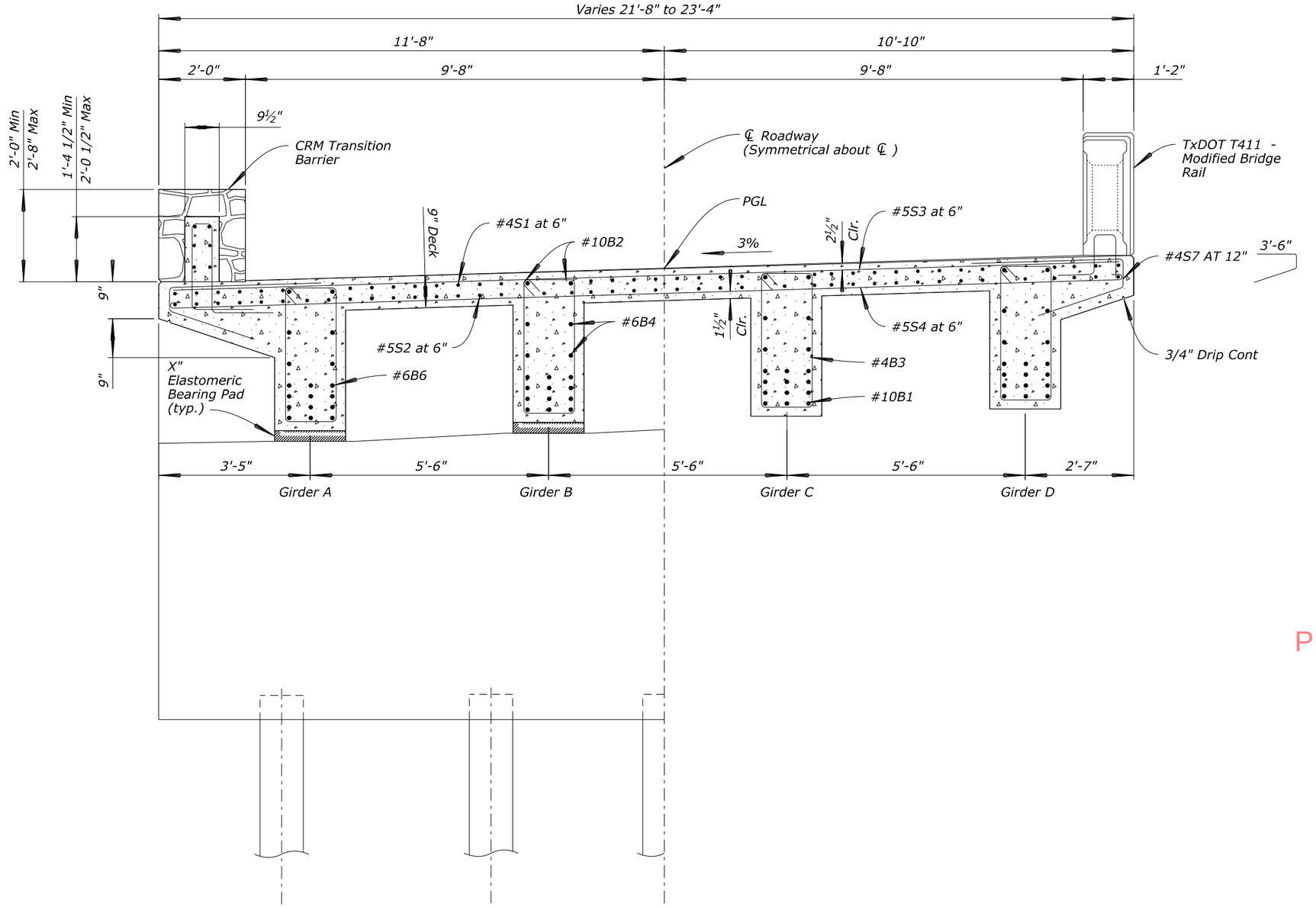
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	2-S12



TYPICAL SECTION AT ABUTMENT
(End Diaphragm Reinforcement Not Shown)

TYPICAL SECTION AT MIDSPAN

TYPICAL SECTION
(Looking Ahead Station, Normal to LOL)

PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

KAILUA STREAM BRIDGE (BRIDGE #2)

MAUI COUNTY, HAWAII

TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	3/8" = 1'-0"	T. HEFFRON	12 of 24	JANUARY 2022	RG3214-L

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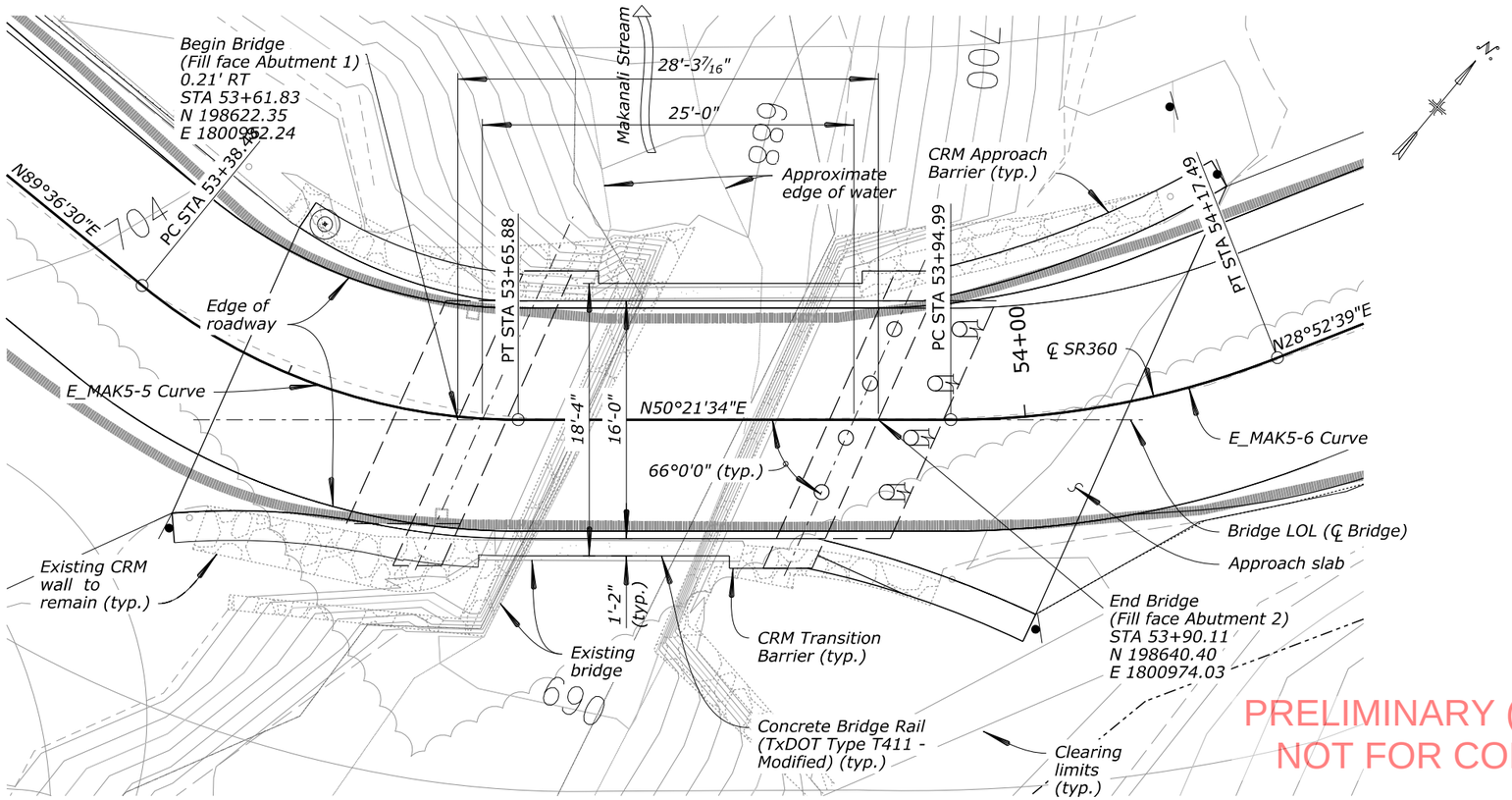
2/16/2022

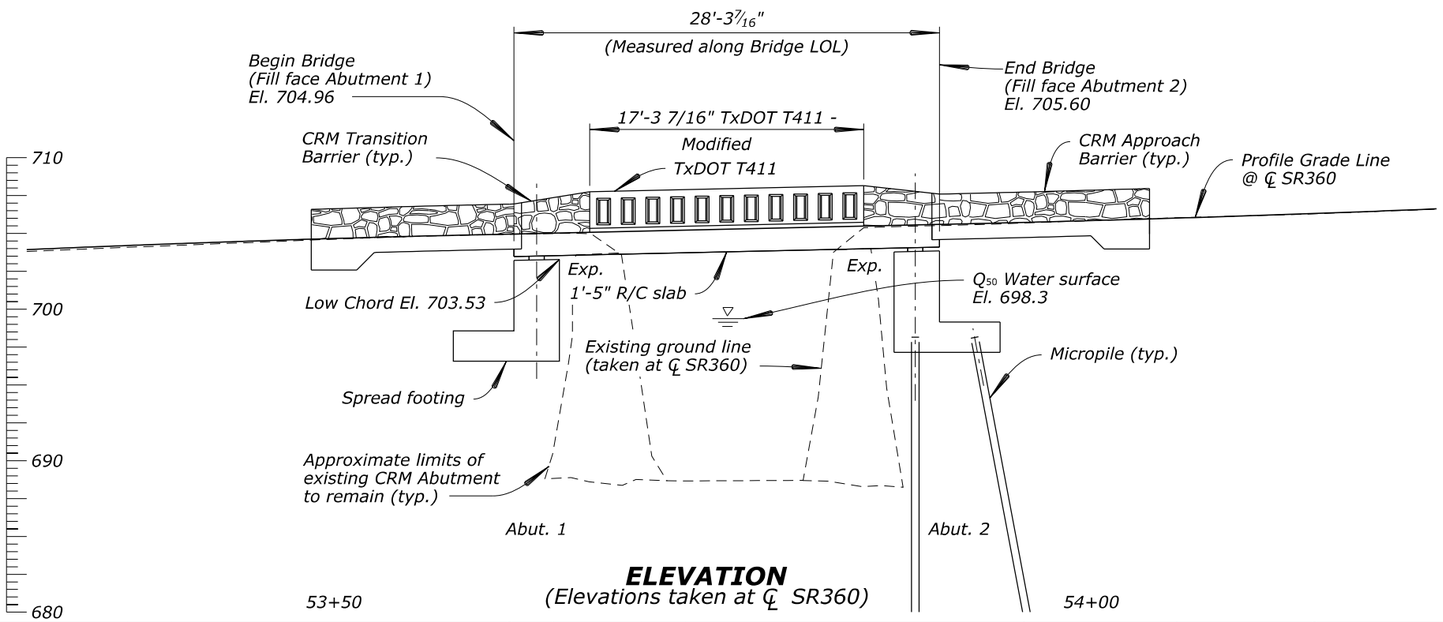
STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	5-S1

INDEX OF DRAWINGS



PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

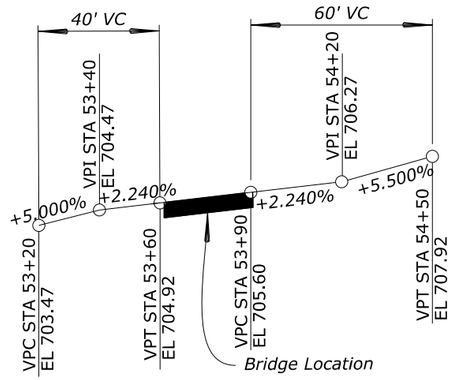
PLAN



ELEVATION
(Elevations taken at ℄ SR360)

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	151	7.6	693
Q_{50}	697	13.4	698.3
Q_{100}	850	14.4	699.5
Q_{500}	1250	16.2	701.6



PROFILE GRADE DIAGRAM
NO SCALE
ELEVATIONS ARE PROFILE GRADE ℄ SR360

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

MAKANALI STREAM BRIDGE (BRIDGE #5)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	1" = 10'-0"	T. HEFFRON	1 of 20	JANUARY 2022	RG3215-A

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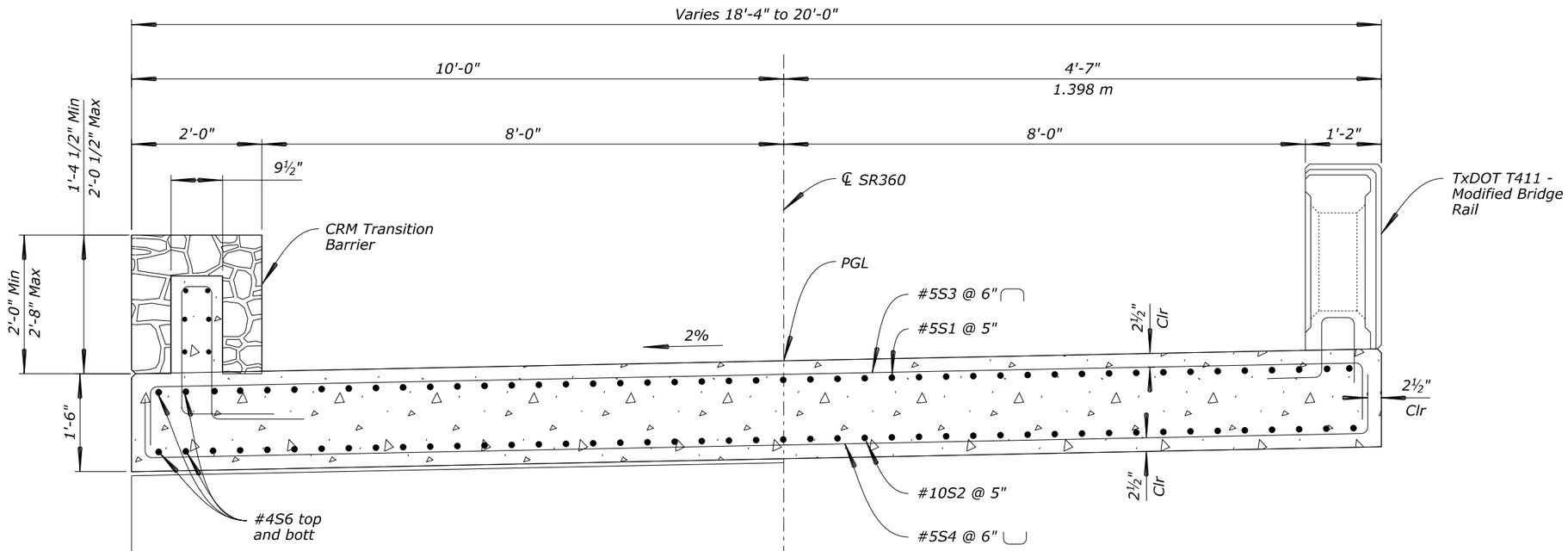
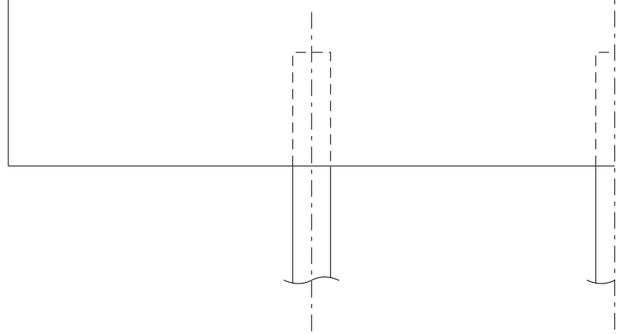
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	5-S10





TYPICAL SECTION AT ABUTMENT

TYPICAL SECTION AT MIDSPAN

TYPICAL SECTION

(Looking Ahead Station, Normal to LOL)

PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

MAKANALI STREAM BRIDGE (BRIDGE #5)

MAUI COUNTY, HAWAII

TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	1/2" = 1'-0"	T. HEFFRON	10 of 20	JANUARY 2022	RG3215-J

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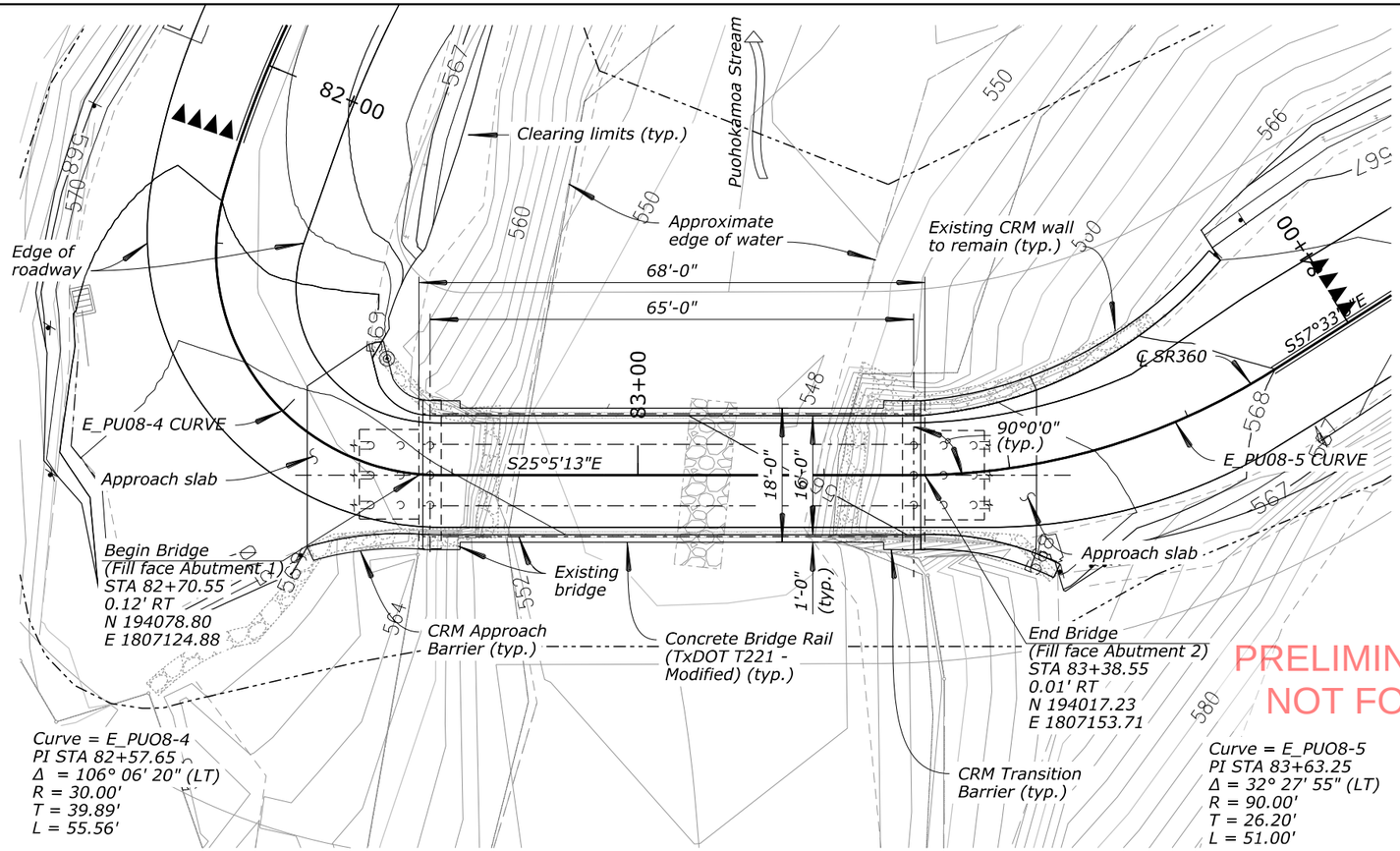
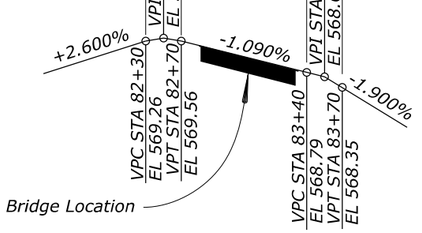
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	8-S1



PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

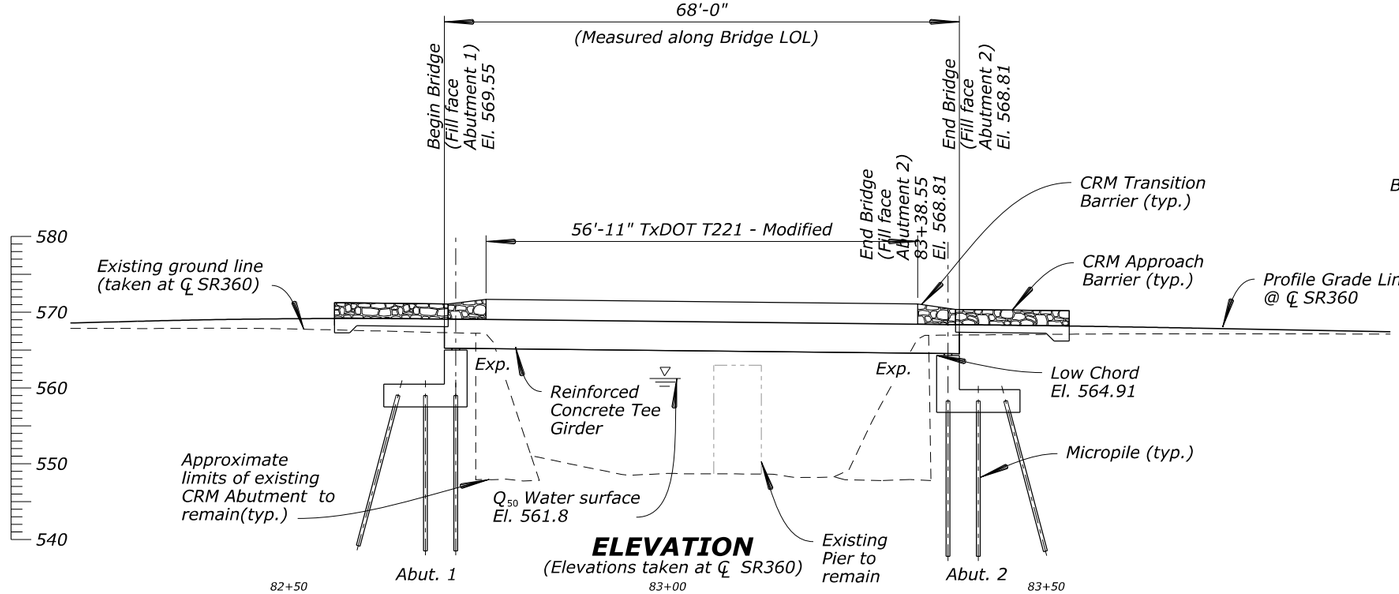
PLAN



PROFILE GRADE DIAGRAM

NO SCALE

ELEVATIONS ARE PROFILE GRADE ℄ SR360



ELEVATION

(Elevations taken at ℄ SR360)

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	1797	12.5	557
Q_{50}	4762	15.5	561.8
Q_{100}	5483	16.3	562.8
Q_{500}	7300	17.5	564.7

INDEX OF DRAWINGS

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

PUOHOKAMOA STREAM BRIDGE (BRIDGE #8)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	1" = 20'-0"	T. HEFFRON	1 of 25	JANUARY 2022	RG3216-A

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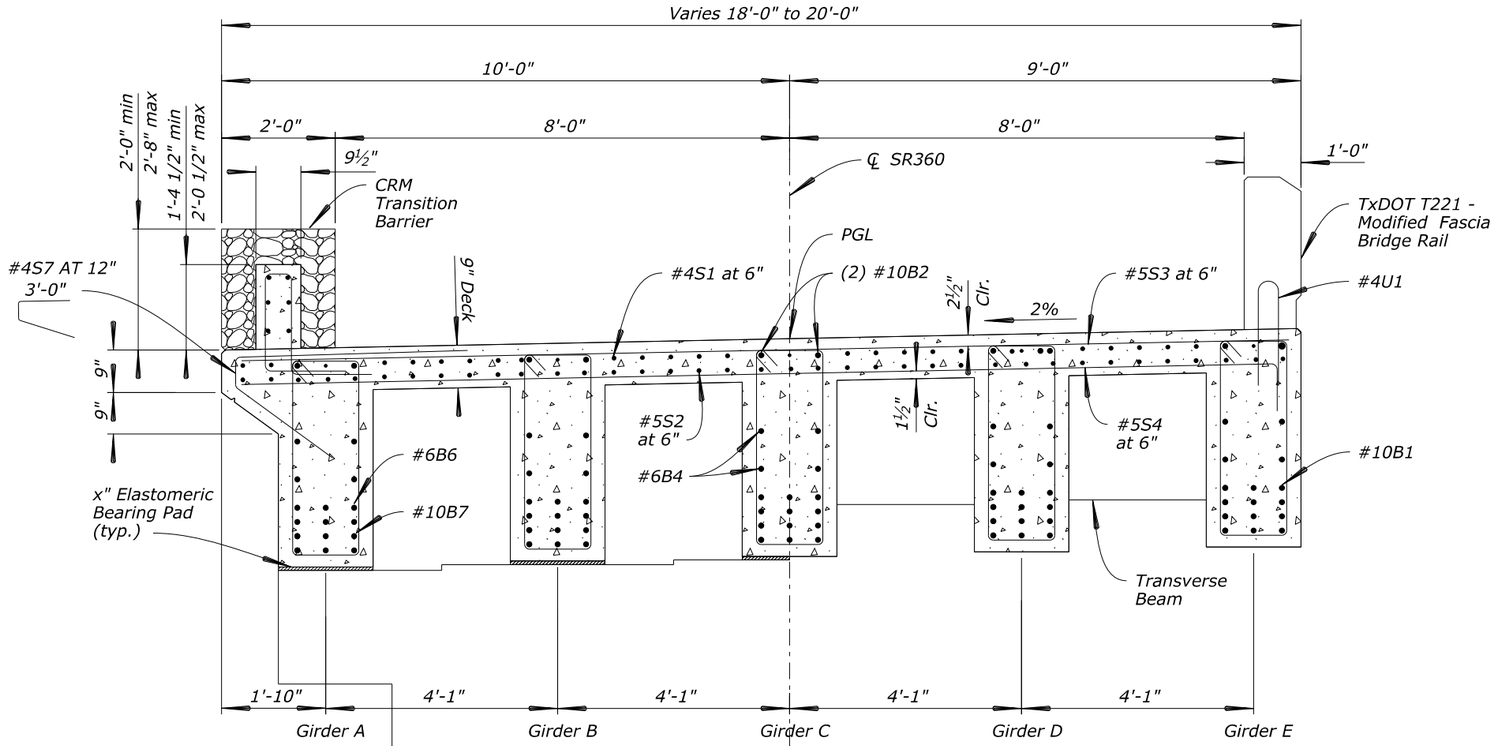
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	8-S13



TYPICAL SECTION AT ABUTMENT
(End Diaphragm Reinforcement Not Shown)

TYPICAL SECTION AT MIDSPAN
(Intermediate Transverse Diaphragm Reinforcement Not Shown)

TYPICAL SECTION
(Looking Ahead Station, Normal to LOL)

PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

PUOHOKAMOA STREAM BRIDGE (BRIDGE #8)

MAUI COUNTY, HAWAII

TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								B. CEZAR	K. SHIMOKAWA	D. FUJIOKA	3/8" = 1'-0"	T. HEFFRON	13 of 25	JANUARY 2022	RG3216-M

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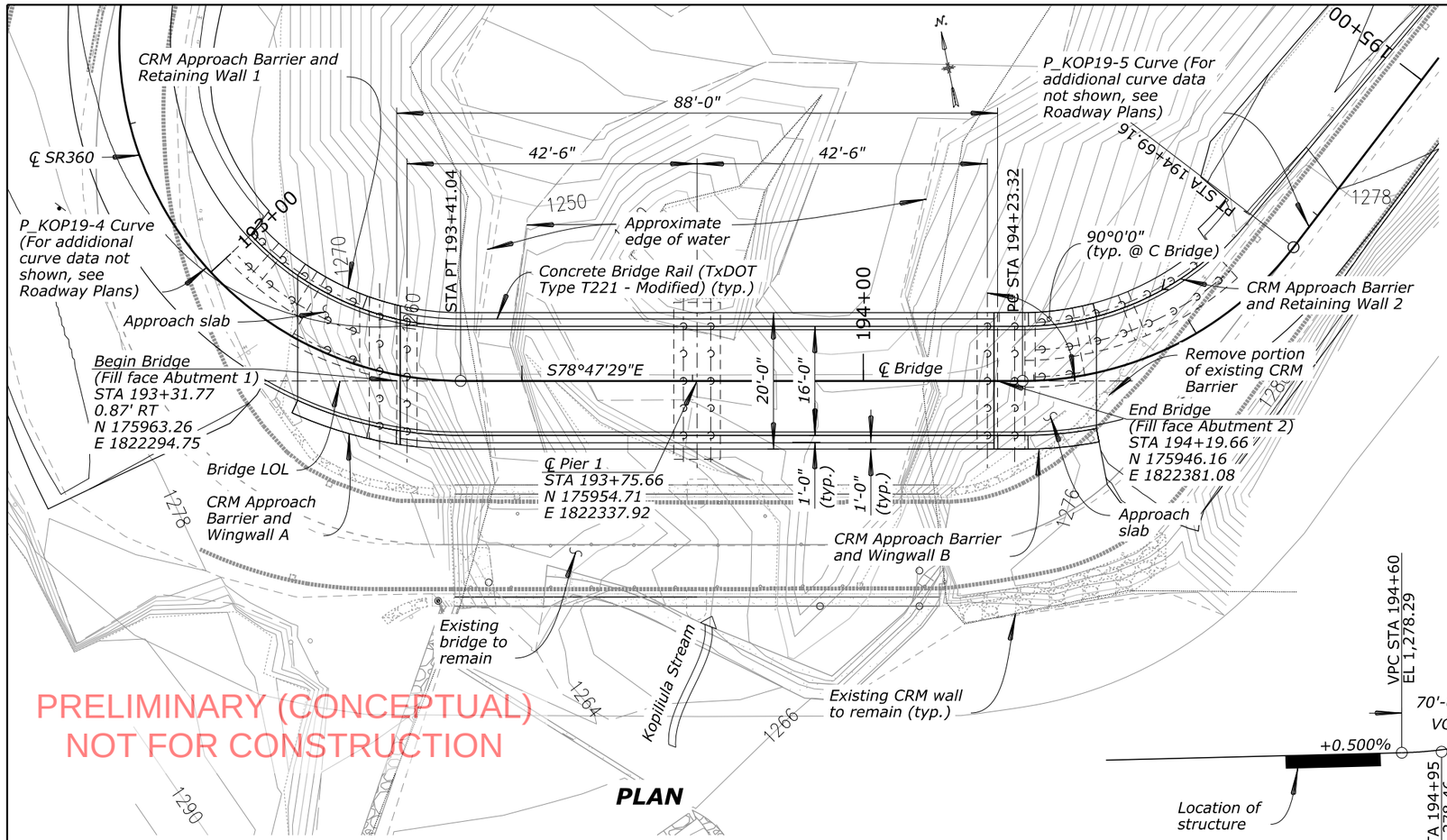
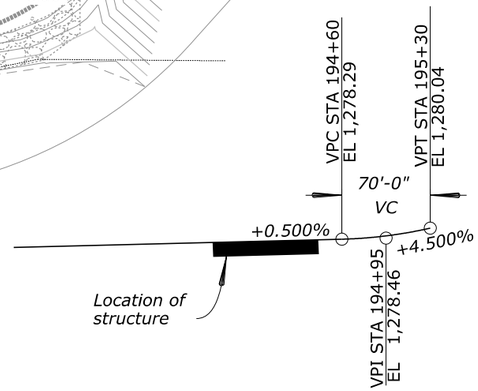
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	19-S1

INDEX OF DRAWINGS



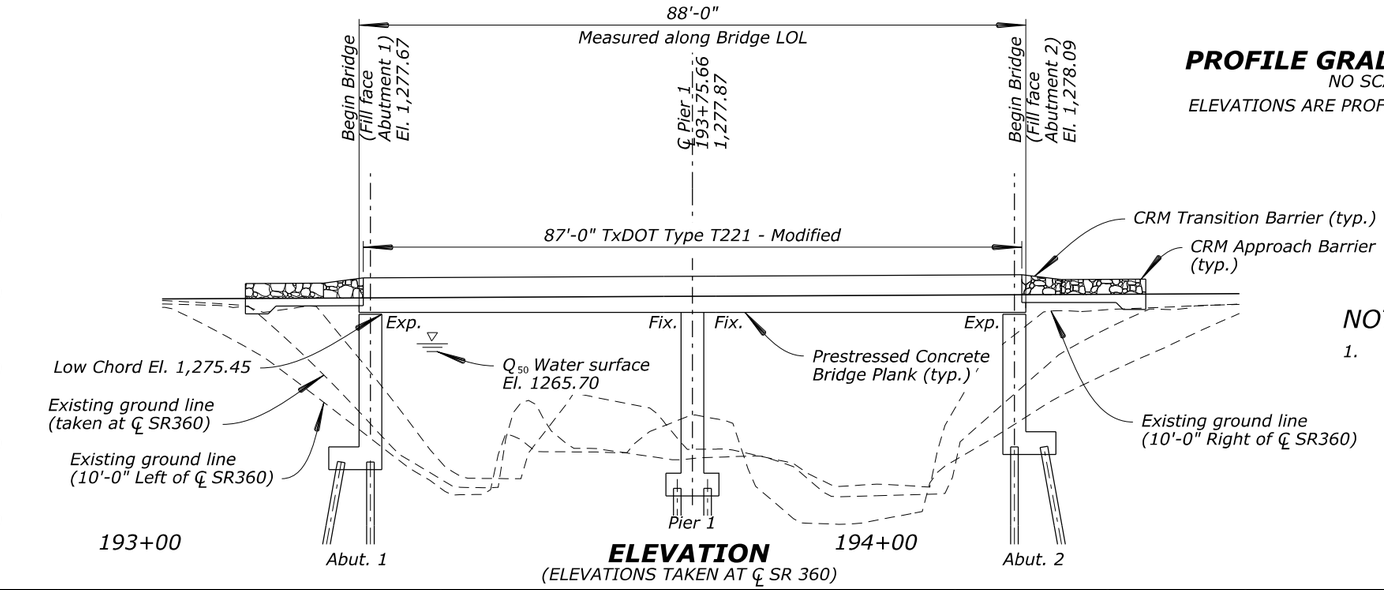
PLAN



PROFILE GRADE DIAGRAM

NO SCALE

ELEVATIONS ARE PROFILE GRADE ℄ SR360



ELEVATION

(ELEVATIONS TAKEN AT ℄ SR 360)

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	2427	22.5	126.4
Q_{50}	6830	27.2	1265.7
Q_{100}	7946	28	1266.6
Q_{500}	10860	29.2	1268.4

NOTE:

1. Scour countermeasures being developed and not shown in this 70% plan set.

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

KOPILIULA STREAM BRIDGE (BRIDGE #19)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								S. OROHO	B. TERRELL	T. POWERS	1" = 20'-0"	T. HEFFRON	1 of 31	JANUARY 2022	RG3217-A

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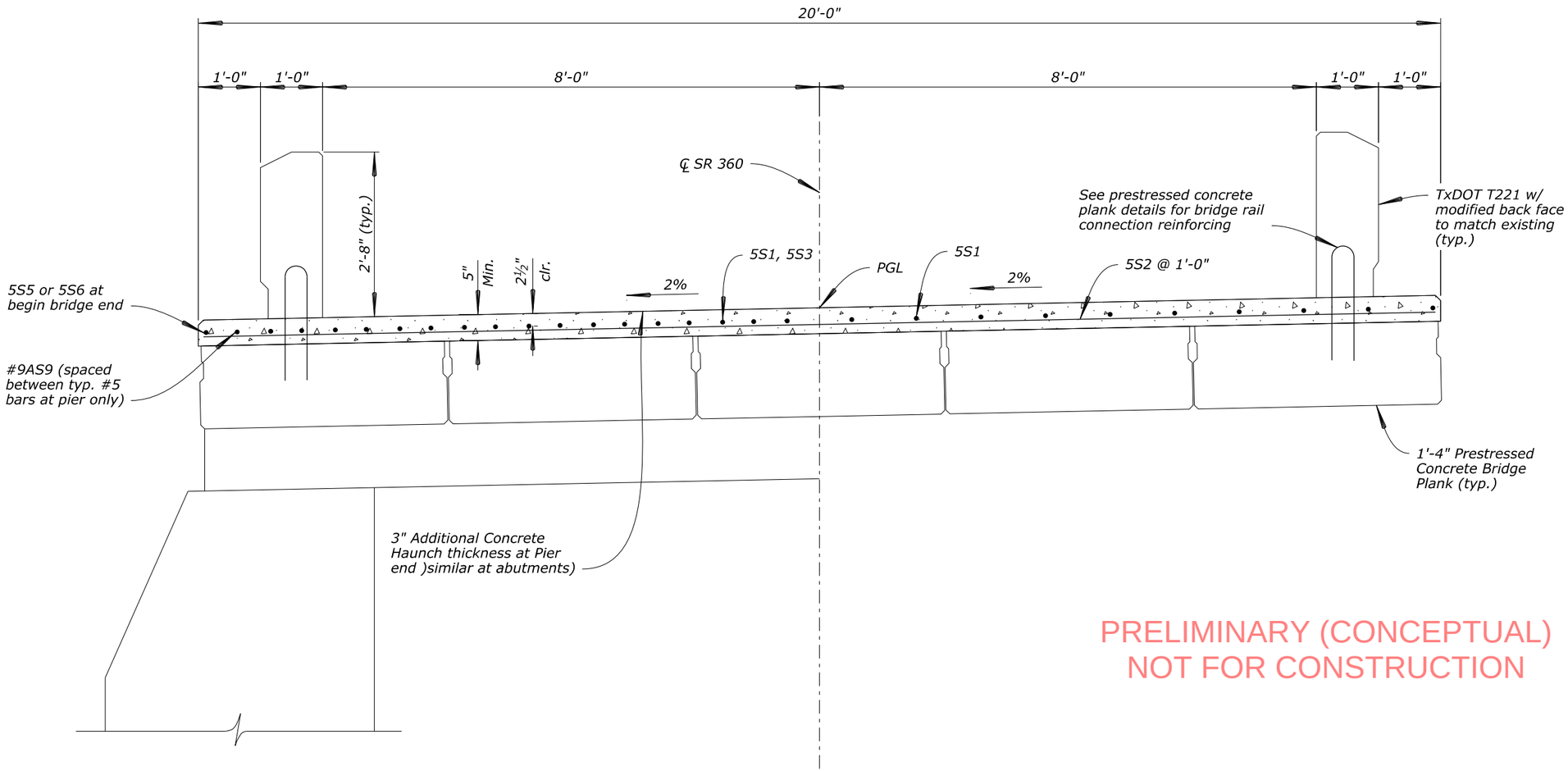
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	19-S16



PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

TYPICAL SECTION AT PIER

TYPICAL SECTION AT MIDSPAN

TYPICAL SECTION
(Looking Ahead Station, Normal to LOL)

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

KOPILIULA STREAM BRIDGE (BRIDGE #19)

MAUI COUNTY, HAWAII

TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								S. OROHO	B. TERRELL	T. POWERS	1/2" = 1'-0"	T. HEFFRON	16 of 31	JANUARY 2022	RG3217-P

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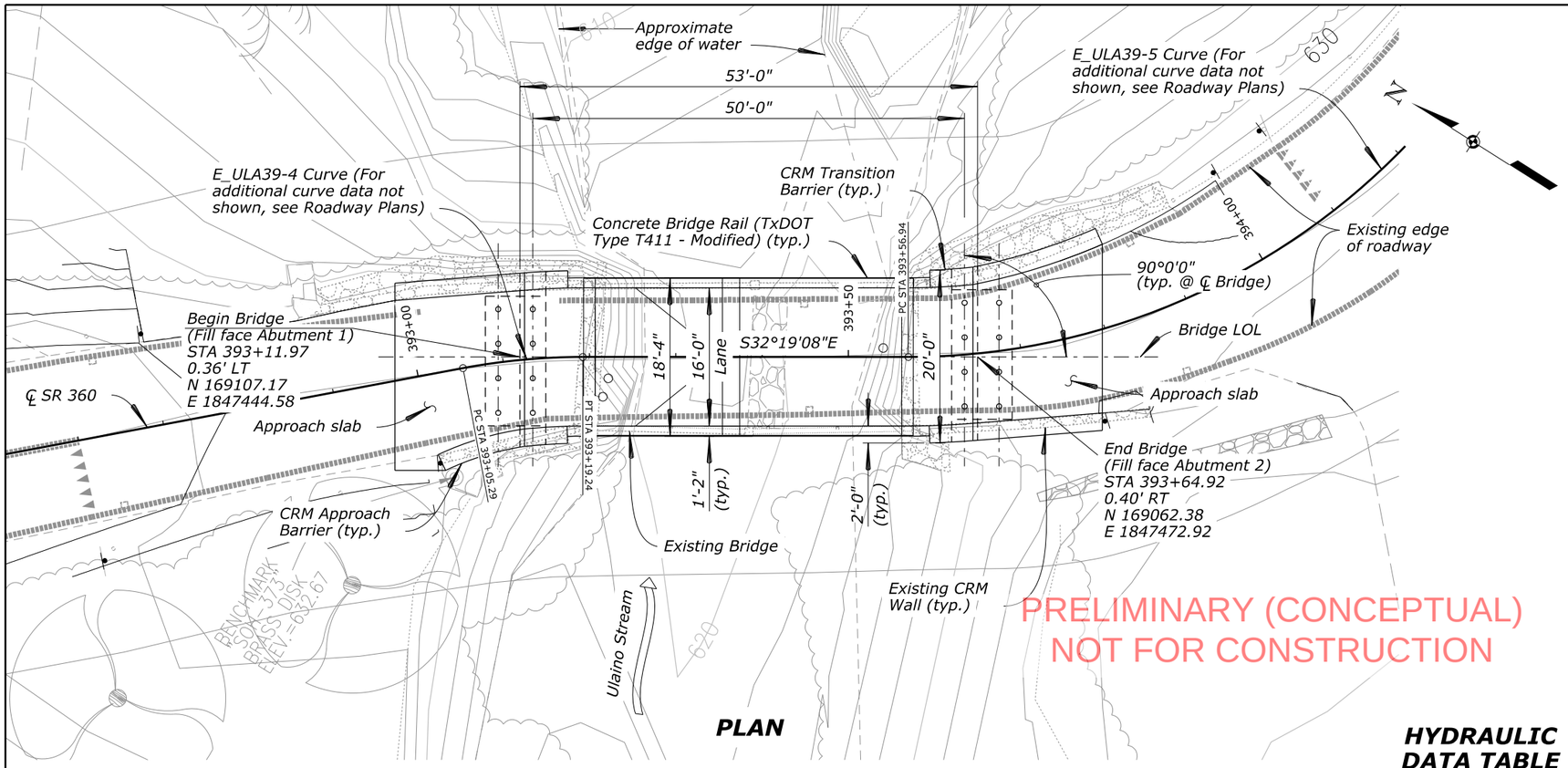
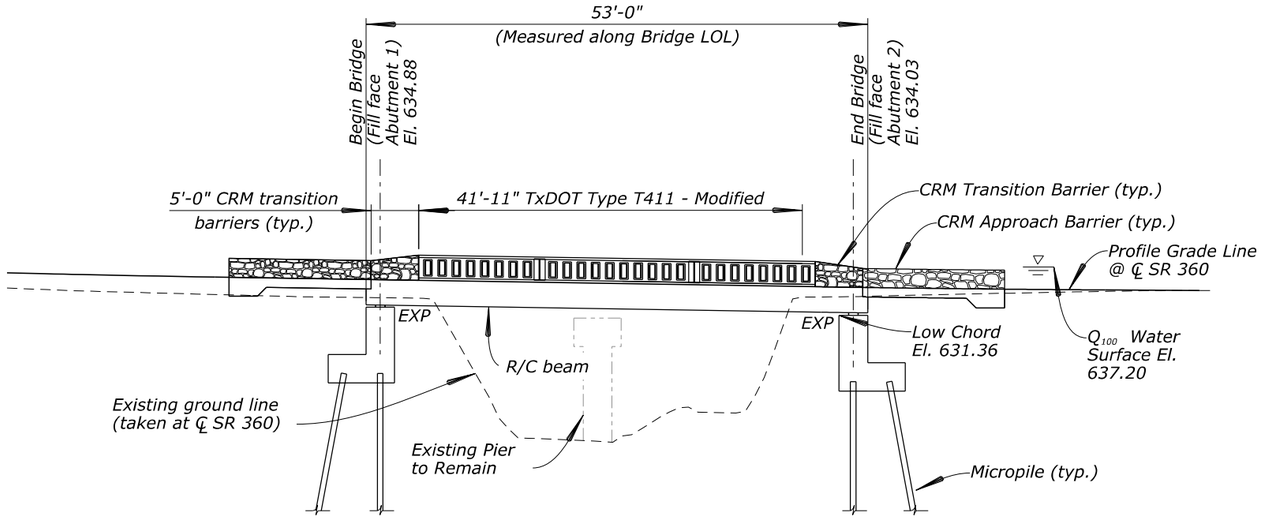
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	39-S1



PLAN

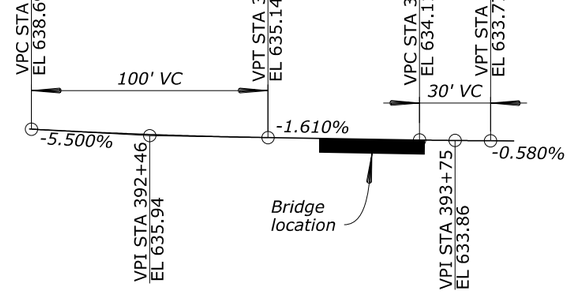
INDEX OF DRAWINGS	
DRAWING NO.	DESCRIPTION
RG3218-A	GENERAL PLAN AND ELEVATION
RG3218-B	GENERAL NOTES
RG3218-C	FOUNDATION LAYOUT
RG3218-D	ENGINEERING GEOLOGY
RG3218-E	REMOVAL OF EXISTING STRUCTURE
RG3218-F	ABUTMENT 1
RG3218-G	ABUTMENT 2
RG3218-H	EXISTING PIER STABILIZATION DETAILS
RG3218-I	GIRDER FRAMING PLAN
RG3218-J	GIRDER ELEVATION AND DETAILS
RG3218-K	END DIAPHRAGMS
RG3218-L	DECK PLAN
RG3218-M	TYPICAL SECTION
RG3218-N	TxDOT TYPE T411 BRIDGE RAILING DETAILS (1 OF 2)
RG3218-O	TxDOT TYPE T411 BRIDGE RAILING DETAILS (2 OF 2)
RG3218-P	APPROACH CRM BARRIER
RG3218-Q	CRM TRANSITION BARRIER
RG3218-R	APPROACH SLAB DETAILS (1 OF 2)
RG3218-S	APPROACH SLAB DETAILS (2 OF 2)
RG3218-T	ANCHOR SLAB DETAILS
RG3218-U	AESTHETICS
RG3218-V	BAR LIST (1 OF 3)
RG3218-W	BAR LIST (2 OF 3)
RG3218-X	BAR LIST (3 OF 3)



ELEVATION
(Elevations taken at ℄ SR 360)

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	1485	17.5	627.40
Q_{50}	4941	22.00	634.60
Q_{100}	5796	24.30	637.20
Q_{500}	7947	26.10	639.60



PROFILE GRADE DIAGRAM
NO SCALE
ELEVATIONS ARE AT PROFILE GRADE ℄ SR 360

PRELIMINARY NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

ULAINO STREAM BRIDGE (BRIDGE #39)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								N. DAVIS	B. TERRELL	T. POWERS	1/16" = 1'-0"	T HEFFRON	1 of 24	JANUARY 2022	RG3218-A

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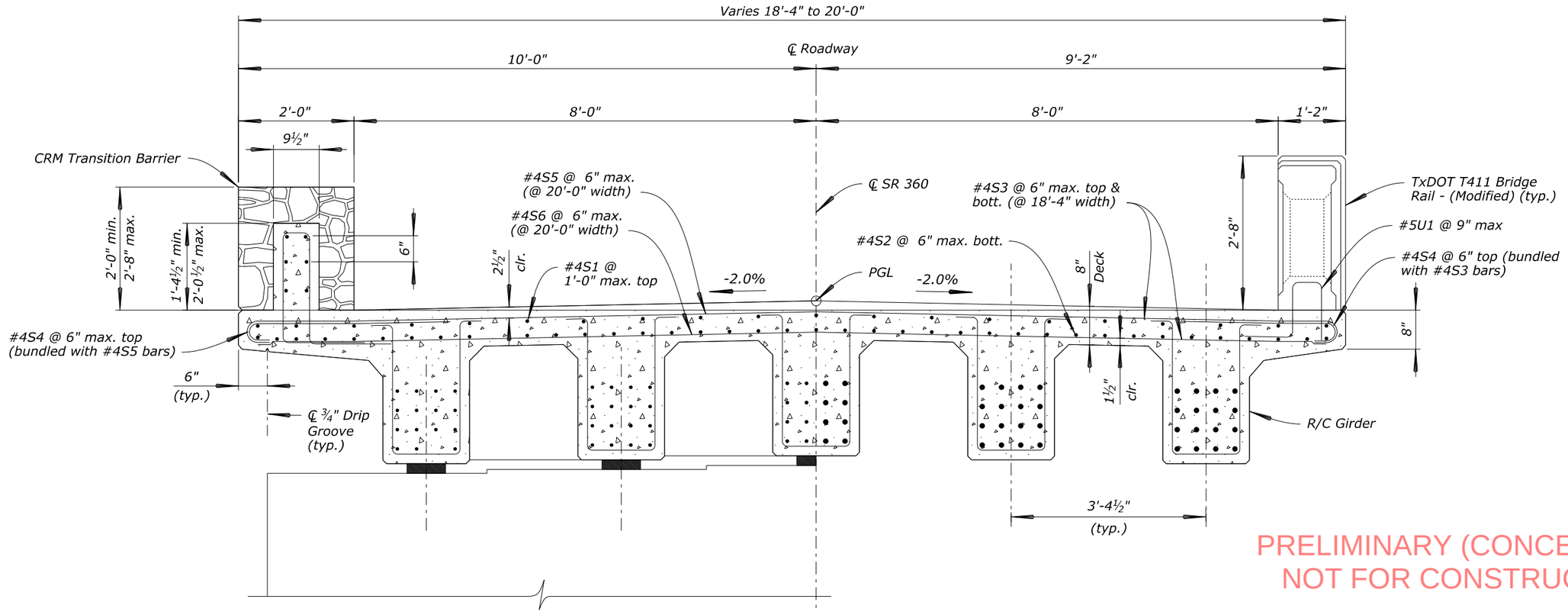
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360(1)	39-S13



TYPICAL SECTION AT ABUTMENT
(End Diaphragm Reinforcement Not Shown)

TYPICAL SECTION AT MIDSPAN

PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

NOTE:

1. *For end diaphragm reinforcing see Sheet RG3218-K.*

TYPICAL SECTION
(Looking Ahead Station, Normal to LOL)

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

ULAINO STREAM BRIDGE (BRIDGE #39)

MAUI COUNTY, HAWAII

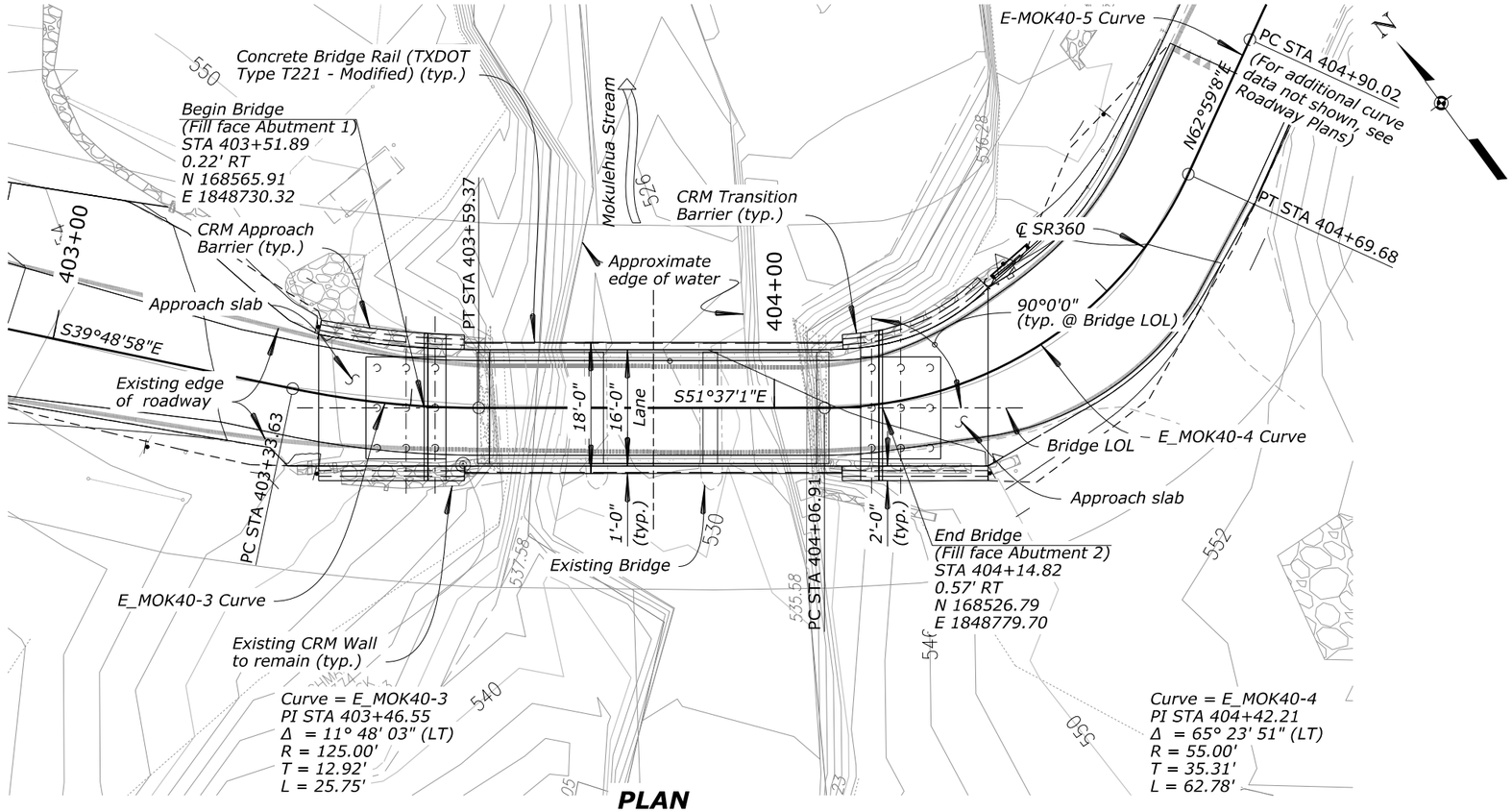
TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								N. DAVIS	B. TERRELL	T. POWERS	1/2" = 1'-0"	T HEFFRON	13 of 24	JANUARY 2022	RG3218-M

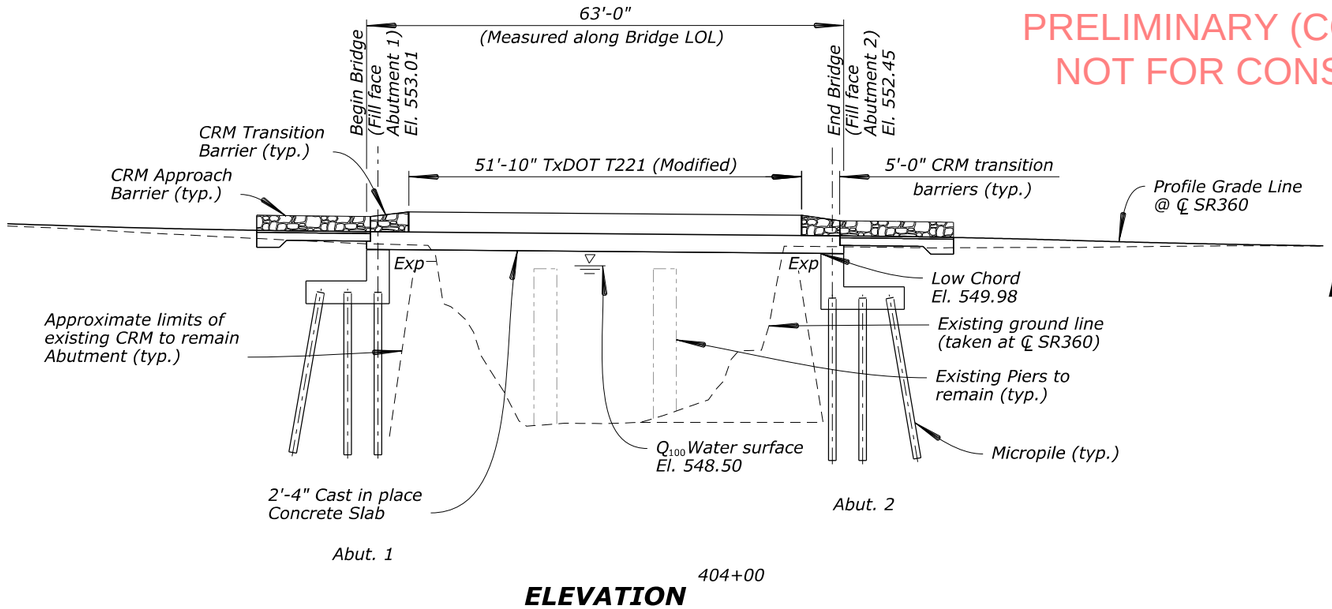
c:\pwworking\central01\d2148071\RG3218-M.dgn
2/16/2022

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	40-S1

INDEX OF DRAWINGS



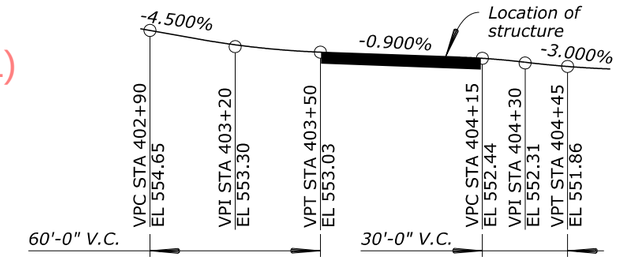
PLAN



ELEVATION

(Elevations taken at ℄ SR360)

PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION



PROFILE GRADE DIAGRAM

No Scale

Elevations are at profile grade ℄ SR 360

HYDRAULIC DATA TABLE

	$Q_{(cfs)}$	$Vm_{(ft/s)}$	WS EL.
Q_2	1757	9.2	539.3
Q_{50}	5707	15.6	548
Q_{100}	6677	16.5	548.5
Q_{500}	9108	18.5	552.4

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

MOKULEHUA STREAM BRIDGE (BRIDGE #40)

MAUI COUNTY, HAWAII

GENERAL PLAN AND ELEVATION

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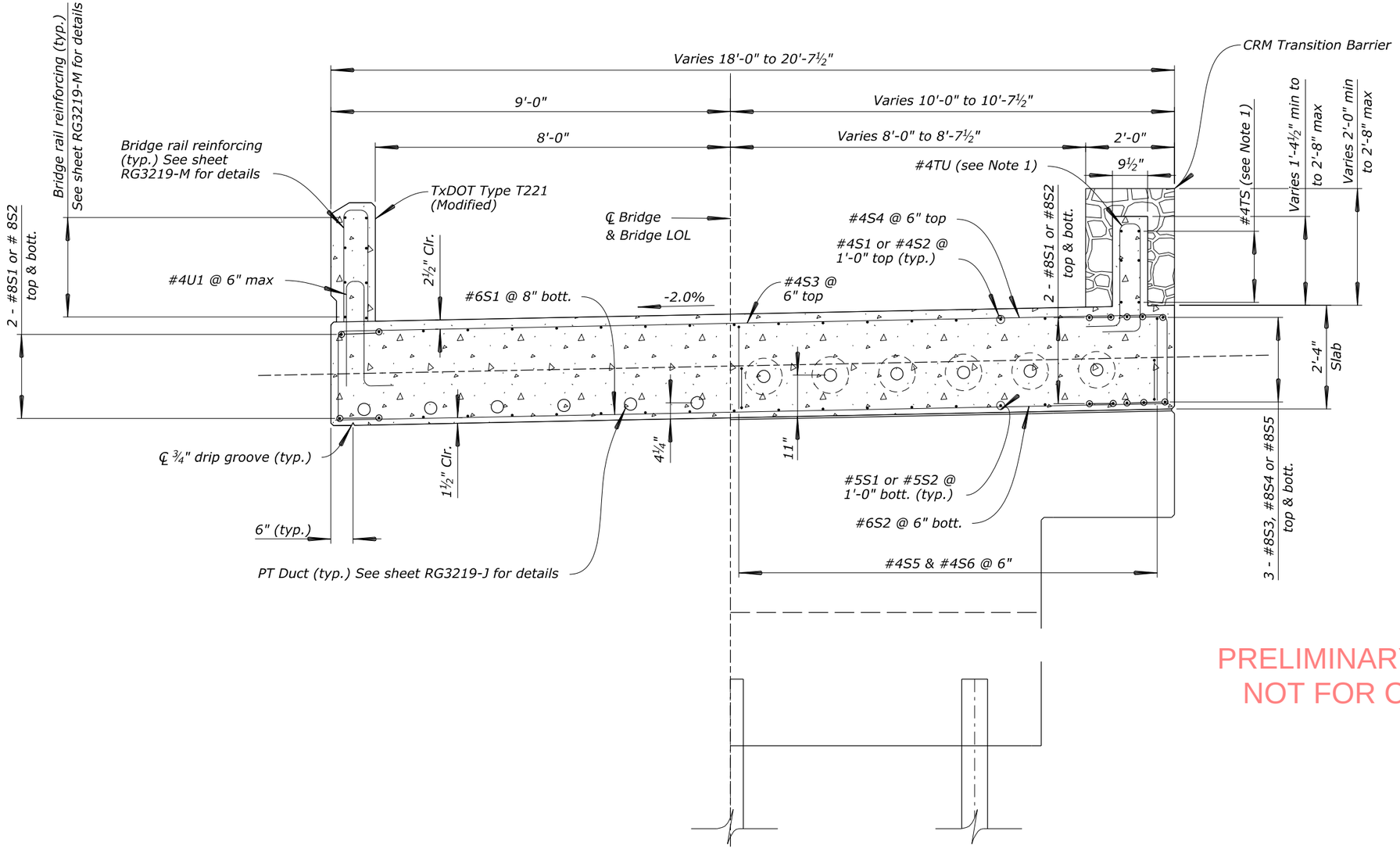
2/16/2022

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								M. DOYLE	P. GREHAN	T. POWERS	1" = 20'-0"	T. HEFFRON	1 of 24	JANUARY 2022	RG3219-A

STATE	PROJECT	SHEET NO.
HI	HI STP SR 360 (1)	40-S12



PRELIMINARY (CONCEPTUAL)
NOT FOR CONSTRUCTION

HALF SECTION AT MIDSPAN ***HALF SECTION AT ABUTMENT***

NOTE:

1. *For CRM Transition Barrier reinforcement details, see sheet RG3219-S.*

TYPICAL SECTION
(Looking ahead station, normal to Bridge LOL)

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HANA HIGHWAY BRIDGE IMPROVEMENTS

MOKULEHUA STREAM BRIDGE (BRIDGE #40)

MAUI COUNTY, HAWAII

TYPICAL SECTION

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								M. DOYLE	P. GREHAN	T. POWERS	¼" = 1'-0"	T. HEFFRON	12 of 24	JANUARY 2022	RG3219-L

c:\pwworking\central01\d2148072\RG3219-L.dgn
2/16/2022

Appendix B.

Archaeological Inventory Survey

SCS Project Number 2295-5 AIS

ARCHAEOLOGICAL INVENTORY SURVEY FOR THE HĀNA HIGHWAY BRIDGE IMPROVEMENT PROJECT PU‘UOMĀILE AND PĀPA‘A‘EA, EAST MAKAĪWA, KŌLEA, LOILOA, KALIAE, KEKUAPAWELA, ‘ULA‘INO, AND MAKAPU‘U AHUPUA‘A, HĀMĀKUALOA AND KO‘OLAU DISTRICTS, ISLAND OF MAUI

TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Prepared by:
Ian Bassford, B.A.,
Cathy Dagher, B.A.,
Emily Opack, B.A.,
and
Michael Dega, Ph.D.

June 2020
Revised June 2023

Prepared for:
U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380A
Lakewood, CO 80228-2583
Tomasz.kubicz@dot.gov

SCIENTIFIC CONSULTANT SERVICES, Inc.

HAWAII

1347 Kapiolani Blvd., Suite 408 Honolulu, Hawai`i 96814

ABSTRACT

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is performing environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the Island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopili`ula Stream Bridge (MP 21.7) and staging area, `Ula`ino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3).

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey (AIS) within the defined Area of Potential Effect (APE) for the improvement of six historic bridges along the highway. The locations within the APE are considered potential temporary and permanent impact areas comprising a total 8.8 acres, including the Hāna Highway right-of-way. This AIS included archival and background research and full pedestrian survey within the APE, which encompasses six bridge locations and one additional non-contiguous staging area near one of the bridge locations. No subsurface testing occurred at any of the locations.

This AIS was prepared to assist FHWA in compliance with Federal environmental and historic preservation review legislation. The project is considered a Federal undertaking due to U.S. Department of Transportation funding. The report has been prepared to meet the *Secretary of Interior's Standards for Archaeology and Historic Preservation* and to meet requirements of Chapter 6E-8.

The Hāna Belt Road is listed in the National Register of Historic Places (National Register Reference # 01000615 and SIHP # 50-50-va-01638) under Criteria a and c. In addition, the East Maui Irrigation (EMI) system (SIHP # 50-50-07-01508) have been previously assessed in 1992. All historic properties (or features of historic properties) identified within the APE are associated with either the Hāna Belt Road or the EMI system**.**

Fieldwork led to the identification of multiple features at three bridge locations: Mokulehua Stream Bridge (two features), Kopili`ula Stream Bridge (5 features), and Puohokamoa Stream Bridge (two features). No features other than the roadway and bridges themselves were identified in the APE at Kailua, Makanali, or `Ula`ino Stream Bridges.

All identified features (9) are Historic-era structures, most being directly associated with the highway and bridge locations. The new features are subsumed under three different site numbers. These features have been evaluated in accordance with criteria established by the National Register of Historic Places and have all been assessed as significant under Criteria A and C, and under State of Hawaii criteria under a and c as well. No additional archaeological work is recommended for this project as all six APE have been fully surveyed and evaluated. Contributing elements of the Hāna Belt Road, including the bridges themselves and associated features, and the East Maui Irrigation system are located within the APE. Recommended effects resulting from this project include potential adverse effects to one or more of the bridges proposed for improvements. Continued consultation with the SHPD for review and approval of proposed designs is recommended. If adverse effects are determined and cannot be avoided or minimized, appropriate mitigation activities should be defined in a Memorandum of Agreement for the undertaking.

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INTRODUCTION

Scientific Consultant Services, Inc. (SCS) conducted archaeological inventory survey (AIS) within the Areas of Potential Effect (APE) for the Hāna Highways Bridge Improvement Project in various ahupua`a in Hamakualoa and Ko`olau Districts, Island of Maui (various TMK) (Figures 1 through 7). The six bridges have been assessed as requiring improvement in a context-sensitive manner, so they remain functional for highway users, specifically for local and regional communities. These six bridges were identified by the State of Hawaii Department of Transportation (HDOT) as high priority for improvements. The identified goals of improving the bridges including making them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the HDOT, is performing environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9) [TMK: (2) 2-9-010:001, (2) 2-9-014:001, (2) 2-9-012:041, (2) 2-9-013:015], Makanali Stream Bridge (MP 8.2) [TMK: (2) 1-1-001:036 and 042], Puohokamoa Stream Bridge (MP 11.0) [TMK: (2) 1-1-001:022, 023, 044 and 052], Kopili`ula Stream Bridge (MP 21.7) [TMK: (2) 1-2-001:003; (2) 1-2-004:005], `Ula`ino Stream Bridge (MP 27.9) [TMK: (2) 1-2-003:001 and 005], and Mokulehua Stream Bridge (MP 28.3) [TMK: (2) 1-2-003:001, 005; (2) 1-3-002:020 and 023] additional potential staging areas [TMK: (2) 1-2-001:003 and (2) 1-2-004:005]. SCS conducted AIS within the defined Areas of Potential Effect (APE) for each of the six historic bridges. The APE considered potential temporary and permanent impact areas and comprised a total 8.8 acres, including the Hāna Highway right-of-way.

The archaeological work included archival and background research and full pedestrian survey within the six APE. No subsurface testing occurred at any of the six bridge locations. Historic-era features (N=9) were documented at three of the six bridge locations. Note: the bridges themselves were not documented further as part of this AIS-study as they have been fully documented and recorded previously. Fieldwork was conducted on an intermittent basis in October and November 2019 by Ian Bassford, B.A. and Emily Campbell, B.A., under the overall direction of Michael Dega, Ph.D., Principal Investigator. The AIS was performed in order to identify and document all historic properties in the APE, to gather sufficient information on the sites in order to evaluate the significance of the identified historic properties, and to compile the information in accordance with the Secretary of Interior's Standards for Archaeology and Historic Preservation and Hawaii Administrative Rules (HAR) § 13-276.

APE LOCATION AND ENVIRONMENTAL SETTING

The APE for this project contains seven separate locations (six bridges and a staging area), with the distance between the furthest bridges being 22.4 miles (Kailua Stream Bridge at MP 5.9 to Mokulehua Stream Bridge at MP 28.3). As such, there are micro-environments and climates along this 22-mile stretch. Each bridge location is described individually below.

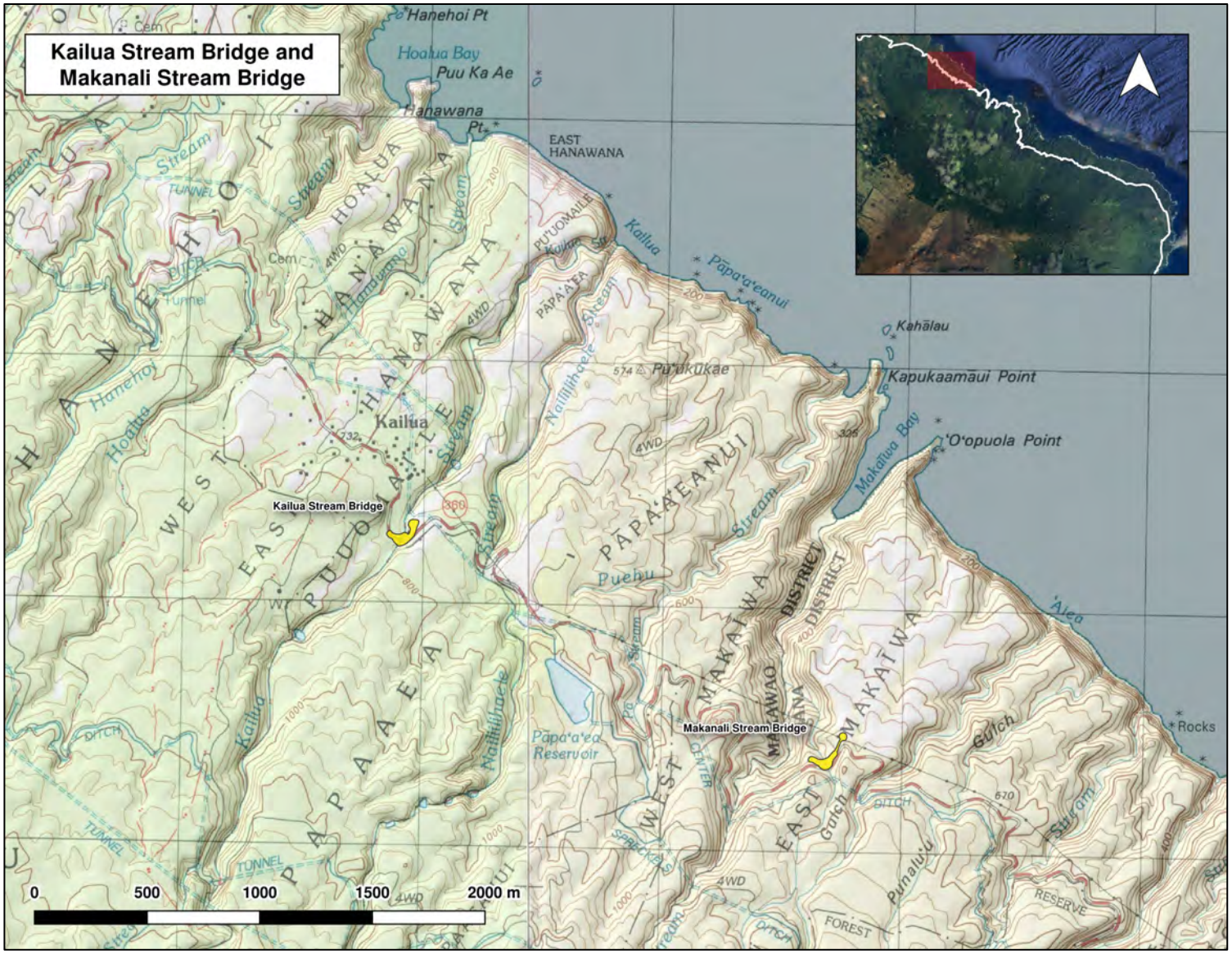


Figure 1: Portion of 1998 USGS Map Showing Locations of Kailua Stream Bridge and Makanali Stream Bridge.

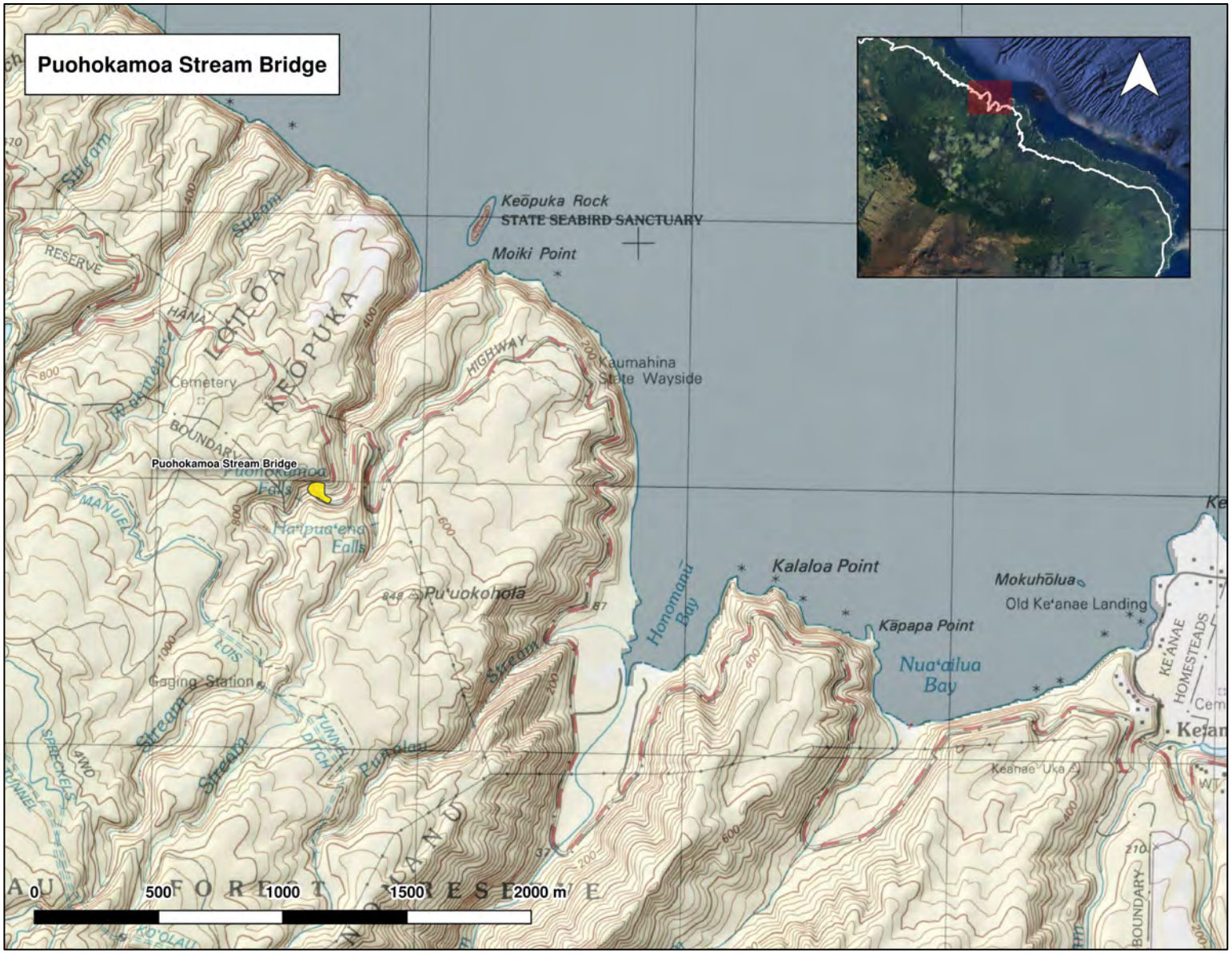


Figure 2: Portion of USGS Map Showing Locations of Puohokamoa Stream Bridge.

Figure 3: Portion of USGS Map Showing Locations of Kopili`ula Stream Bridge and Staging Area.

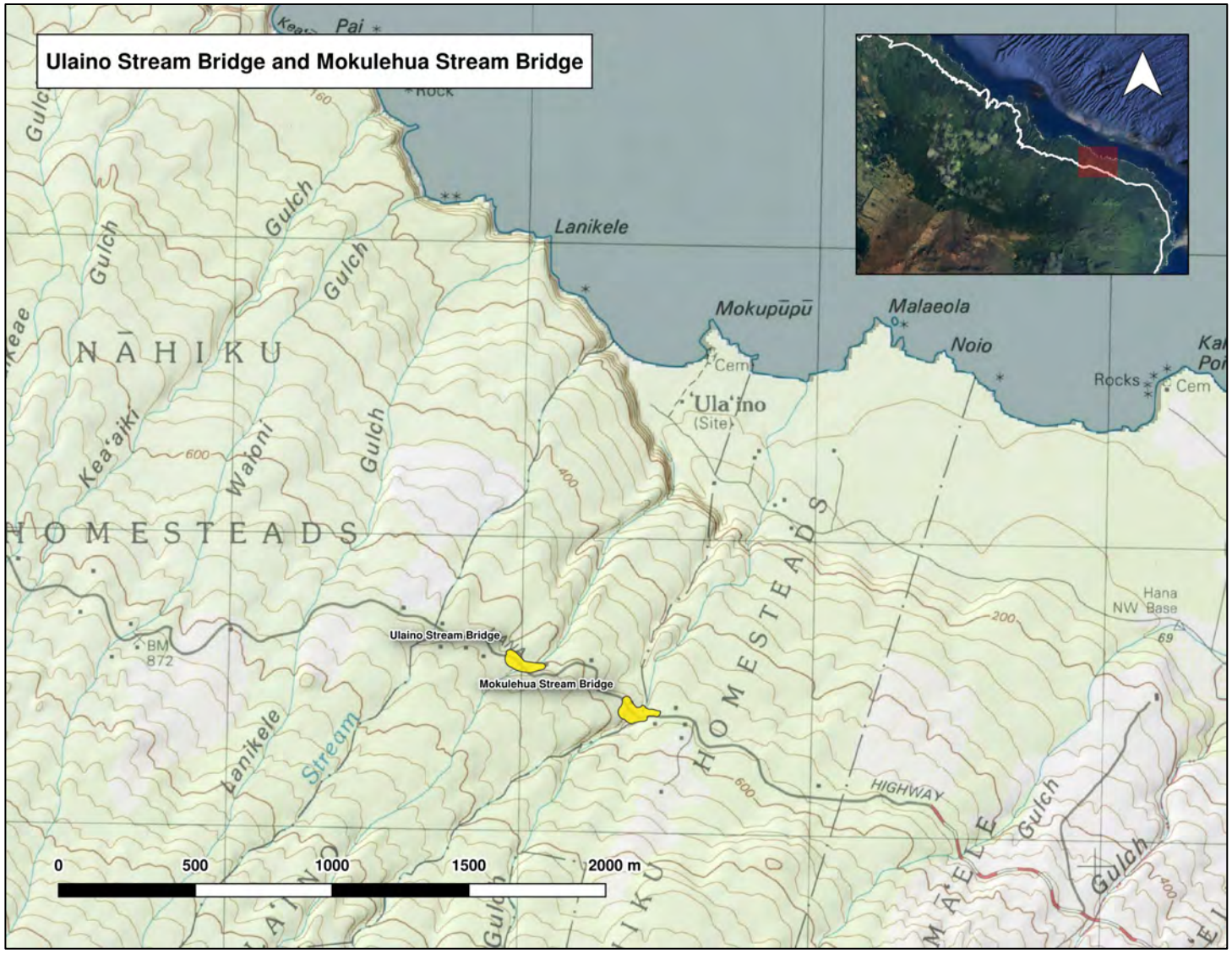


Figure 4: Portion of USGS Map Showing Locations of `Ula`ino Stream Bridge and Mokulehua Stream Bridge.

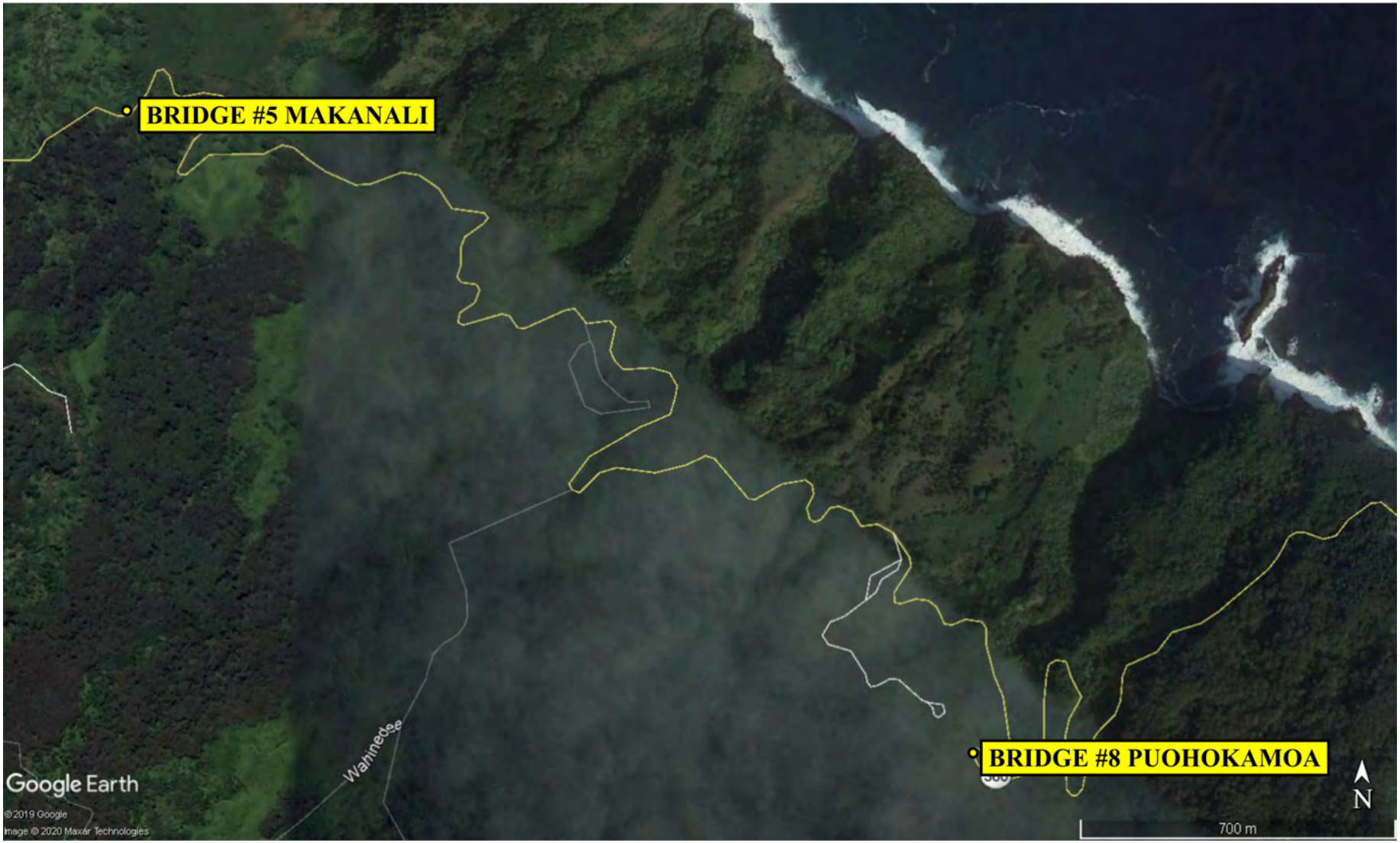


Figure 5: Aerial Photograph Showing the Locations of Bridges 5 and 8.

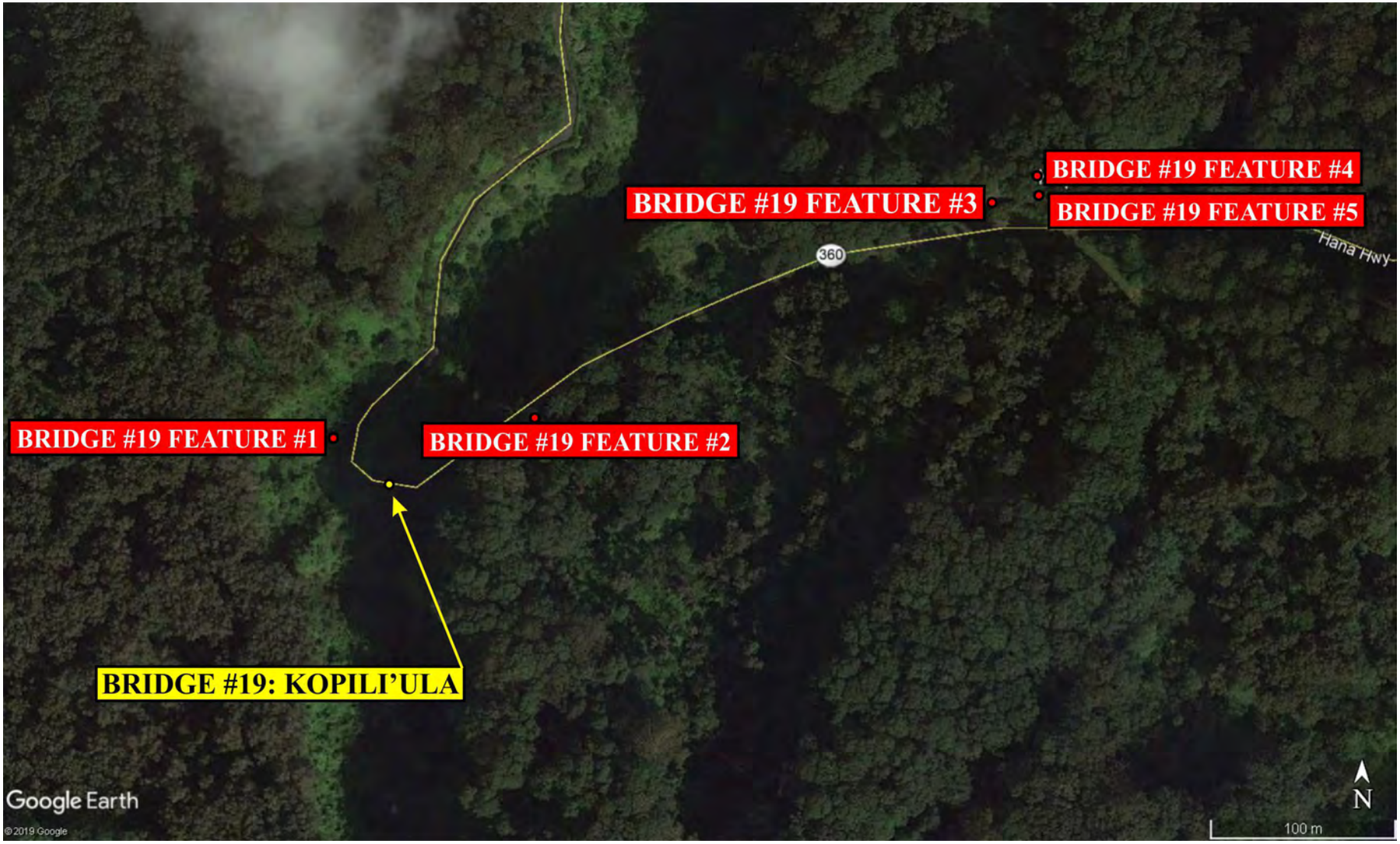


Figure 6: Aerial Photograph Showing Locations of Bridge 19, Bridge 19 Staging Area and the 5 Features Associated with These Locations.

Figure 7: Aerial Photograph Showing Locations of Bridges 39, Bridge 40, and the Two Features Associated with Bridge 40.

KAILUA STREAM BRIDGE

Bridge #2 was constructed in 1929 along Hāna Highway and is located in the Pu`uomāile and Pāpa`a`ea Ahupua`a at milepost (MP) 5.9 [TMK: (2) 2-9-010:001, (2) 2-9-014:001, (2) 2-9-012:041, (2) 2-9-013:015], 6.26 miles west of Kaumahina State Wayside Park Road crossing over the shallow, low-sloping Kailua Stream (Figures 8 through 10). This area receives a mean annual rainfall of 3358.7 mm (132.23 in). The bridge is surrounded by dense vegetation described as Hawaiian introduced wet-mesic forest, a grassy hill, and is adjacent to a single residence. The mean annual temperature is 21.429 °C (70.572 °F) with a high of 23.907 °C (75.034°F) in the summer months and a low of 19.92 °C (67.85 °F) in the winter months. Kailua stream bridge is situated 1.43 km (0.90 mi) from the coast and is 727 ft above sea level.

Figure 8: 1998 USGS Map of Kailua Stream Bridge.

Figure 9: Google Earth 2019 Aerial Image of Kailua Stream Bridge 2 and Area of Potential Effect.

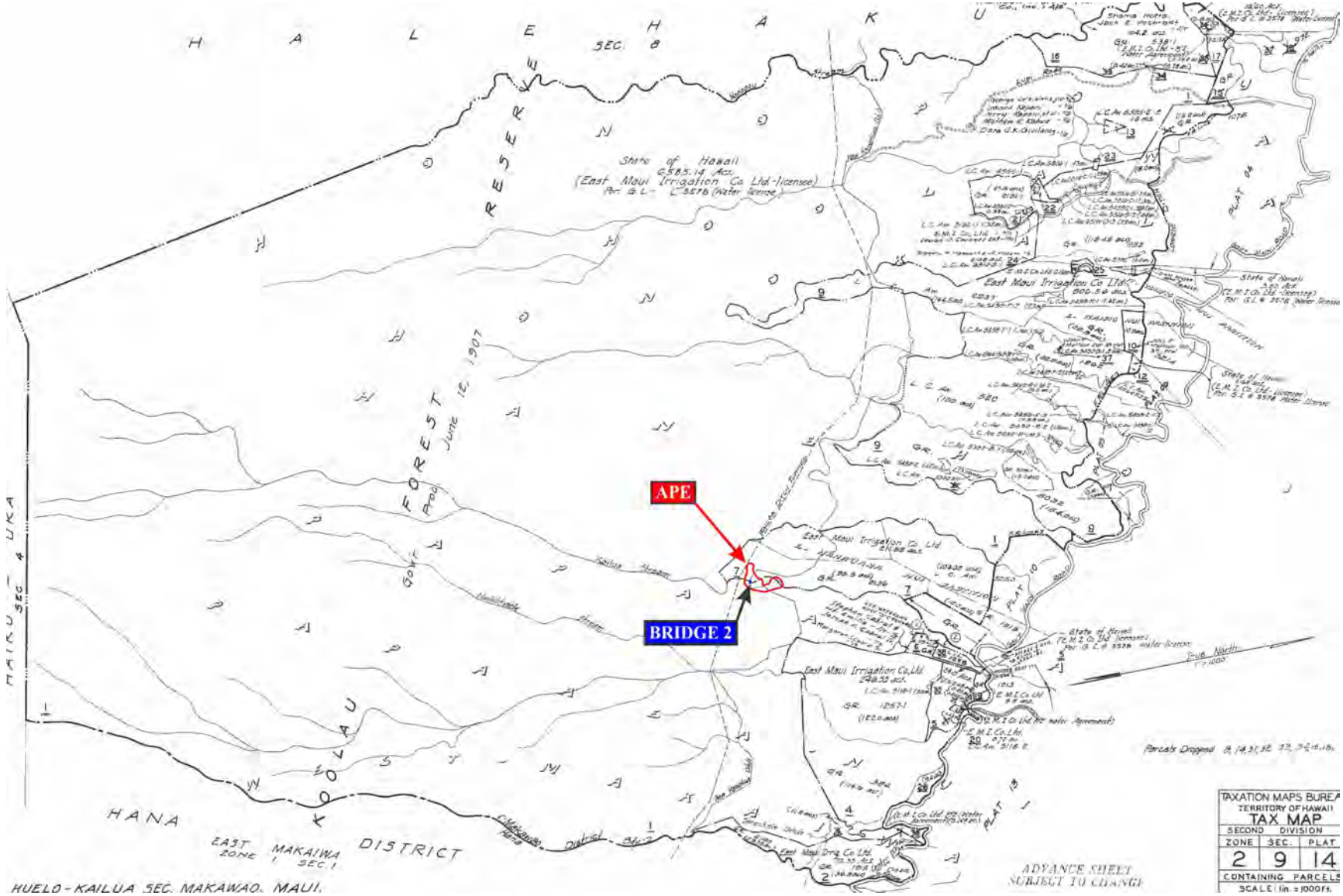


Figure 10: TMK of Map of Kailua Stream Bridge.

MAKANALI STREAM BRIDGE

Bridge #5 was constructed in 1928 along Hāna Highway and is located in East Makaīwa Ahupua`a at MP 8.22 [TMK: (2) 1-1-001:036 and 042], 3.90 miles west of Kaumahina State Wayside Park Road, crossing Makanali Gulch (Figures 11-13). This area receives a mean annual rainfall of 3139.7 mm (123.61 in). The mean annual temperature is 22.113 °C (71.803 °F) with a high of 23.80 °C (74.80 °F) in the summer months and a low of 20.50 °C (68.90 °F) in the winter months. The area includes wooded, yet open valley area, dense vegetation, and land cover described as Hawaiian introduced perennial grassland. Makanali stream bridge is located .20 km (.13 mi) from the coast and is 386 ft above sea level.

Figure 11: 1998 USGS Map of Makanali Stream Bridge.

Figure 12: 2019 Google Earth Aerial Image of Makanali Stream Bridge 5 and Area of Potential Effect.

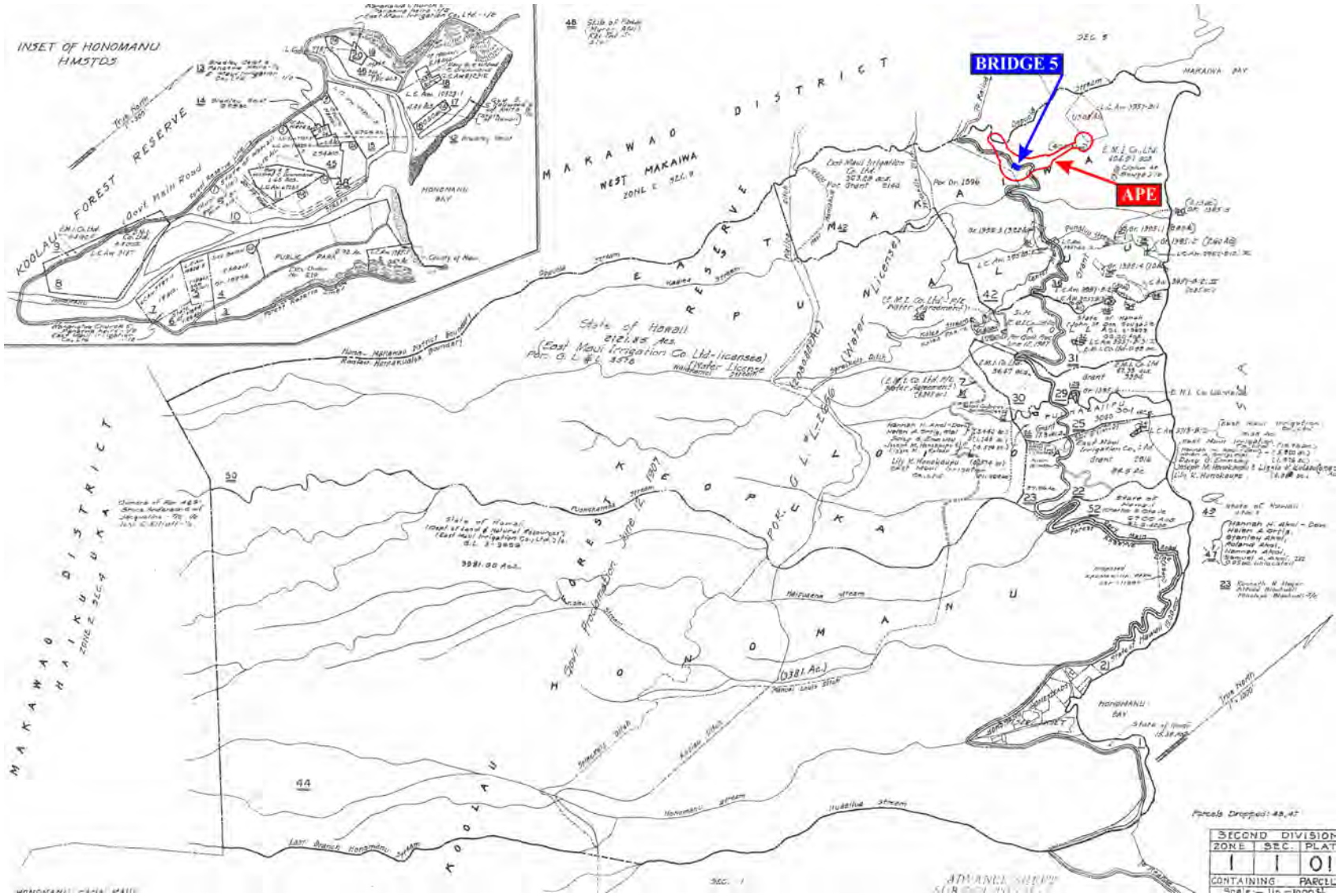


Figure 13: TMK Map of Makanali Stream Bridge.

PUOHOKAMOA STREAM BRIDGE

Bridge #8 was constructed in 1912 along Hāna Highway and is located in Kōlea and Loiloa Ahupua`a at MP 10.95 [TMK: (2) 1-1-001:022, 023, 044 and 052], 1.16 miles west of Kaumahina State Wayside Park Road, crossing over Puohokamoa Stream (Figures 14-16). This area receives a mean annual rainfall of 3759.1 mm (148.00 in). The mean annual air temperature is 21.499 °C (70.7 °F), with a high of 23.32 °C (73.81 °F) in the summer and a low of 19.00 °C (67.99 °F) in the winter. The bridge is built adjacent to an arboretum. There is open but dense groundcover which includes ti leaf plants on the downstream hillside. The bridge is also located adjacent to a private property. Puohokamoa Stream Bridge is located .84 km (.52 mi) from the coast and is 507 ft above sea level.

Figure 14: 1998 USGS Map of Puohokamoa Stream Bridge.

Figure 15: 2019 Google Earth Aerial Image of Puohokamoa Stream Bridge 8 and Area of Potential Effect.

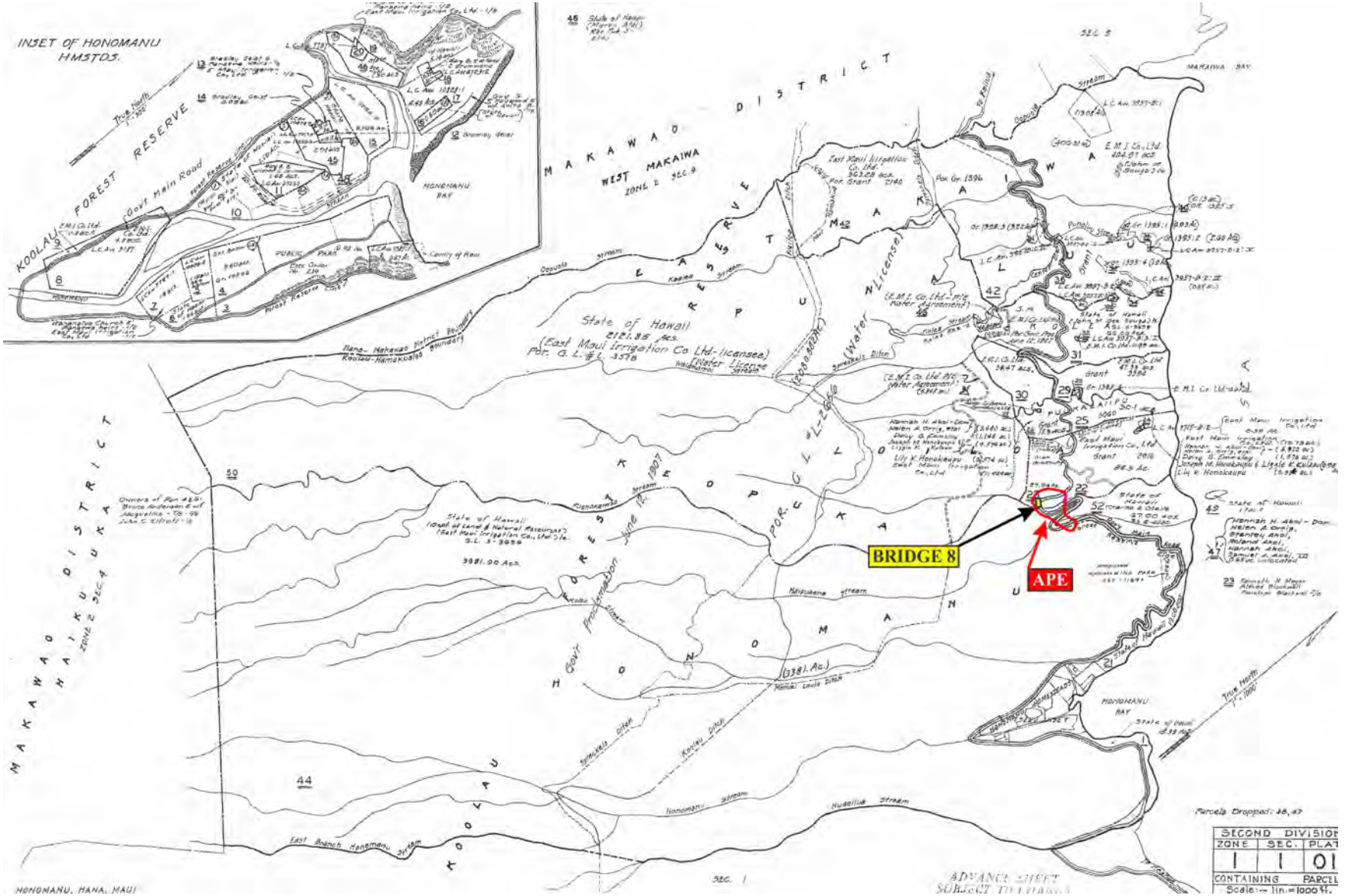


Figure 16: TMK Map of Puohokamoa Stream Bridge.

KOPILI`ULA STREAM BRIDGE

Bridge #19 was constructed in 1926 along Hāna Highway and is located in Kaliae and Kekuapawela Ahupua`a at MP 21.73 [TMK: (2) 1-2-001:003; (2) 1-2-004:005], 2.80 miles east of Wailua Valley Lookout, crossing over Kopili`ula Stream (Figures 17-19). This area receives a mean annual rainfall of 5721.00 mm (225.24 in). The mean annual air temperature is 19.543 °C (67.177 °F) with a high of 20.19 °C (70.14 °F) in the fall and a low of 18.40 °C (65.12 °F) in the Spring. Hawaiian lowland rainforest covers the hillside. The Kopili`ula Stream Bridge is located 2.30 km (1.41 mi) from the coast and is 1286 ft above sea level.

Kopili`ula Stream Bridge is associated with a potential staging area 198.24 meters (.12 mi) to the northeast. This area is covered by the same vegetation and receives roughly the same mean annual rainfall and mean annual air temperature as Kopili`ula Stream Bridge. The potential staging area is approximately 9997 ft above sea level.

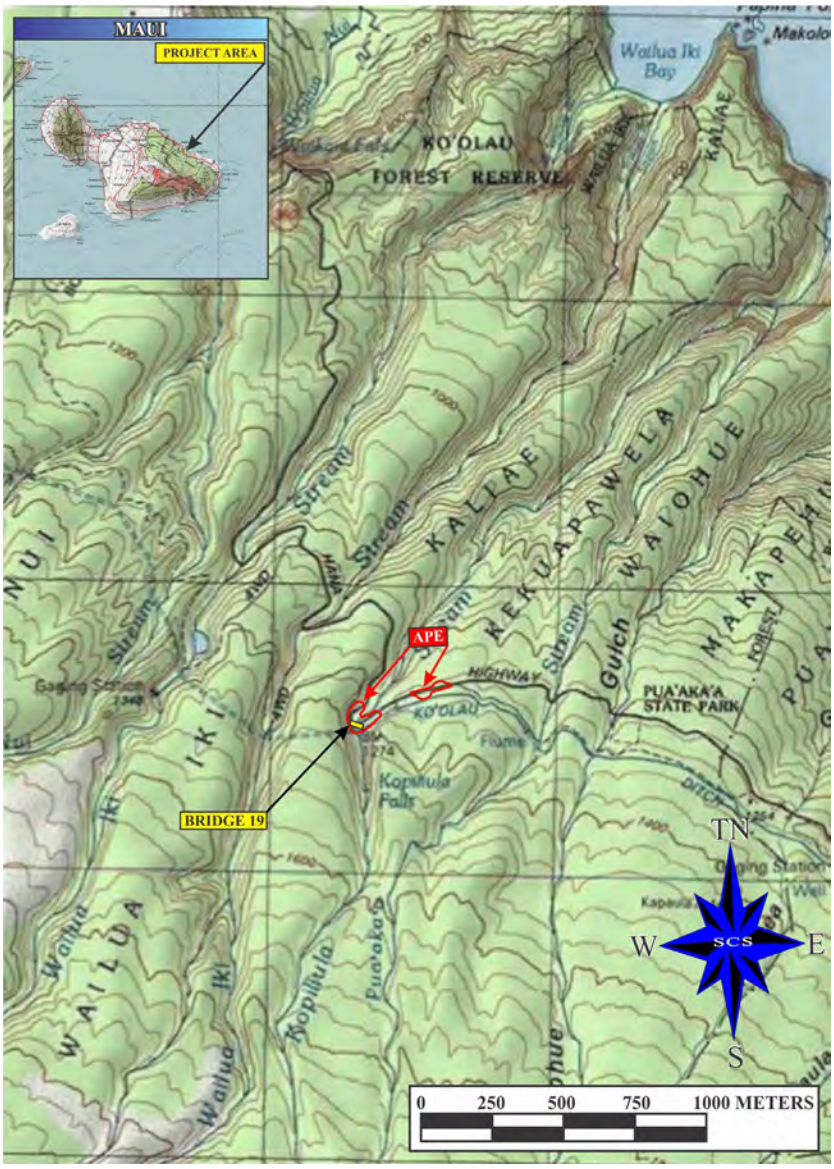


Figure 17: 1998 USGS Map of Kopili`ula Stream Bridge.

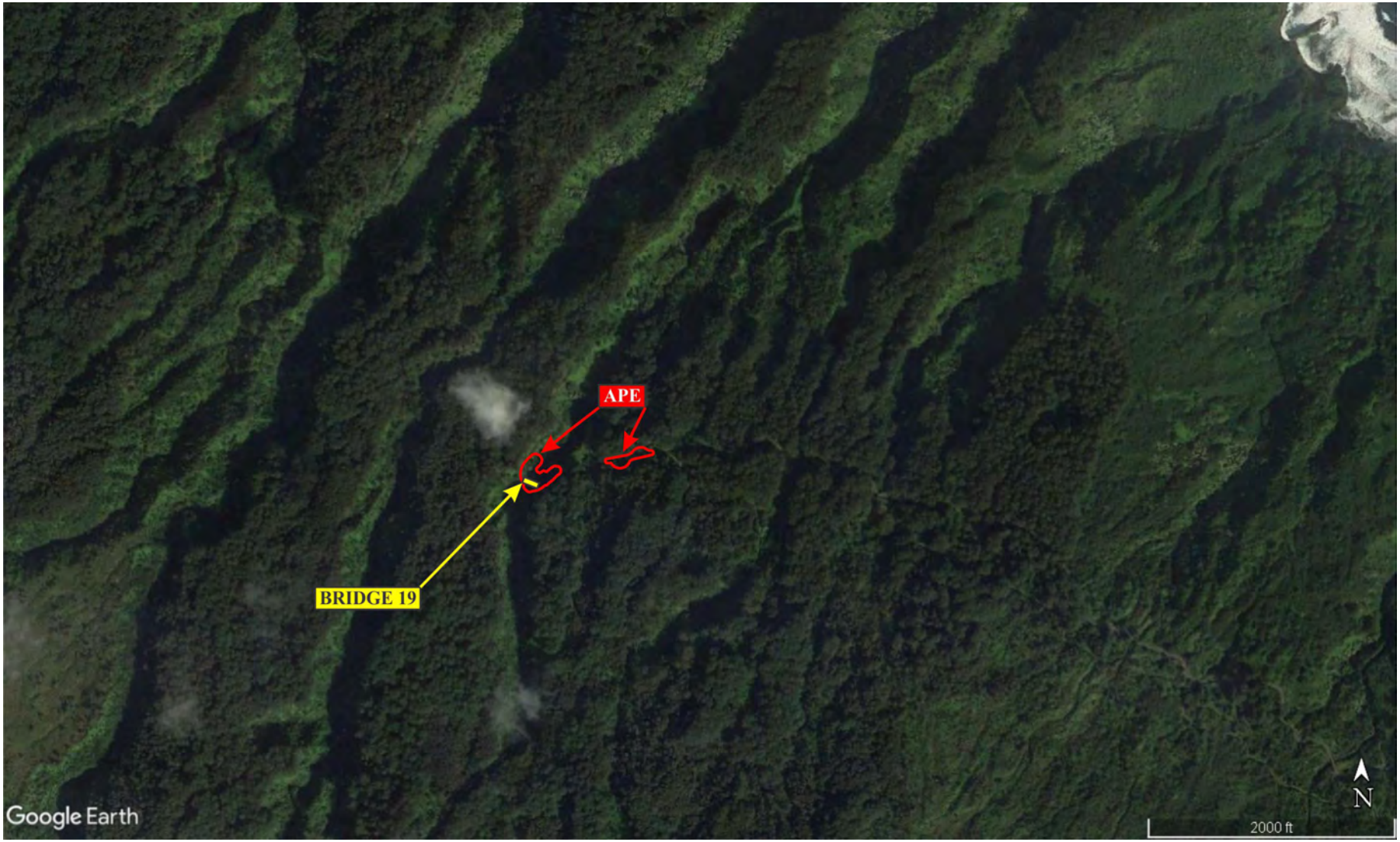


Figure 18: 2019 Google Earth Aerial Image of Kopili`ula Stream Bridge 19 and Area of Potential Effect.

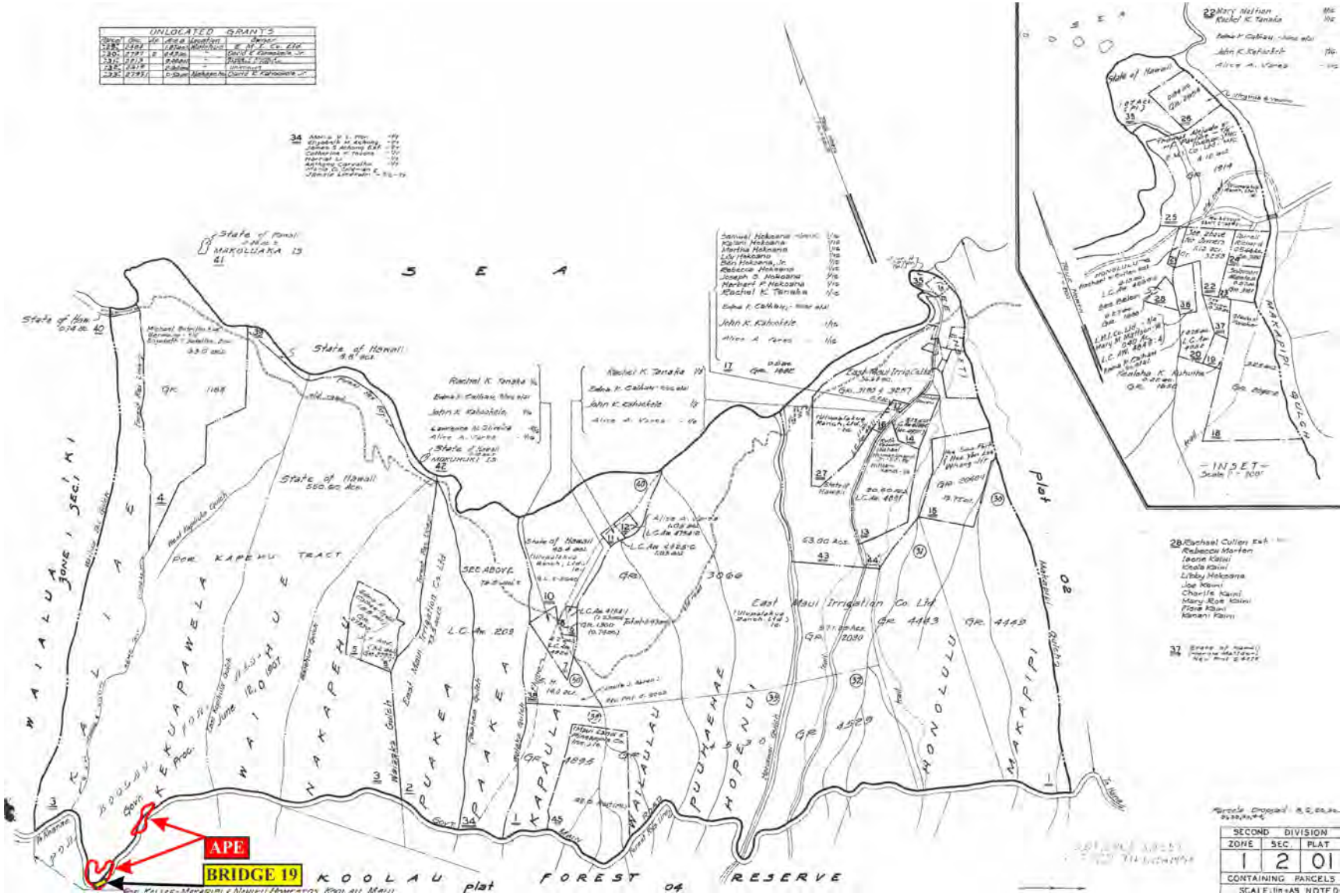


Figure 19: TMK Map of Kopili`ula Stream Bridge.

`ULA`INO STREAM BRIDGE

Bridge #39 was constructed in 1914 and is located in `Ula`ino Ahupua`a at MP 27.9 [TMK: (2) 1-2-003:001 and 005], 2.96 miles east of Lower Nahiku Road, crossing over `Ula`ino Stream (Figures 20-22). This area receives a mean annual rainfall of 2,113.2 mm (161.94 in). The mean annual air temperature is 21.605 °C (70.89 °F) with a high of 23.08 °C (73.54 °F) in the fall and a low of 20.01 °C (68.02 °F) in the Spring. The landcover includes Hawaiian lowland forests. The bridge spans a lava rock stream and is situated adjacent to a rural residential neighborhood. The geographical setting includes open sloping terrain with views of the stream below. This bridge is located 1.04 km (.65 mi) from the coast and is 357 ft above sea level.

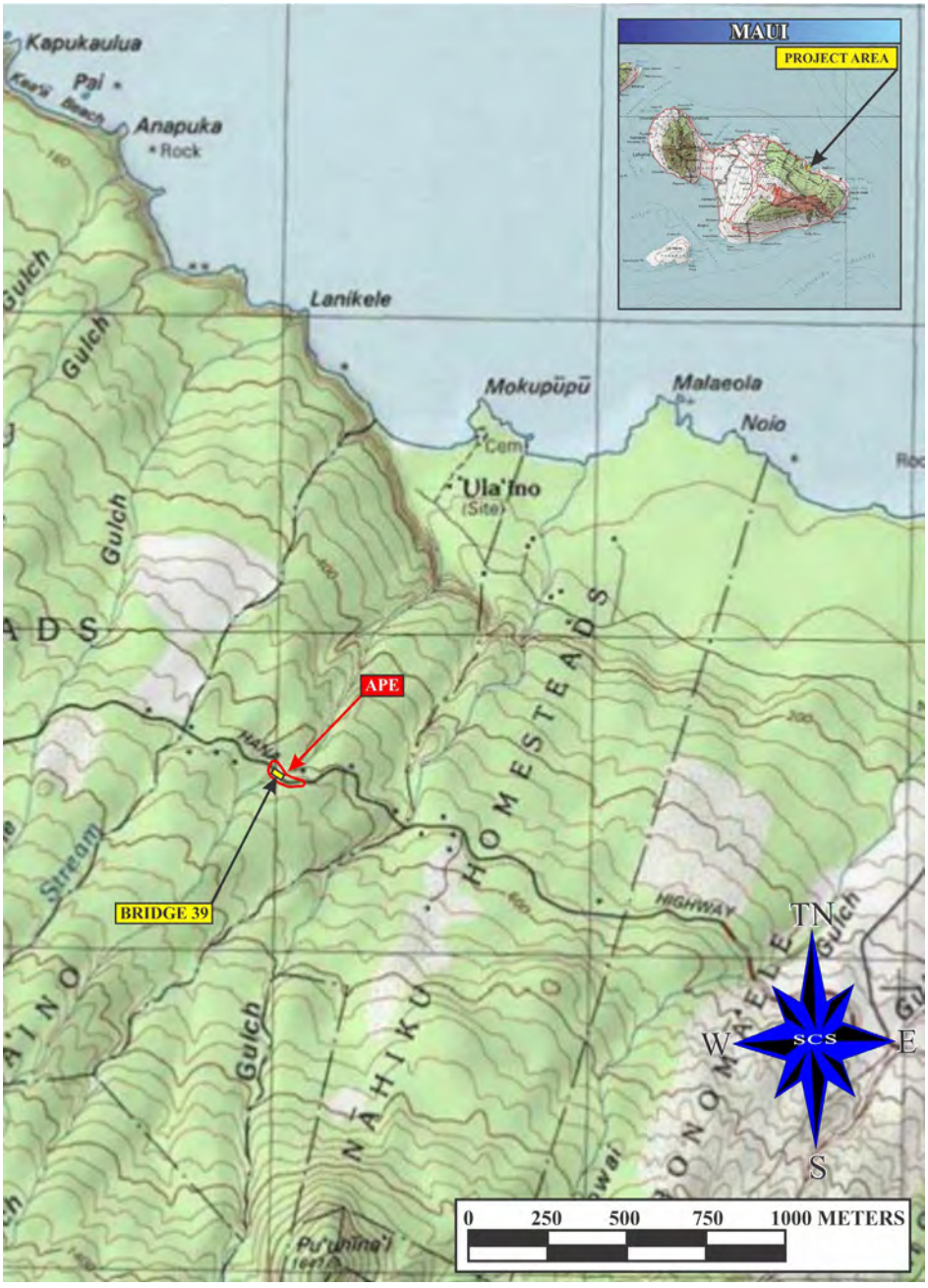


Figure 20: 1998 USGS Map of `Ula`ino Stream Bridge.

Figure 21: 2019 Google Earth Aerial Image of `Ula`ino Stream Bridge Area of Potential Effect.

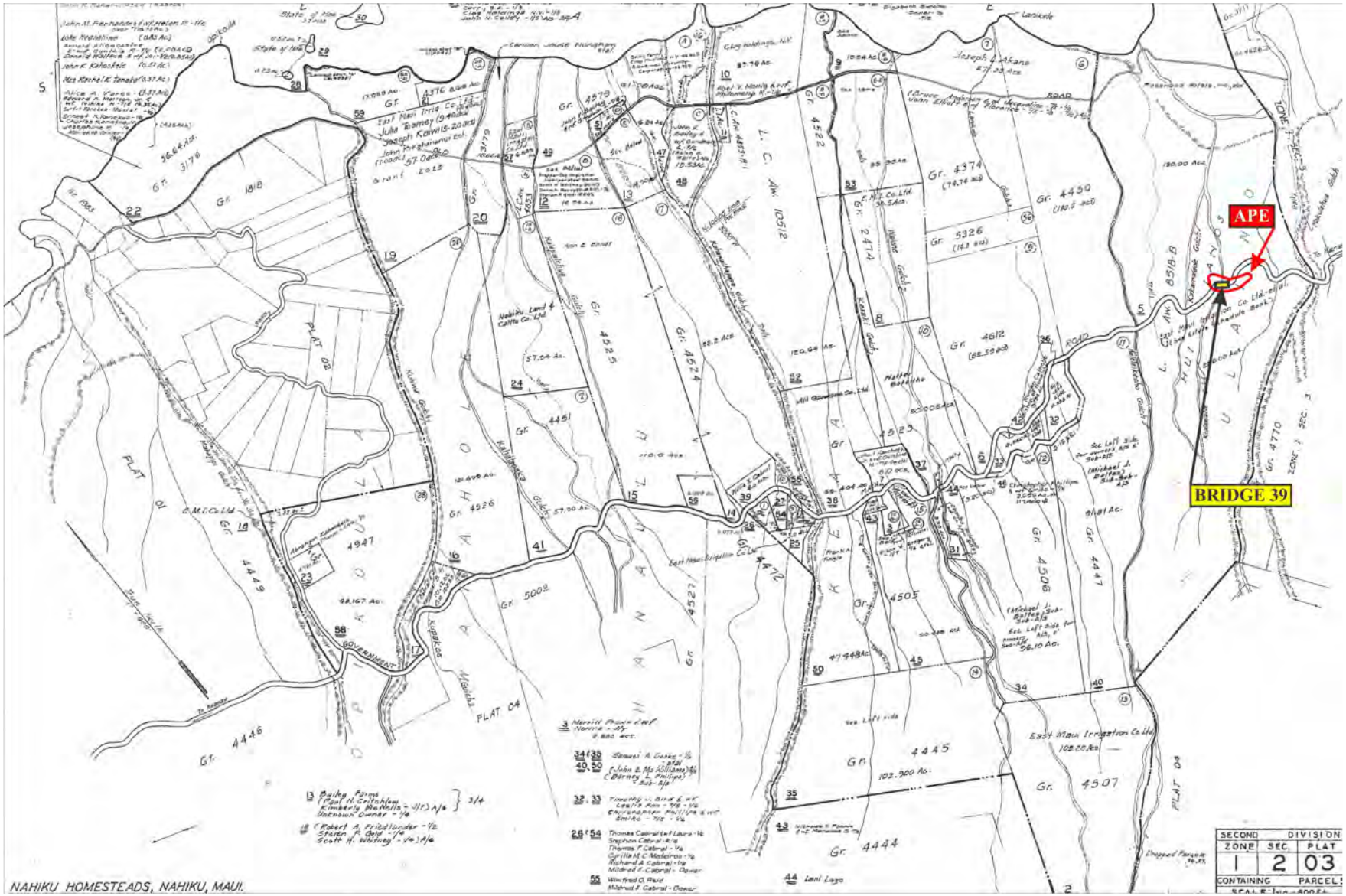


Figure 22: TMK Map of `Ula`ino Stream Bridge.

MOKULEHUA STREAM BRIDGE

Bridge #40 was constructed in 1908 and is located in `Ula`ino and Makapu`u Ahupua`a at MP 28.31 [TMK: (2) 1-2-003:001, 005; (2) 1-3-002:020 and 023]. Additional potential staging areas include TMK: (2) 1-2-001:003 and (2) 1-2-004:005. Bridge #40 is 3.06 miles west of Alalele Place (Road to Hāna Airport), crossing over the Mokulehua Gulch (Figures 23 through 25). This area receives a mean annual rainfall of 4,196.1 mm (165.20 in). The mean annual air temperature is 21.651 °C (70.972 °F) with a high of 23.12 °C (73.62 °F) in the fall and a low of 20.22 °C (68.39 °F) in the winter. The geographic setting includes a rural residential area, a waterfall below the bridge and an open, wide terraced stream. This bridge is located 1.22 km (.75 mi) from the coast and is 840 ft above sea level.

Figure 23: 1998 USGS Map of Mokulehua Stream Bridge.

Figure 24: Mokulehua Stream Bridge Area of Potential Effect.

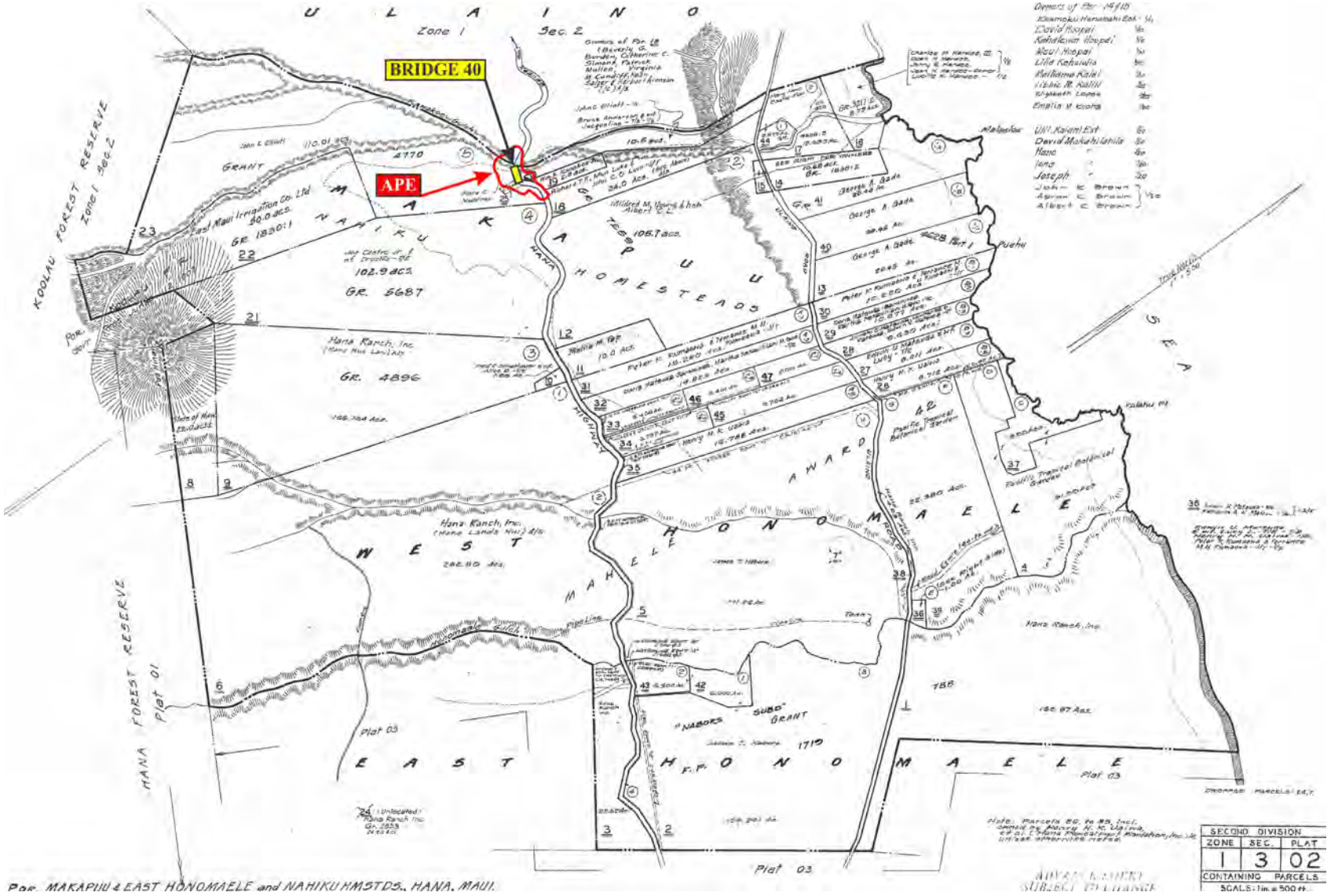


Figure 25: TMK Map of Mokulehua Stream Bridge.

SOIL SERIES

Kailua Stream Bridge (#2), Makanali Stream Bridge (#5), Puohokamoa Stream Bridge (#8), and Kopili`ula Stream Bridge (#19) are associated with Rough Mountainous land (rRT) (Figures 26-29). This series consists of steep land divided by numerous intermittent drainage channels. Elevations range from sea level to above 6,000 feet. The soil mantle in these areas is normally very thin, ranging from 1-10 inches in thickness over saprolite. The land surface is dominated by V-shaped valleys that have extremely steep side slopes and narrow ridges between valleys. The soil material on the ridge tops is similar to that of the Amalu and Olokui series. Vegetation includes ohia, false staghornfern, tree fern, yellow foxtail, lantana, kukuim and puakeawe. This land type is used for water supply, wildlife habitat, and recreation (Foote et al. 1972:118).

The Kopili`ula Stream Bridge staging area is associated with Kailua silty clay (KBID) (See Figure 29). This soil is common on low uplands. Permeability is moderately rapid and erosion hazard is slight. This soil has been used for pasture, woodland, and wildlife habitat.

`Ula`ino Stream Bridge (#39) and Mokulehua Stream Bridge (#40) (see Figures 30 and 31) are associated with Hāna very stony silty clay loam (HKLD). This soil is on smooth, low mountain slopes. The surface layer is very dark grayish-brown silty clay loam about 12 inches thick. The subsoil is dark brown silty clay loam. The surface layer consists of a strong to medium acidity and the subsurface layer is slightly acidic. This soil has been used for pasture (Foote et al. 1972:37).

Figure 26: Google Earth Soil Map for Kailua Stream Bridge (Bridge #2) and APE.

Figure 27: Google Earth Soil Map for Makalani Stream Bridge (Bridge #5) and APE.

Figure 28: Google Earth Soil Map for Puohokamoa Stream Bridge (Bridge #8) and APE.

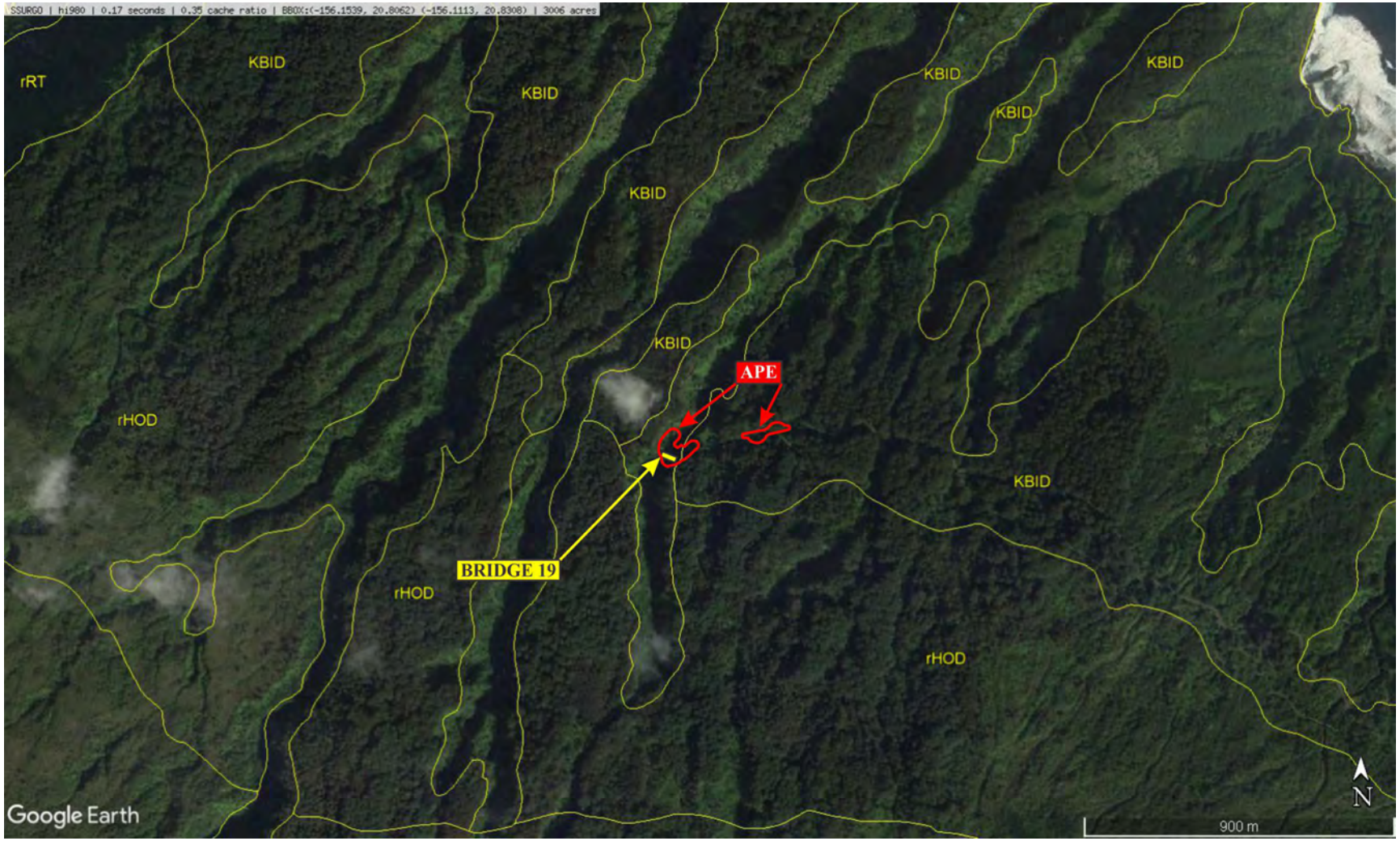


Figure 29: 2019 Google Earth Soil Map for Kopili`ula Stream Bridge (Bridge #19), Staging Area, and APE.

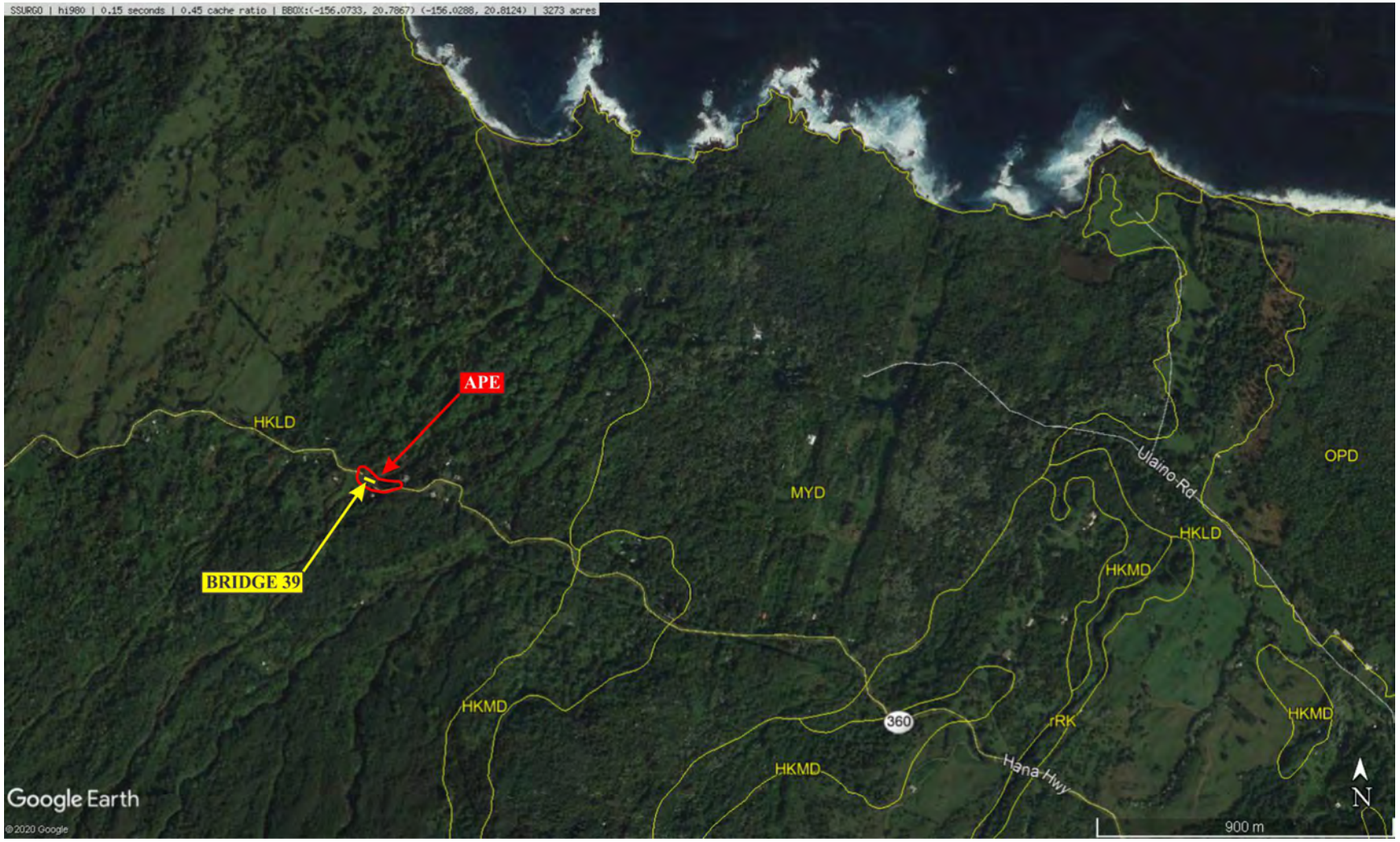


Figure 30: Google Earth Soil Map for `Ula`ino Stream Bridge (Bridge #39) and APE.

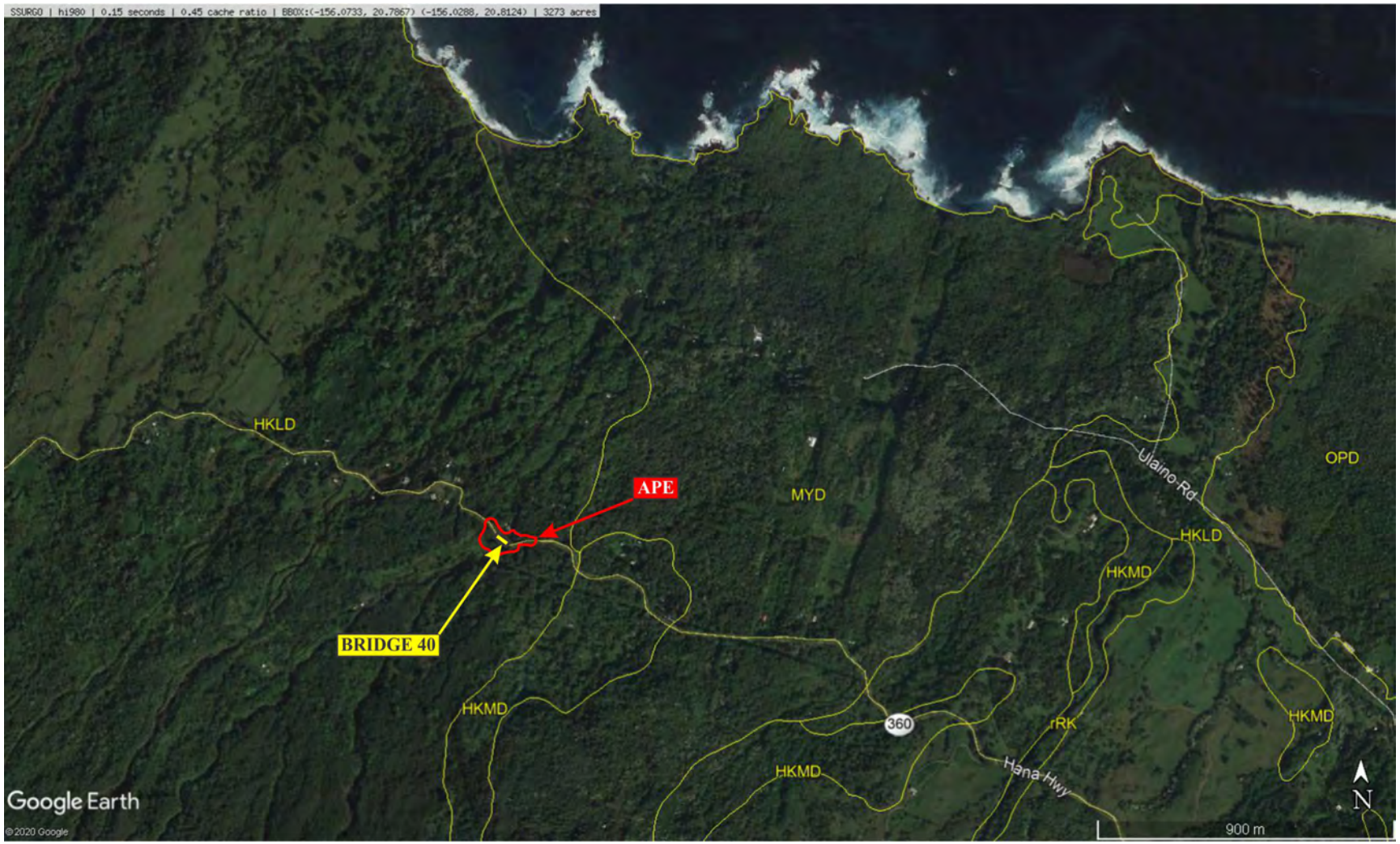


Figure 31: Google Earth Soil Map for Mokulehua Stream Bridge (Bridge #40) and APE.

BACKGROUND BRIDGE INFORMATION

The six bridges themselves have previously been fully documented and summarized, with information provided on the history of each bridge, the archaeological and cultural significance of each bridge location, a review of cultural sites that occurs near each of the bridges, and significance and context of each bridge (Folio et al. 2015). The bridges have also been documented through nomination forms as all occur within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference No. 01000615/SIHP No. 50-50-va-01638). Appendix A provides this document which provides all the background information to this study and is not repeated within the body of this AIS.

FIELD METHODOLOGY

Fieldwork was conducted intermittently between December 10, 2019 and February 5, 2020 by SCS personnel Ian Bassford, B.A. and Emily Campbell, B.A., under the overall direction of Michael Dega, Ph.D. (Principal Investigator). Fieldwork was intermittent due primarily to poor weather conditions in early Winter when rain was common for many days.

Formal survey included 100% pedestrian survey of the seven locations within the APE with the task being to assess the presence/absence of historic properties in the defined APE for each bridge location. The two field crew members walked in axis-oriented transects spaced 5 meters apart as visibility was good, for the most part. Identified sites were flagged and recorded in written notes. Sub-meter accurate GPS (Garmin with antenna) was utilized to record each transect and the location of each identified site, feature, and flagging placement on the site.

Site recordation consisted of having all identified properties and component features in each of the six bridge locations and staging area mapped to scale using tape, compass, and sub-meter accuracy GPS (Garmin with antenna). Completed site forms discussed site type and function, assessed age, feature condition, and other factors.

No subsurface testing was completed during this course of fieldwork. Numerous photographs of the project area were taken in addition to written notes and descriptions of previously undocumented features, as well as the topography and natural environment.

CONSULTATION

Section 106 consultation with the community, agency, and Native Hawaiian Organizations has been initiated and is ongoing. SHPD has been consulted for 6E process and Section 106. FHWA-CFLHD has provided project information and sought knowledge relative to potential historic properties and sites that may be of religious and cultural significance to Native Hawaiian Organizations, other potential consulting parties, and the community. Two series of public meetings have been held along the Hāna Highway corridor, in addition to consultation meetings with SHPD and other consulting parties, including the Maui County Cultural Resources Commission and Historic Hawaii Foundation. These meetings were held in March 2019 and January/February 2020 and are a supplement to extensive community and agency consultation efforts included as part of the overall 2015 Preservation Plan Project for State Bridges within the Hāna Belt Road Historic District. Consultation efforts will continue through the Section 106 and project development process (N. Winterton, pers. communication, 2020).

No groups brought new properties or significance considerations to attention. Section 106 consulting parties discussed efforts to minimize potential effects to the Hana Belt Road district and the bridges themselves during the improvement project. Character-defining features that were past documented were

revisited and received no disagreement. Primary interest from the public has been on construction impacts, aesthetics of the bridges, bridge longevity, and maintaining the "feel" of the roadway corridor so as to maintain the unique character and also to not encourage increased development (N. Winterton, pers. communication, 2020)

INVENTORY SURVEY RESULTS

The AIS resulted in the identification of nine Historic era features within the APE. These nine features are associated with two existing sites (Site -01638, -01509) and one newly identified site (TS-1). These include one newly identified site near Mokulehua Bridge and newly identified features associated with Mokulehua bridge, Kopili`ula Bridge, Kopili`ula Staging Area, and Puohokamoa Bridge. No properties that have not been previously recorded were identified at Kailua Bridge, Makanali Bridge or `Ula`ino Bridge. Each of the sites contained multiple features. All were assessed as from the Historic-era, most being directly affiliated with Hana Belt Road. Table 1 summarizes the newly identified sites and their location.

Table 1: Identified Sites and Descriptive Information per each Bridge APE (*TS=Temporary Site Number)

Bridge Name	Site/Feature No.	GPS Coordinates	Type/Age	Function
Mokulehua	*TS-1, Feature 1	E0806395 N2302442	House foundation with wall and slab; Historic	Post and Pier house foundation
Mokulehua	SIHP#: 50-50-13-01638, Feature 1	E0806373 N2302434	Retaining wall; Historic	Retains highway grade of Hāna Belt Road
Kopiliula	SIHP#: 50-50-v12-01638, Feature 1	E0798284 N2304563	Road cut; Historic	Part of EMI Network (SIHP 50-50-07-01508)
Kopiliula	SIHP#: 50-50-v12-01638, Feature 2	E0798393 N2304576	Culvert; Historic	Stacked-rock walls; water flows beneath roadway
Kopiliula (Staging area)	SIHP#: 50-50-v12-01638, Feature 3	E0798637 N2304689	Boulder alignment; Historic	Kerb-stones assoc. with old roadway alignment
Kopiliula (Staging area)	SIHP#: 50-50-v12-01638, Feature 4	E0798661 N2304713	Boulder alignment; Historic	Kerb-stones assoc. with old roadway alignment

Kopiliula (Staging area)	SIHP#: 50-50-v12-01638, Feature 5	E0798663 N2304703	Boulder alignment; Historic	Kerb-stones assoc. with old roadway alignment
Puohokamoa	50-50-07-01509, Feature 1	E0793555 N2309969	Terrace walls, enclosures; Historic	Assoc. with Scenic Lookout for Lower Puohokamoa Falls
Puohokamoa	50-50-07-01509, Feature 2	E0793555 N2309969	Culvert; Historic	Stacked-rock wall; water flows beneath roadway

MOKULEHUA BRIDGE: SIHP # 50-50-13-01638

Survey of the APE for Mokulehua Bridge led to the identification of one new site near the bridge (SIHP # Pending), and one newly identified feature associated with the bridge. Feature 1 of Temporary Site 1 consists of a concrete foundation and adjoining wall representing the remnant of an Historic-era house. Feature 1 of the previously identified site, Mokulehua Bridge, consists of a stacked retaining wall along the highway.

Temporary Site 1 represents the foundation of an old historical house from the c. 1920s or 1930s, the only empirical surface evidence being entry way and/or lanai and lower retaining wall (Figures 32-34). The feature is in fair to good condition (what's left of it) and has been altered by erosion/weathering, manual labor (tear down of the residence), modern construction, and gravity. The feature measures 15 m x 14 m (210 m^2) on the exterior and 10.2 m x 2.3 m (23.46 m^2) on the interior. Three masonry styles were identified in these elements. The lower stairs and lower retaining wall were constructed of pour in place concrete. The entry way walls were constructed of medium-size water worn cobbles with grout. The entry walls were also capped with rectangular concrete measuring 8 cm thick and 33 cm wide. The feature is located approximately 20 meters northeast of the Hāna Belt Road and approximately 30-40 meters north of Mokulehua Bridge. There are only these remnants remaining of the former house, which was built with easy access to the road.

Feature 1 of SIHP# 50-50-13-01638 is a retaining wall composed of medium to large cobbles and small boulders 3-4 courses high (Figure 35). The feature is in fair condition, having been altered by mechanical means (modern construction repairs) and erosion. The wall is 30 m to the north (makai) of the bridge and measures 15 m long by 0.71 m high. The terraced wall retains the roadway grade as the adjacent property is at a lower elevation than the roadway itself. It is possible that this feature functioned as a travel path or was also built for soil retention.

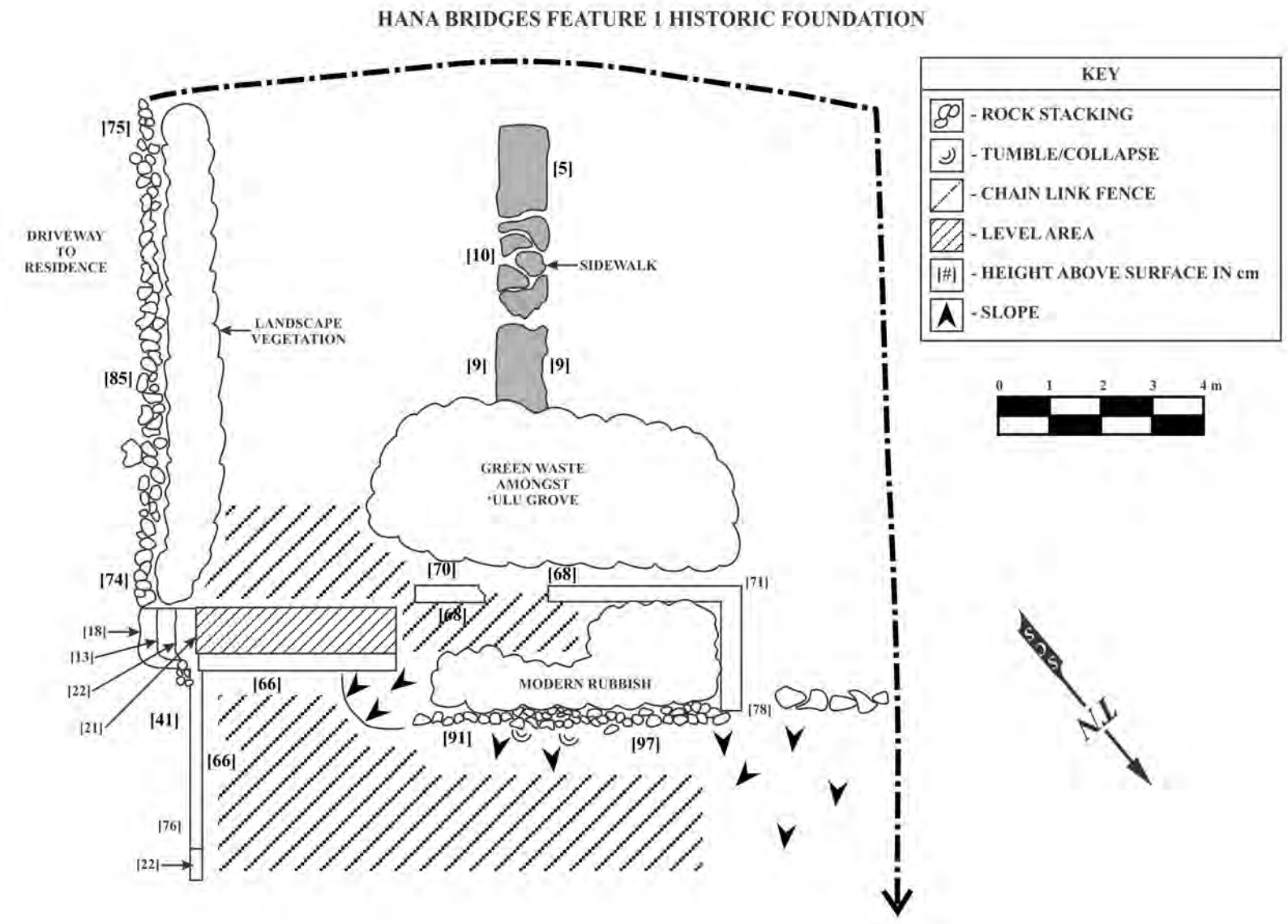


Figure 32: Mokulehua Bridge Planview Map of TS-1.

Figure 33: Photograph of Site TS-1. View to Northwest.

Figure 34: Photograph of Site TS-1. View to West.

Figure 35: Photograph of Mokulehua Bridge Site, Feature 1. View to Northwest.

KOPILI`ULA BRIDGE: SIHP # 50-50-V12-01638

Survey of the Kopili`ula Bridge APE led to the identification of five surface features. All the features were from Historic times, most being associated the old roadway alignment. One feature (Feature 1) is associated with vast network of the East Maui Irrigation (EMI) system. The EMI system has been previously assessed as criterion D and is eligible for the National Register of Historic Places.

Feature 1 consists of an historic road cut into the west wall of Kopili`ula Valley. The feature begins approximately 15 meters from the west approach to Kopili`ula Bridge. The road cut is in fair to good condition as it has been altered by construction work (to maintain the road). The road cut measures 100+ m long by 3 m wide and is based on a north-south orientation. It is surmised that the road cut is associated with the construction of the EMI system. The EMI system, designated as State Site No. 50-50-07-01508, was constructed between 1878-1923 and is composed of over 24 miles of ditches and 50+ miles of tunnels, dams, weirs, culverts, and other infrastructure. This road cut ascends to the top of the valley as likely accessed EMI features in the valley and above the valley.

Feature 2 consists of two accompanying culverts that are located 60 meters east of Kopili`ula Bridge (Figure 36). The feature, associated with water diversion, contains two components: a mauka wall and a makai wall. The walls were constructed of large basalt cobble and have been grouted together. A grouted veneer obscures many of the cobbles on the mauka side. The mauka side varies from 0.50-0.77 m high and 0.45 m wide. The makai side varies between 0.35-0.40 m high and 0.60 m wide. The makai portion measures 4 m long by 2.6 m wide. The mauka portion measures 7 m long to 0.40 m wide. The feature is in fair condition, having been altered by modern mechanical means and bioturbation.

Features 3 through 5 consist of three small boulder alignments located in the potential staging area for work along the Kopili`ula Bridge. These short alignments were likely associated with the original Hāna Road (Figures 37-40). Features 3, 4, and 5 consist of single-course, large cobble alignments measuring less than 2 meters in length. All three are in poor to fair condition, having been mechanically altered in the recent past. These three features may have been kerb stones associated with the prior roadway alignment.

Figure 36: Photograph of Kopili`ula Stream Bridge Site, Feature 2. View to East.

Figure 37: Photograph of Kopili`ula Stream Bridge Site, Feature 3. View to Southwest.

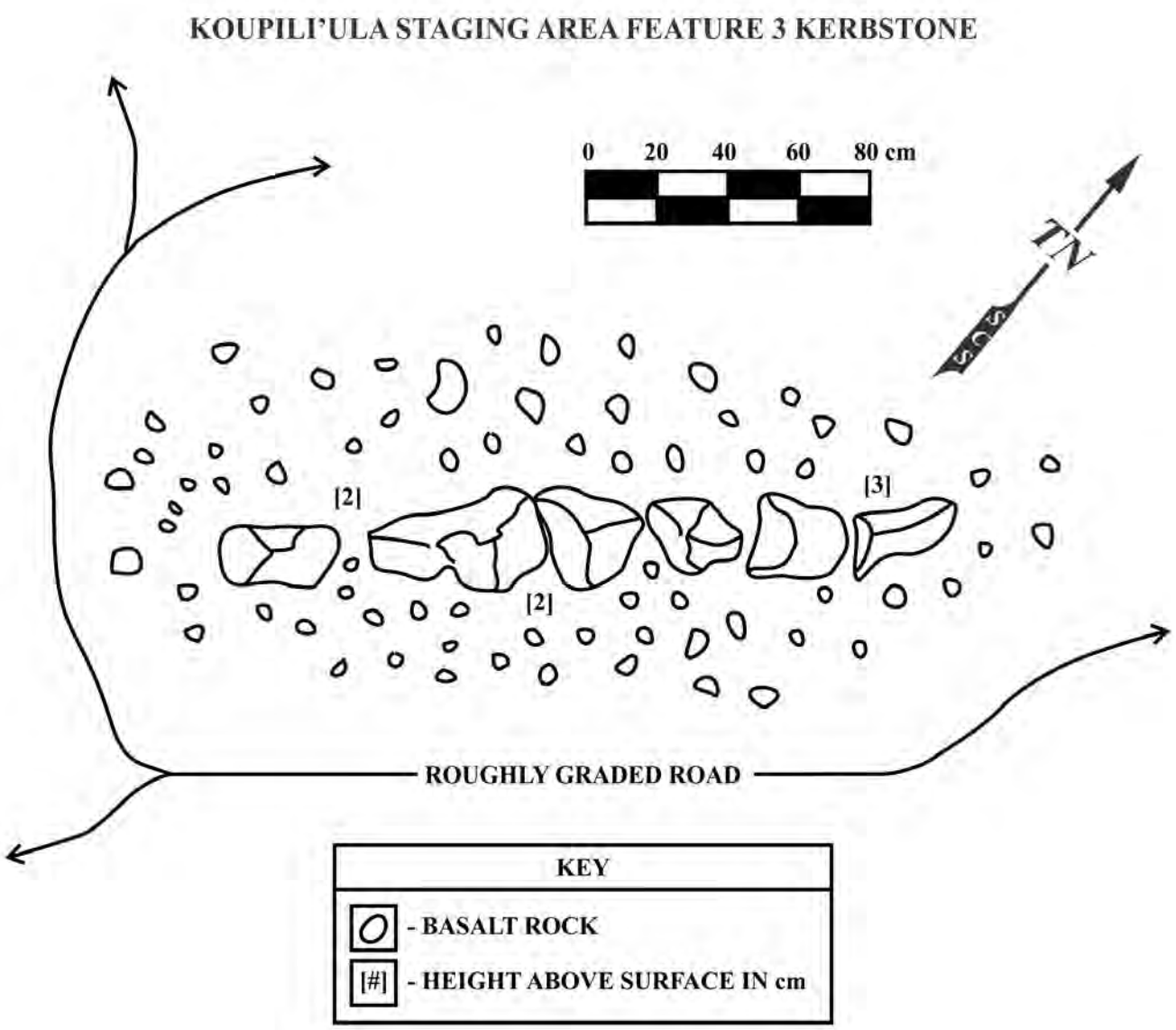


Figure 38: Kopili`ula Bridge Illustration of Feature 3.

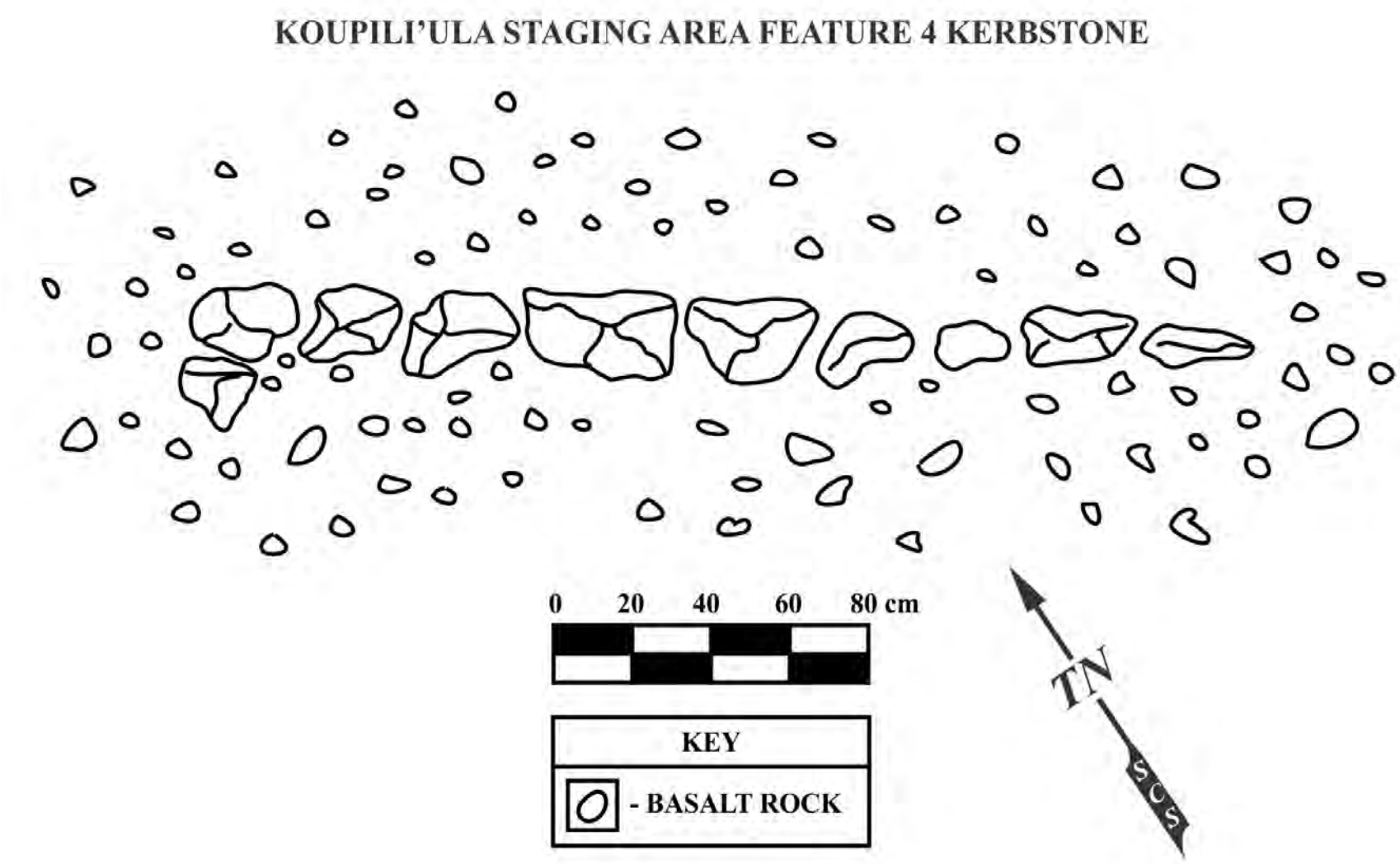


Figure 39: Kopili`ula Bridge Illustration of Feature 4.

Figure 40: Photograph of Kopili`ula Bridge Stream Site, Feature 4. View to Northeast.

PUOHOKAMOA BRIDGE: SIHP # 50-50-07-01509

Survey of the Puohokamoa Bridge APE resulted in the identification of two features: a scenic lookout area with walls and terraces and second, an Historic-era culvert. Both features are older than 50 years old (historic properties) and in fair to good condition.

Feature 1 consists of a series of terrace walls and enclosures which functioned as the scenic lookout for lower Puohokamoa Falls (Figures 41 and 42). It is located above the Puohokamoa Stream Bed. At one point in time, the area was a state wayside park but is currently private property. The feature is constructed of medium to large cobbles, small boulders and concrete grout. The walls create level viewing areas and includes a stairway leading up to the stream bed and associated pool. The overall area of the feature measures 15 m long by 8 m wide (120 m^2) and is oriented on a northeast-southwest axis. The height of the walls averages between 0.29 and 0.46 m above the surface. The walls average 0.46 m thick. The scenic lookout area is maintained and in good condition for the most part.

Feature 2 consists of a historic culvert composed of stacked rock (Figures 43 and 44). Above the culvert is a level, gravel walkway leading to Hāna highway. The feature measures almost 4 m long by 1.5 m wide and has a height above surface to 0.40 m. The feature is in fair condition and functioned as a water diversion structure.

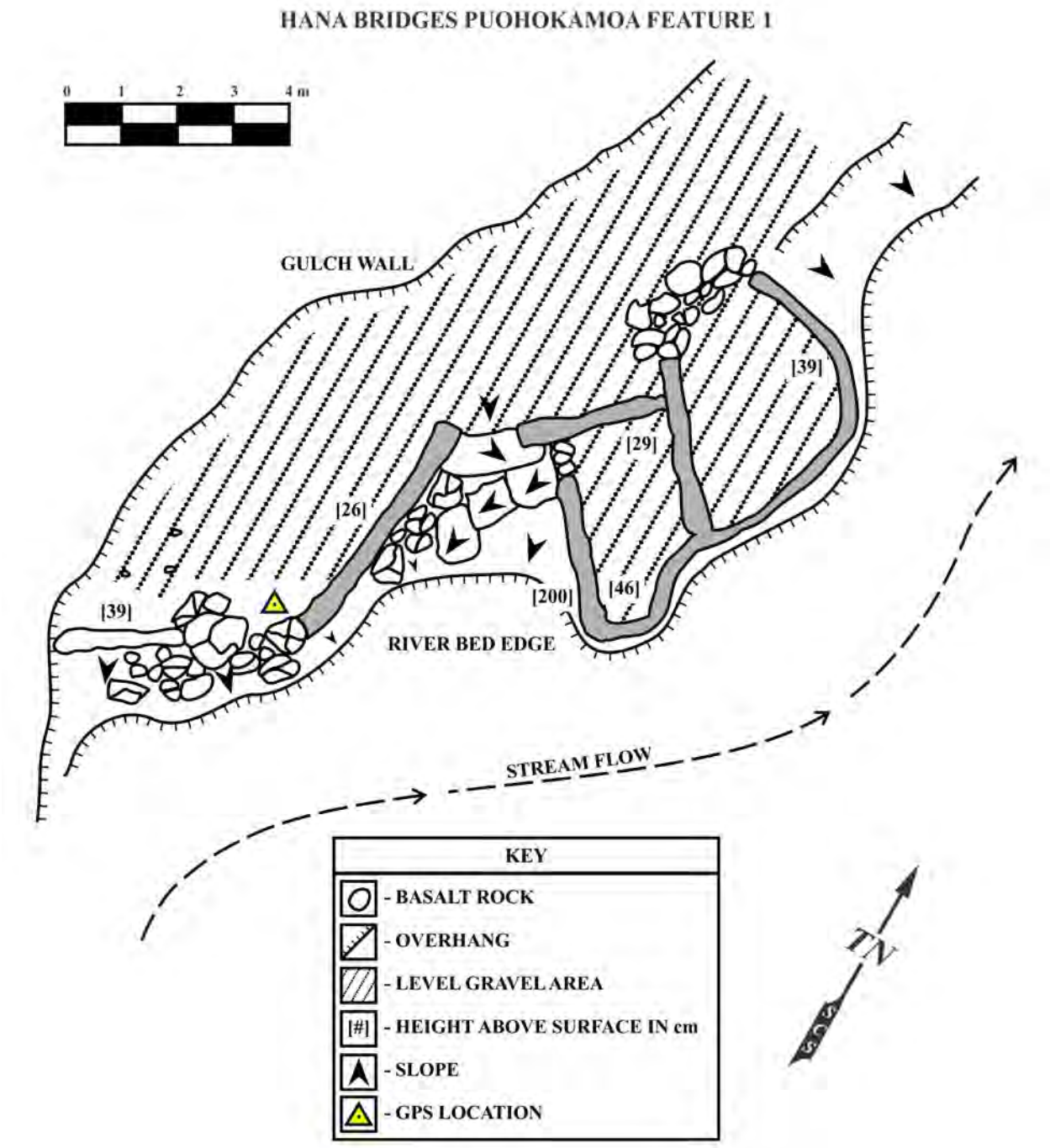


Figure 41: Puohokamoa Bridge illustration, Feature 1.

Figure 42: Photograph of Puohokamoa Bridge Site, Feature 1. View to Northeast.

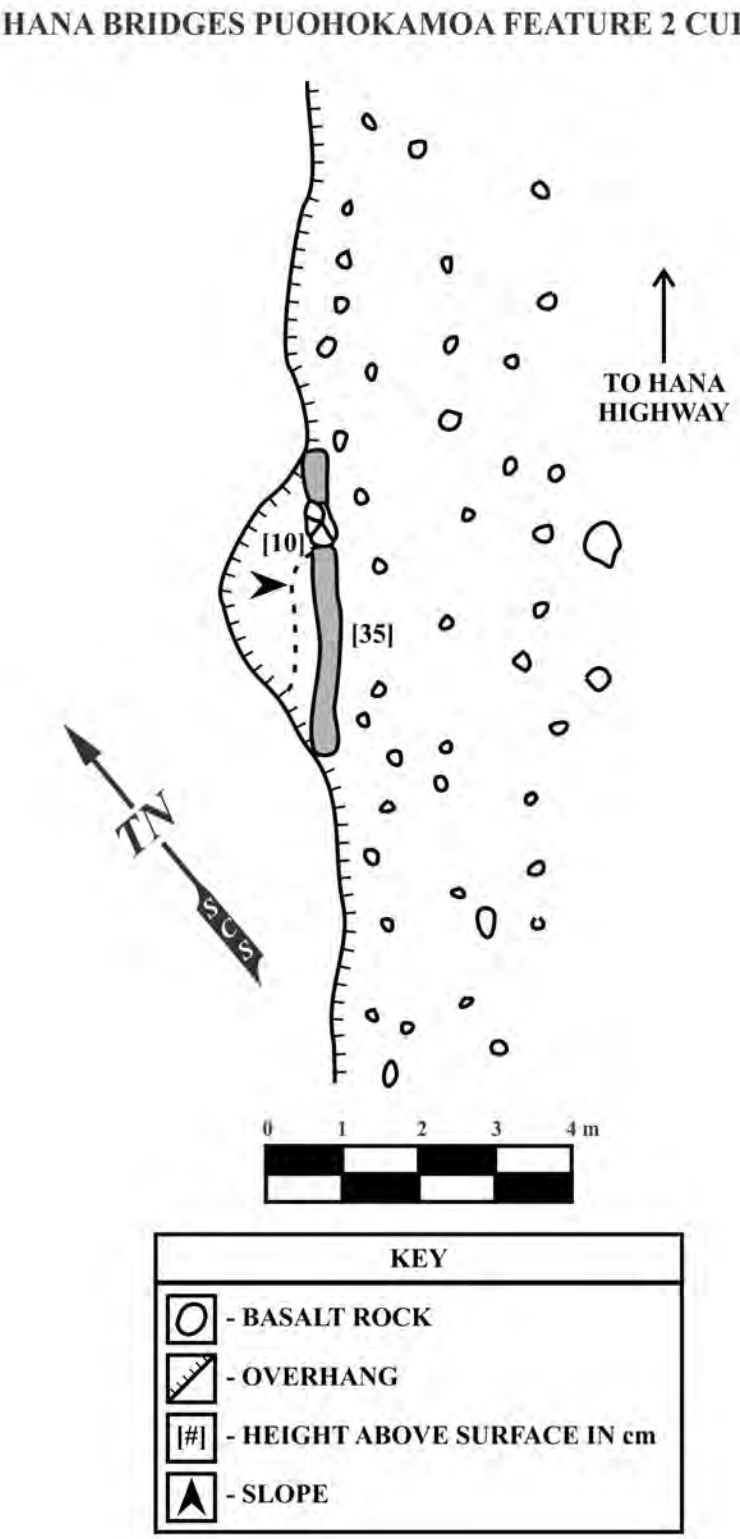


Figure 43: Puohokamoa Bridge Site Illustration, Feature 2.

Figure 44: Photograph of Puohokamoa Bridge Site Illustration, Feature 2. View to East.

SUMMARY AND RECOMMENDATIONS

SCS conducted archaeological inventory survey (AIS) within six defined APE for six historic bridges and a staging area along Hana Highway on Maui Island, Hawai`i. The APE locations are considered potential temporary and permanent impact areas comprised a total 8.8 acres, including the Hāna Highway right-of-way. This AIS included archival and background research and full pedestrian survey within the APE. No subsurface testing occurred at any of the locations.

Fieldwork led to the identification of multiple features at three bridge locations: Mokulehua Stream Bridge (two features), Kopili`ula Stream Bridge (five features), and Puohokamoa Stream Bridge (two features). No features other than the previously identified EMI, the roadway and bridges themselves were recorded in the APE of Kailua, Makanali, or `Ula`ino Stream Bridges. All identified features (9) are Historic-era structures, most being directly associated with the highway. These features consist of a former house foundation, retaining walls and a road cut, culverts, boulder alignments thought to be kerb stones associated with the old road, and a small series of alignments, terraces, and enclosures forming a scenic lookout area. The features are mostly in fair to good condition and are removed from the bridges themselves. Therefore, it is unlikely that they would be impacted by bridge rehabilitation work. No archaeological signatures for pre-Contact or early Historic-era features were identified in APE. All the features but the road cut appear to be directly related in some form to Hana Highway or the old belt road, whether as kerb stones or water diversion features.

SIGNIFICANCE EVALUATIONS AND RECOMMENDATIONS

All previously identified sites have been evaluated for eligibility pursuant to the National Register of Historic Places Evaluation Criteria as outlined in 36 CFR 60. A historic property, to be considered eligible, must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet one or more of the following criteria:

A. The property must be associated with events that have made a significant contribution to the broad patterns of our history.
B. The property must be associated with the lives of persons significant in our past.
C. The property must embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction.
D. The property must show, or may be likely to yield, information important to history or prehistory.

All previously identified sites have also been evaluated for significance under the criteria of HAR §13-275-6. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association, and shall meet one or more of the following criteria:

a. Be associated with events that have made a significant contribution to broad patterns of our history;
b. Be associated with the lives of persons important in our past;
c. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value,;
d. Have yielded, or is likely to yield, information important for research on prehistory or history; or
e. Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due

to associations with traditional beliefs, events or oral accounts – these associations being important to the group's history and cultural identity.

Table 2 summarizes significance assessments and recommendations for NRHP eligibility for sites identified during this present survey. A total of nine features identified during the AIS are associated with three of the bridges within the APE: Mokulehua, Kopili`ula and the Kopili`ula staging area, and Puohokamoa. Features identified during the present survey associated with one or more of the bridges planned for improvements or the EMI system are evaluated as contributing features to the significance of those respective sites or structures and are assessed as retaining sufficient integrity. The one site identified during survey (TS-1) is evaluated as significant under Criterion D for NRHP and Criterion d of HAR §13-275-6 and retains sufficient integrity of location, setting, feeling, and materials under that criterion. As the site does not include extant aboveground buildings or structures, its integrity of workmanship, association, and design are lost.

Table 2: Site Significance Assessments and Eligibility Recommendations

Bridge Name	State Site Number	6E Significance Assessment	NRHP Status/Eligibility Recommendation
Identified during pedestrian survey of Mokulehua Bridge	Temporary State Site 1	Criterion d	Eligible (Criterion D)
Mokulehua Bridge	50-50-13-01638	Criteria a and c	NRHP Listed (Criteria A and C)
Kopili`ula Bridge	50-50-v12-01638	Criteria a and c	NRHP Listed (Criteria A and C)
Puohokamoa Bridge	50-50-07-01509	Criteria a and c	NRHP Listed (Criteria A and C)

EFFECTS RECOMMENDATIONS

The proposed undertaking involves improvements to six bridges in the Hāna Belt Road historic district to address structural and safety deficiencies. All six bridges are contributing elements to the Hāna Belt Road historic district. Proposed improvements to five bridges are replacement of the superstructure with the substructure improved by new micropiles added behind the existing substructure. While this approach retains some features of each bridge, including retaining walls, abutments, and wing walls, replacement of half of the bridge's historic fabric is recommended as an adverse effect. Therefore, it is recommended the

proposed undertaking will have an adverse effect on the Kailua Stream Bridge (SIHP 50-50-06-01638), the Makanali Stream Bridge (SIHP 50-50-07-01638), the Puohokamoa Stream Bridge (SIHP 50-50-07-01509), the `Ula`ino Stream Bridge (SIHP 50-50-13-01638), and the Mokulehua Stream Bridge (SIHP 50-50-13-01638). The Kopili`ula Stream Bridge (SIHP 50-50-12-01638) will be preserved in place with a new bridge constructed makai and is recommended as no adverse effect. Overall effects to the historic district also need to be considered. As designed, it is recommended the proposed undertaking will have no adverse effect on the Hāna Belt Road historic district. The retention of key significant features of each bridge and the use of complementary new design that respects and relates to the historic fabric maintains the consistent stylistic design within the district.

Table 3 lists all historic properties, both previously and presently identified within the APE, and effect recommendations under Section 106 of the NHPA.

Table 3: Effect Recommendations under Section 106 of the NHPA

Historic Property	State Site Number	Significance	Effect Recommendation
Kailua Stream Bridge	50-50-06-01638	A and C	Adverse Effect
Makanali Stream Bridge	50-50-07-01638	A and C	Adverse Effect
Puohokomoa Stream Bridge	50-50-07-01509	A and C	Adverse Effect
`Ula`ino Stream Bridge	50-50-13-01638	A and C	Adverse Effect
Mokulehua Stream Bridge	50-50-13-01638	A and C	Adverse Effect
Kopili`ula Stream Bridge	50-50-12-01638	A and C	No Adverse Effect
Former Residence Foundation	TS-1	D	No Historic Properties Affected
East Maui Irrigation Network	50-50-12-01508	D	No Historic Properties Affected
Hana Belt Road Historic District	50-50-VA-01638	A and C	No Adverse Effect

In summary, the Hāna Highway Bridge Improvement Project effect recommendation for the Section 106 compliance process is “adverse effect.” The effect recommendation for the Chapter 6E review process is “effect, with proposed mitigation commitments.”

RECOMMENDATIONS FOR FURTHER WORK AND MITIGATION

Based on the findings of the current Archaeological Inventory Survey, no further archaeological work is recommended for the proposed undertaking. The project will involve ground disturbance and while testing was not conducted during this study, it is unlikely that significant cultural materials would be identified in this mostly built/previously constructed environment. In conjunction with SHPD, subsurface testing was only to be conducted if pre-Contact sites/features were identified during this study. None were identified and it remains unlikely that significant features or cultural deposits will be identified during this project.

Although no further archaeological work is recommended, the project will likely result in adverse effects on one or more architectural properties, specifically the individual bridges in the Hāna Belt Road historic district. Therefore, these adverse effects will need to be avoided, minimized or mitigated for compliance with Section 106 of the NHPA and HRS Chapter 6E-8. The project is being designed to preserve historic elements and incorporate contextually sensitive and stylistically similar modern elements. Continued consultation with the SHPD for review and approval of proposed designs is recommended. If adverse effects cannot be avoided nor minimized, then development of a Memorandum of Agreement to resolve adverse effects through appropriate mitigation is required. Potential mitigation alternatives may include recordation of adversely affected properties, additional studies or updates to existing studies with new information, public education or interpretation materials for the Hāna Belt Road and associated resources, or development of a standardized process for evaluating future improvements to other historic bridges in the Hāna Belt Road historic district.

REFERENCES CITED

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens
1972 Soil Survey of the Islands of Kaua`i, O`ahu, Maui, Molokai, and Lanai, State of Hawai`i. USDA Soil Conservation Service, GPO, Washington D.C.

Folio, K., Hill, R., Lee-Greig, T.L., and Hammatt, H.H.
2015 An Archaeological Literature Review for the Hana Highway, Route 360, Bridge Preservation Plan within the Hana Highway Historic District, Multiple Ahupuaa, Multiple Districts, Island of Maui, Multiple TMKs (Zone 1: Sections 1-4 and Zone 2: Section 9).

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte
2013 Online Rainfall Atlas of Hawai'i. *Bull. Amer. Meteor. Soc.*, doi: 0.1175/BAMS-D-11-00228.1. Accessed 5 June, 2020.

Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger.
2014 *Evapotransportation of Hawai'i*. Final report submitted to the U.S. Army of Corps of Engineers – Honolulu District, and the Commission on Water Resource Management, State of Hawai'i. Accessed 5 June, 2020.

Google Earth
2013 Aerial photographs of Hawaii. Google Inc., 1600 Amphitheatre Parkway, Mountain View, California. Available at www.google.com/earth.html.

Ige, David
2012 Act 218 (12) Relating to Transportation. Executive Chambers, Honolulu, Hawaii.

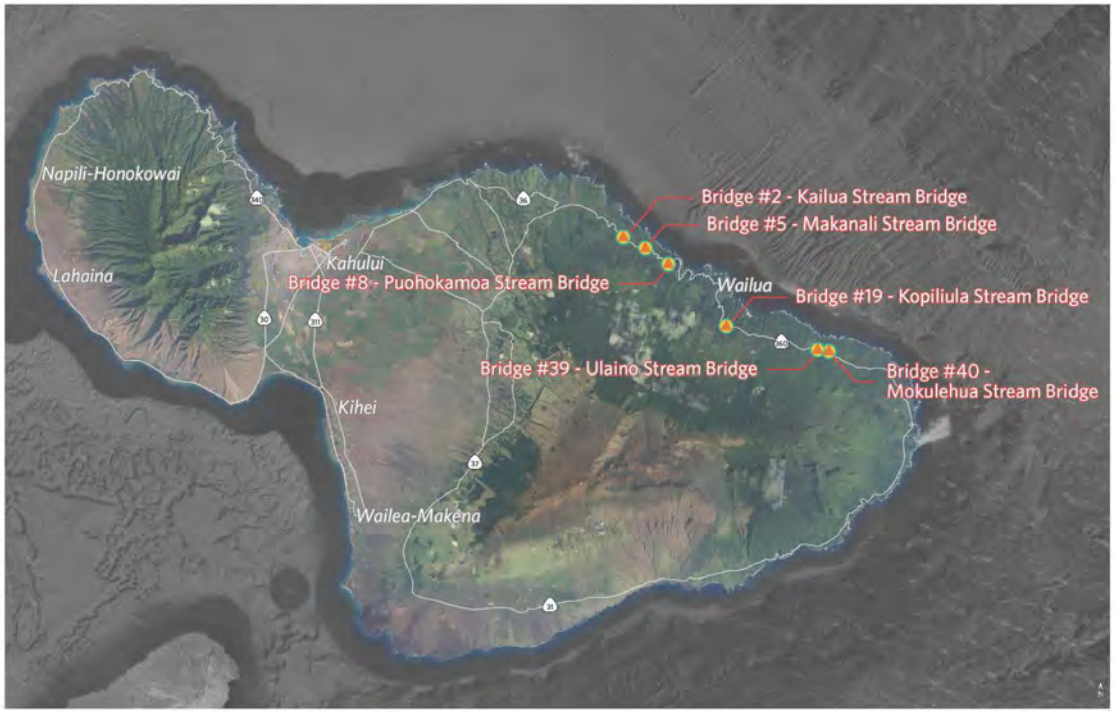
Munsell Soil Color Chart.
2000 Munsell Soil Color Charts (revised). Greta Macbeth, New Windsor, New York.

National Park Service
1983 Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines [As Amended and Annoted]. https://www.nps.gov/history/local-law/arch_stnds_0.htm.

Winterton, N.
2020 Personal Communication by Email with Nicole Winterton, Project Environmental Planner of Winterton Consulting, and Michael Dega, Principal Investigator with SCS.

APPENDIX A: BRIDGE SUMMARIES

Hana Highway Bridge Improvements Project: Bridge Locations



HANA HIGHWAY
BRIDGE IMPROVEMENTS

KAILUA STREAM BRIDGE 02

Photo courtesy of FAI

Bridge Name
Kailua Stream Bridge

Milepost
5.9

Year Built
1929

Maximum Load
10 ton

Bridge Length
40.03 ft.

Span Length
39.04 ft.

Width (curb to curb)
20.34 ft.

Bridge Type:
Concrete Tee Beam

Number of Spans: 1

Rail Type
Concrete Open Vertical

Adjacent TMKs
2-2-9-010-001, 2-2-9-014-001,
2-2-9-012-041, 2-2-9-013-015

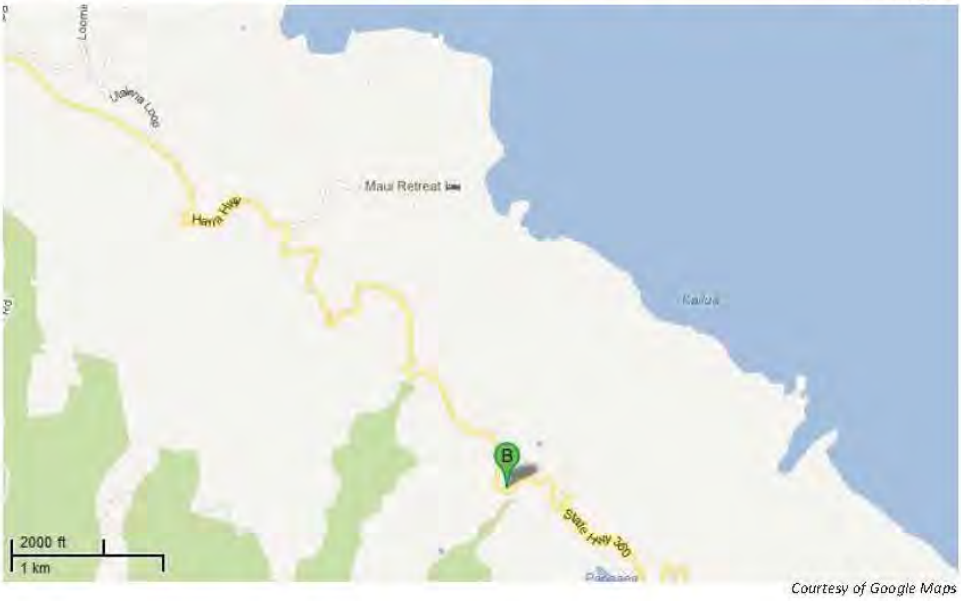
Excerpt from: *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District* (Nov 2015)

Kailua Stream Bridge 02

02 KAILUA STREAM BRIDGE

Bridge Number	009003600500588					**Island**	Maui			
Date of Construction	1929					**Route**	Hana Highway			
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration		Replacement		

Courtesy of FAI



Courtesy of Google Maps

BRIDGE INFORMATION

Location

Latitude	20d 53m 16s
Longitude	156d 12m 49s
Mile Point	5.85
Location	6.26 miles west of Kaumahina State Wayside Park Road
Feature Crossed	Kailua Stream

Bridge Features

Bridge Type	Concrete Tee Beam
Total Length	40.03 feet
Number of Spans	1
Maximum Span	39.0 feet
Deck Width	• Curb-to-Curb = 20.34 feet • Out-to-Out = 21.65 feet
Abutment Material	CRM Abutments
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Concrete Open Vertical
Parapet / Railing Segments	3
Parapet / Railing Height	• Upstream Railing Height = 29 inches • Downstream Railing Height = 38 inches
Baluster Dimensions	• Posts = 6 inches x 6 inches • Posts spaced approx. = 16 inches on-center • End posts = 12 inches x 12 inches
Parapet / Railing Cap Profile	• Rectangular cap • Railing cap = 6 inches x 8 inches

Bridge Features

Kailua Stream Bridge is a single-span reinforced concrete tee beam bridge built in 1929. The superstructure consists of a concrete deck slab with AC pavement overlay supported on four concrete tee beams, which are spaced approximately 6 feet on-center. The substructure consists of CRM abutments and wingwalls. The inspection report mentioned that the Kahului abutment bears directly on natural rock formations. The bearing under the Hana abutment is unknown and covered with vegetation.

Setting of Kailua Stream Bridge
Courtesy of FAI

Kailua Stream Bridge downstream elevation
Courtesy of FAI

Hana approach to Kailua Stream Bridge toward Kahului
Courtesy of NOE!

Kahului approach to Kailua Stream Bridge toward Hana
Courtesy of NOE!

BRIDGE INFORMATION

Concrete open vertical railing, upstream side
Courtesy of NOEI

Concrete open vertical railing, downstream side
Courtesy of NOEI

Downstream CRM wingwall, Hana side
Courtesy of NOEI

Downstream CRM wingwall, Kahului side
Courtesy of NOEI

CRM abutment, Hana side
Courtesy of NOEI

CRM abutment set upon natural rock, Kahului side
Courtesy of NOEI

Significance & Context

Ahupuaa	Puuomaile and Papaaea
Designer / Builder	Unknown
Historic Drawings	None
Alterations	None
Replacement	None
Preservation Priority	Contributing Bridge: Open Picket Railing
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • Exceptional example of CRM abutments on Hana Highway • Exceptional example of CRM wingwalls on Hana Highway • Exemplary example of natural rock formations on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	• Small concrete footing upstream of east abutment may be from an earlier bridge
Geographical Features / Setting	• Adjacent to residence on bluff above • Dry, shallow, rocky streambed with low-slope stream • Low shrubs and trees with grassy hill below house • Dense vegetation
Character Defining Features	• Concrete Tee Beam Bridge • Concrete Open Vertical Railings • CRM Abutments • CRM Wingwalls • Natural Rock Formations • Unusually long non-arched single-span bridge
Detracting Features	• Excessive asphalt

Significance & Context

Bridge Site History

The *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai* (1990) notes, "[t]he present bridge replaced an earlier wooden truss structure built in 1902 as a wagon bridge. The extension of the Hana Highway commenced here in the 1920s. The County set up a convict camp in 1923 in Kailua to house convict laborers paving the road in the direction of Keanae. A similar camp at Keanae housed free laborers working in the opposite direction."[1] Other "[s]imilar replacement projects were conducted at Na'ili'ilihaele, Kea'aiki, Oiliwai [*sic*], Manawaikeae, and Kuhiwa."[2]

The early 20th century was a period that saw significant development of early belt road construction across Hawaii and the creation of an organized Territorial government that could receive and disburse Federal monies for infrastructure developments, including newly paved roads along the present day Road to Hana route. However, initial construction of a road to Hana was severely limited by the challenging topography of the area and sporadic business development for sugar plantations, leading to several stop-start attempts over a couple decades before a continuous road was finally established in the late 1920s.[3]

Initially, a very rough road was established to reach the areas of Nahiku and Keanae. A 1905 report published by the SPW stated that "very rough country is encountered in these districts. On account of the great expenses of road construction, the road has been made as narrow as possible in order to construct, with the money available, the *maximum* [emphasis added] length of road."[4]

At this time, the early DPW began to establish the preferred standard use of concrete for bridge and culvert construction wherever possible, "and where the span was too great so as to make the cost excessive, timber bridges (treated with creosote) have been designed preferably to the steel structures which we have found ... to be the most expensive to maintain and keep in repair."[5]

The Office of County Engineer was established in 1915, with the Maui Board of Supervisors naming Hugh Howell as the inaugural appointee to oversee bridge construction throughout the County of Maui.[6] By 1927, the local newspaper *Maui News* observed that "very few wooden structures are left on Maui... concrete bridges have been put in all over the County,"[7] thus marking the final shift towards replacement of original timber bridges in favor of concrete.

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1 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 63.

2 "Hana Belt Road," Historic American Engineering Record, HAER HI-75 (2005), 30.

3 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 5.

4 Public Works, *Report to the Governor, Territory of Hawaii by the Superintendent of Public Works for the Year Ending June 30, 1905*, Territory of Hawaii (Honolulu: 1905).

5 Ibid.

6 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 5.

7 "Roads and Bridges of County Weather Heavy Rain Storms," Maui News, April 6, 1927.

Archaeological / Cultural Significance

The place name Kailua is defined as, "gulch, Paia area; stream, Haiku area, east Maui... Lit., two seas."[8] The Kailua Stream Bridge spans Kailua Stream, which forms the border between Puuomaile and Papaaea Ahupuaa.[9,10]

The *makai* side of Puuomaile was the scene of the battle between Kamehameha's army from Hawaii Island and that of the Maui chief Kalanikupule. The warrior Kapa-kahili commanded the Maui forces, but he was defeated by Kamehameha. The armies of Kapa-kahili were routed, and when they fled the battle, they were pursued and caught. As the Maui forces attempted to climb Opaepilau Gulch, they were overtaken and killed off by Kamehameha.[11]

According to Kamakau, a tradition of the Papaaea-Keanae region was that this area was the abode of the Hawaiian god of thunder, Kanehekili. Thunder and lightning were very strong in the days before European contact, and worship of the god Kanehekili was encouraged by special *kahuna* who could claim that they were descendants of this god.[12]

Also according to Kamakau, Kiha a Piilani's search for those who would help him in his war against Lono a Piilani included the seeking out of a wise person at Papaaea named Kukui hooleilei, who, in turn, directed Kiha a Piilani to the wise man Kaluko in the uplands of Keanae.[13]

In the early 1870s, the third, and last Catholic mission chapel in the Keanae district was located close to Kailua, about midway between Keanae and Peahi. It was a very small chapel dedicated to St. Augustine. It was built by Father James Beissel. In the course of many years, it has undergone much patching up, but basically it is the same old church, standing alone, close to the road.[14]

Both the Hamakua Ditch Company (precursor of the EMI Company), and the Haiku Sugar Company, managed by Samuel T. Alexander, commenced the construction of a ditch to acquire the water between the Honopou and Nailiilihaele streams. This project to construct the Hamakua Ditch took place in 1876. The digging of the Hamakua Ditch was a work of no small magnitude. A large gang of men, sometimes numbering two hundred, was employed in the work, and the providing of food, shelter, tools, etc., was equal to the care of a regiment of soldiers on the march. All the heavy timbers for flumes, etc., were painfully dragged up hill and down, and in and out of deep gulches, severely taxing the energies and strength of man and beast.[15]

The Halehaku Gulch is 250 feet wide and is crossed by the siphons of the Lowrie Irrigation Canal, which originated in Kailua and was constructed between the Kailua reservoir and Huelo in 1900 by the Spreckelsville Plantation.[16] The water of this canal is tapped at the 457-foot elevation of Kailua Gulch just above a reservoir, after which the water

8 Mary Kawena Pukui, Samuel H. Elbert, and Esther K. Mookini, *Place Names of Hawaii*, rev. and enl. ed. (Honolulu: University Press of Hawaii, 1974).

9 Joseph Iao, "Portion of Hamakualoa & Koolau Maui," registered map no. 2482, Hawaii Territory Survey (1909).

10 U.S. Geological Survey, ed., *Haiku Quadrangle, Hawaii,* 7.5 Minute Series (United States Department of the Interior, 1992).

11 S. M. Kamakau, *Ruling Chiefs of Hawaii*, rev. ed. (Honolulu: The Kamehameha Schools Press, 1992).

12 Samuel Kamakau, *Na Hana a Ka Po'E Kahiko, the Works of the People of Old* (Honolulu: Bishop Museum Press, 1976).

13 S. M. Kamakau, *Ruling Chiefs of Hawaii*, rev. ed. (Honolulu: The Kamehameha Schools Press, 1992).

14 Robert Schoofs, *Pioneers of the Faith: History of the Catholic mission in Hawaii, 1827-1940* (Honolulu: Louis Boeynaems, 1978).

15 Thomas G. Thrum, "Reinforced Concrete Siphon at Kailua," The Hawaiian Planter's Record, ed. C. F. Eckart (Hawaiian Sugar Planter's Association, 1918).

16 Wade W. Thayer, "The Lowrie Irrigation Canal," *Hawaiian Almanac and Annual* (1900-1901), 155-161.

enters an 800-foot-long tunnel. In 1900, Thayer reported that the roadway ceased at Kailua, and that continuing on to Hana was only possible by a trail. A reservoir was built at Papaaea, in the region where Kiha a Piilani began the construction of his *ala loa* [long road].[17]

In 1904, John Wilson and John Duggan became partners and were awarded the contract to begin to build the section of the road between Kailua and Keanae. The original specifications for the road to Hana are not known, but the improvements could not have been much more than a rough horse trail surfaced with stones.[18]

In the early 1920s, County engineer Paul Low divided the construction of the remaining sections of the Hana Belt Road into two: the Kailua to Keanae section, which measured 11.67 miles, and the Keanae to Wailua Iki section, which measured 5.66 miles. Construction from Kailua to Keanae was accomplished between 1923 and 1925. During the early 1920s, when the County of Maui Board of Supervisors were working to reduce construction costs for the Hana Belt road, planning included the use of a workforce of 50 prison laborers, to be housed in a prison labor camp to be constructed at a site east of Kailua. By 1923, the prison labor camp east of Kailua was ready.[19]

Refer to Section G, Appendix 1, Section 3.1.1.4 through Section 3.1.1.7 for the regional background summary of Kailua; Section G, Appendix 1, Section 3.1.4 for the history of the construction of the Hana Belt Road; and to Section G, Appendix 1, Figure 6 for nearby archaeological study areas.[20]

Adjacent Cultural Sites

No documented archaeological sites are located within 200 meters of the Kailua Stream Bridge.

17 Mary Kawena Pukui, Samuel H. Elbert, and Esther K. Mookini, *Place Names of Hawaii*, rev. and enl. ed. (Honolulu: University Press of Hawaii, 1974).

18 Bob Krauss, *Johnny Wilson: First Hawaiian Democrat* (Honolulu: University of Hawaii Press, 1994).

19 Dawn E. Duensing, "The Hana Belt Road: Paving the Way for Tourism," *The Hawaiian Journal of History* 41 (Honolulu: Hawaiian Historic Society, 2007).

20 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

HANA HIGHWAY
BRIDGE IMPROVEMENTS

MAKANALI STREAM BRIDGE 05

Bridge Name
Makanali Stream Bridge

Milepost
8.2

Year Built
1928

Maximum Load
10 ton

Bridge Length
18.04 ft.

Span Length
13.12 ft.

Width (curb to curb)
16.40 ft.

Bridge Type:
Concrete Slab

Number of Spans: 1

Rail Type
Concrete Open Vertical

Adjacent TMKs
2-1-1-001-042, 2-1-1-001-036

Excerpt from: *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District* (Nov 2015)

05 Makanali Stream Bridge

05 MAKANALI STREAM BRIDGE

Bridge Number	009003600500824						**Island**	Maui		
Date of Construction	1928						**Route**	Hana Highway		
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration			Replacement	

Courtesy of Google Maps

Location

Latitude	20d 52m 46s
Longitude	156d 11m 47s
Mile Point	8.22
Location	3.90 miles west of Kaumahina State Wayside Park Road
Feature Crossed	Makanali Gulch

Bridge Features

Bridge Type	Concrete Slab
Total Length	18.04 feet
Number of Spans	1
Maximum Span	13.1 feet
Deck Width	• Curb-to-Curb = 16.40 feet • Out-to-Out = 17.72 feet
Abutment Material	CRM Abutment
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Concrete Open Vertical
Parapet / Railing Segments	1
Parapet / Railing Height	• Upstream Railing Height = 35 inches • Downstream Railing Height = 35 inches
Baluster Dimensions	• Posts = 6 inches x 6 inches • Posts spaced approx. 16 inches on-center • End posts = 12 inches x 12 inches
Parapet / Railing Cap Profile	• Rectangular cap • Railing cap = 6 inches x 8 inches

Bridge Features

Makanali Stream Bridge is a single-span reinforced concrete slab bridge built in 1928. The superstructure consists of a concrete deck slab with AC pavement overlay. The substructure consists of CRM abutments and wingwalls. The abutments bear directly on natural rock formations.

Setting of Makanali Stream Bridge
Courtesy of NOEI

Makanali Stream Bridge downstream elevation
Courtesy of FAI

Hana approach to Makanali Stream Bridge toward Kahului
Courtesy of NOEI

Kahului approach to Makanali Stream Bridge toward Hana
Courtesy of FAI

BRIDGE INFORMATION

Concrete open vertical railing, upstream side
Courtesy of FAI

Concrete open vertical railing, downstream side
Courtesy of FAI

CRM abutment, Hana side
Courtesy of NOEI

CRM abutment, Kahului side
Courtesy of NOEI

Detail of EMI engineering system, tunnel toward Hana side
Courtesy of FAI

Detail of EMI engineering system
Courtesy of FAI

Significance & Context

Ahupuaa	East Makaiwa
Designer / Builder	Unknown
Historic Drawings	None
Alterations	None
Replacement	None
Preservation Priority	Contributing Bridge: Open Picket Railing
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • Good intact example of CRM abutments on Hana Highway • Good intact example of CRM wingwalls on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	• EMI System
Geographical Features / Setting	• Wooded yet open valley area; openness of the area is enhanced by unencumbered vistas towards the hills and horizon • Dense vegetation and groundcover • A visible, wooded pathway marked by a large banyan tree on the Kahului approach side leads to the adjacent EMI System; pathway is hidden behind the adjacent hill topography, making it not visible from the Kahului approach
Character Defining Features	• Concrete Slab Bridge • CRM Abutments • CRM Wingwalls • Concrete Open Vertical Railings
Detracting Features	• Cementitious material obscures the face of CRM abutments

Significance & Context

East Maui Irrigation

Makanali Stream Bridge is one of five historic Hana bridges that is adjacent to the man-made EMI system. The EMI system is a National Historic Civil Engineering Landmark. The EMI System is Hawaii's most dramatic water story. The Old Hamakua Ditch constructed between 1876 and 1878, along with the Reciprocity Treaty between the Kingdom of Hawaii and the United States in 1876, sparked the development of the Hawaiian Sugar industry.

> • *The East Maui Irrigation System demonstrated the feasibility of transporting water from steep tropical forested watersheds, with high rainfall, across difficult terrain to [the] fertile and dry plains [of central Maui]. Sugar production dramatically increased with irrigation and improved cultivation practices.*[1]

The Hamakua Ditch Company (precursor of the EMI Company), and the Haiku Sugar Company, managed by Samuel T. Alexander, commenced the construction of a ditch to acquire the water between the Honopou and Nailiilihaele streams. This project to construct the Hamakua Ditch took place in 1876.

> *The digging of the Hamakua Ditch was a work of no small magnitude. A large gang of men, sometimes numbering two hundred, was employed in the work, and the providing of food, shelter, tools, etc., was equal to the care of a regiment of soldiers on the march. All the heavy timbers for flumes, etc., were painfully dragged up hill and down, and in and out of deep gulches, severely taxing the energies and strength of man and beast.*[2]

The EMI System is the largest privately financed, constructed, and managed irrigation system in the United States.

> • *The construction of the Old Hamakua Ditch sparked major irrigation aqueduct construction on the Hawaiian Islands of Kauai, Oahu, Maui and Hawaii.*
> • *The East Maui Irrigation System was the forerunner of major aqueducts in the Western United States by the Bureau of Reclamation, irrigation districts and regional domestic supplies. Engineer M. M. O'Shaughnessy, in charge of constructing the Koolau Ditch in 1904 and 1905, subsequently built San Francisco Hetch Hetchy water system. Other engineers involved in Hawaii aqueducts subsequently worked in the western states.*[3]
> • *Constructed over a period of 47 years, in several phases, the private irrigation system eventually included 50 miles of tunnels; 24 miles of open ditches, inverted siphons and flumes; and incorporates approximately 400 intakes and 8 reservoirs.*[4]

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1 ASCE Hawaii Section, "East Maui Irrigation System Honored as Historic Civil Engineering Landmark," Hawaii Historic Civil Engineering Landmarks, ASCE Hawaii. http://www.ascehawaii.org/ (accessed 2013-2015).

2 Thomas G. Thrum, "Reinforced Concrete Siphon at Kailua," *The Hawaiian Planter's Record*, ed. C. F. Eckart (Hawaiian Sugar Planter's Association, 1918).

3 ASCE Hawaii Section, "East Maui Irrigation System Honored as Historic Civil Engineering Landmark," Hawaii Historic Civil Engineering Landmarks, ASCE Hawaii, http://www.ascehawaii.org/ (accessed 2013-2015).

4 Ibid.

Archaeological / Cultural Significance

Makanali Stream Bridge spans Makanali Gulch, located in East Makaiwa Ahupuaa within the Koolau District.[5] Native families settled and cultivated gardens in the narrow valleys fed by small streams in this region.[6] No definition for the Hawaiian word *makanali* or any other specific cultural or archaeological background information could be found for this particular location.

Refer to Section G, Appendix 1, Section 3.1.2.8 for a broader regional history of the Koolau District, and to Section G, Appendix 1, Figure 10 for nearby archaeological study areas.[7,8]

Adjacent Cultural Sites

No documented archaeological sites are located within 200 meters of the Makanali Stream Bridge.

Walker Site 81, the Nakeikiikalalomakaiwa Heiau, was listed by Walker as destroyed, but as having once been located in Makaiwa. Refer to Section G, Appendix 1, Table 1: Heiau sites identified by Walker (1931) along the historic portion of Hana Highway.

5 U.S. Geological Survey, ed., *Haiku Quadrangle, Hawaii*, 7.5 Minute Series (United States Department of the Interior, 1992).

6 Davianna Pomaikai McGregor, Ph. D., *Na Kua'aina: Living Hawaiian Culture* (Honolulu: University of Hawaii Press, 2007).

7 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

8 Todd D. McCurdy, Tanya L. Lee-Greig, and Hallett H. Hammatt, "Literature Review and Field Inspection for the Proposed Hana Highway Improvements Huelo to Hāna, Phase II Project, Makaīwa to Ko'olau Ahupua'a, Hāna District, Maui Island TMK: [2] 1-1-001:999; [2] 1-1-002:999; [2] 1-1-007:999; [2] 1-1-008:999; [2] 1-1-009:999 and [2] 1-2-001:999 (pors)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2014).

HANA HIGHWAY
BRIDGE IMPROVEMENTS

PUOHOKAMOA STREAM BRIDGE 08

Bridge Name
Puohokamoa Stream Bridge

Milepost
11.0

Year Built
1912

Maximum Load
10 ton

Bridge Length
56.10 ft.

Span Length
24.93 ft.

Width (curb to curb)
15.09 ft.

Bridge Type:
Concrete Tee Beam

Number of Spans: 2

Rail Type
Soild Reinforced
Concrete Parapet

Adjacent TMKs
2-1-1-001-023, 2-1-1-001-044,
2-1-1-001-022, 2-1-1-001-052

08 Puohokamoa Stream Bridge

08 PUOHOKAMOA STREAM BRIDGE

Bridge Number	009003600501098					**Island**	Maui		
Date of Construction	1912					**Route**	Hana Highway		
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration		Replacement	

Courtesy of Google Maps

BRIDGE INFORMATION

Location

Latitude	20d 52m 02s
Longitude	156d 10m 42s
Mile Point	10.95
Location	1.16 miles west of Kaumahina State Wayside Park Road
Feature Crossed	Puohokamoa Stream

Bridge Features

Bridge Type	Concrete Tee Beam
Total Length	56.10 feet
Number of Spans	2
Maximum Span	20.0 feet
Deck Width	• Curb-to-Curb = 15.09 feet • Out-to-Out = 17.06 feet
Abutment Material	• Concrete Abutments with a CRM base • Concrete Pier Wall with a CRM base
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Solid Reinforced Concrete Parapet
Parapet / Railing Segments	1
Parapet / Railing Height	• Upstream Railing Height = 30 inches • Downstream Railing Height = 32 inches
Parapet / Railing Profile	• Saddle coping cap • Thickness = 7 inches
Parapet Inscription	"A.D. 1912" on downstream face

Bridge Features

Puohokamoa Stream Bridge is a double-span reinforced concrete tee beam bridge built in 1912. The superstructure consists of a concrete deck slab with AC pavement overlay supported on four concrete tee beams in each span. The substructure consists of concrete abutments supported on a CRM base with CRM wingwalls. The center concrete pier wall is supported on a CRM base. The bearings under the abutments and pier are unknown and concealed below grade.

Setting of Puohokamoa Stream Bridge
Courtesy of FAI

Puohokamoa Stream Bridge downstream elevation with inscription
Courtesy of FAI

Hana approach to Puohokamoa Stream Bridge toward Kahului
Courtesy of NOEI

Kahului approach to Puohokamoa Stream Bridge toward Hana
Courtesy of NOEI

Solid concrete parapet with saddle coping, upstream side
Courtesy of NOEI

Solid concrete parapet with saddle coping, downstream side
Courtesy of NOEI

Puohokamoa Stream Bridge downstream elevation with inscription
Courtesy of FAI

Concrete pier wall with CRM base
Courtesy of NOEI

Concrete abutment, Kahului side
Courtesy of NOEI

Concrete abutment, Hana side
Courtesy of NOEI

Significance & Context

Ahupuaa	Kolea and Loiloa
Designer / Builder	Maui Loan Fund Commission - Hugh Howell, Senior Engineer
Historic Drawings	None
Alterations	None
Replacement	None
Preservation Priority	Exceptional Bridge: Distinctive Parapets/Railings
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • One of four solid parapet bridges with a date inscription on Hana Highway, Route 360; the other three similar bridges are Waikamoi Stream, Haipuaena Stream, and Kolea (Punalau Stream) Bridges • Good intact example of concrete abutments on Hana Highway • Good intact example of concrete pier wall on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	• SIHP -1509 located less than 200 meters south-southwest
Geographical Features / Setting	• Adjacent to arboretum • There is an open view of the stream, which is a popular swimming hole; there are several shallow pools and large rocks in the downstream area • There is open but dense groundcover on the downstream hillside, with ti leaf plants • Note: Flash flood and falling rock warnings in this area • Note: This property is located adjacent to private property, leading from the rubble pathway
Character Defining Features	• Concrete Tee Beam Bridge • Concrete Abutments with CRM Base • CRM Wingwalls • Concrete Pier Wall with CRM Base • Concrete Solid Parapets with Cap and Panel Detail • Inset inscription "A.D. 1912" on two panels, downstream parapet
Detracting Features	• Inappropriate parapet repair • Excessive asphalt

Significance & Context

Bridge Site History

In 1911, the Territorial Legislature established the LFC for the disbursement of funds for belt road construction in Hawaii. That same year, a record total of 21 bridges were built on Maui, with four new concrete bridges, including Puohokamoa Stream Bridge, constructed on Hana Highway.[1]

The early 20th century was a period that saw significant development of early belt road construction across Hawaii and the creation of an organized Territorial government that could receive and disburse Federal monies for infrastructure developments, including newly paved roads along the present day Road to Hana route. However, initial construction of a road to Hana was severely limited by the challenging topography of the area and sporadic business development for sugar plantations, leading to several stop-start attempts over a couple decades before a continuous road was finally established in the late 1920s.[2]

Initially, a very rough road was established to reach the areas of Nahiku and Keanae. A 1905 report published by the SPW stated that "very rough country is encountered in these districts. On account of the great expenses of road construction, the road has been made as narrow as possible in order to construct, with the money available, the maximum [emphasis added] length of road."[3]

At this time, the early DPW began to establish the preferred standard use of concrete for bridge and culvert construction wherever possible, "and where the span was too great so as to make the cost excessive, timber bridges (treated with creosote) have been designed preferably to the steel structures which we have found ... to be the most expensive to maintain and keep in repair."[4]

The County Engineer's Office was established in 1915, with the Maui Board of Supervisors naming Hugh Howell as the inaugural appointee to oversee bridge construction throughout the County of Maui.[5] By 1927, the local newspaper *Maui News* observed that "very few wooden structures are left on Maui... concrete bridges have been put in all over the County,"[6] thus marking the final shift towards replacement of original timber bridges in favor of concrete.

1 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 5.

2 Ibid.

3 Public Works, *Report to the Governor. Territory of Hawaii by the Superintendent of Public Works for the Year Ending June 30, 1905*, Territory of Hawaii (Honolulu: 1905).

4 Ibid.

5 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 5.

6 "Roads and Bridges of County Weather Heavy Rain Storms," Maui News, April 6, 1927.

Archaeological / Cultural Significance

The place name *Puohokamoa* is defined as, "the fowl was startled. Stream, Hana, Maui."[7] The bridge spans Puohokamoa Stream, which forms the boundary between Kolea Ahupuaa and Loiloa Ahupuaa.[8] Native families settled and cultivated gardens in the narrow valleys fed by small streams in this region.[9]

Kolea Ahupuaa is one of the boundaries of the Waiakamoi Preserve, which is further bounded by Puukalai-ipu Ahupuaa. It may be possible that Kolea Ahupuaa is named for the endemic plant (*Myrsine sandwicensis*), also known as the *Kolea lau lii*, once found in the mesic and wet forests and shrublands of east Maui. Early Hawaiian uses for the wood of the *Kolea lau lii* tree were for carving the gunwales (the uppermost portions of the hull) for canoes.[10] The tree is also known as a source for red dye for the making of designs on *kapa*, or bark-cloth. In the jungle-forests of the Hana region, these trees can grow to impressive size. *Kolea lau nui* (*Myrsine lessertiana*) is one of nineteen *Myrsine* species endemic to the Hawaiian Islands.[11] According to Kaaiakamanu, the bark, leaves and flowers of the Kolea tree were used medicinally to treat *paaoao* (a childhood disease passed from the parents, such as syphilis and gonorrhea) and *ea* (an infection).[12]

Refer to Section G, Appendix 1, Section 3.2.1 for the regional history of the Koolau District and Kolea Ahupuaa, and to Section G, Appendix 1, Figure 8 for nearby archaeological study areas.[13]

Adjacent Cultural Sites

Puohokamoa Bridge was assigned its own State site number, SIHP -1509, in the Hawaii Register of Historic Places in 1974. However, it is also listed as a feature of SIHP -1638, the Hana Belt Road, on the National Register of Historic Places.[14]

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7 Lorrin Andrews, *A Dictionary of the Hawaiian Language* (Honolulu: The Board of Commissioners of Public Archives of the Territory of Hawaii, 1922).

8 Joseph Iao. "Portion of Hamakualoa & Koolau Maui," registered map no. 2482. Hawaii Territory Survey (1909).

9 Davianna Pomaikai McGregor, Ph. D., *Na Kua'aina: Living Hawaiian Culture* (Honolulu: University of Hawaii Press, 2007).

10 Beatrice H. Krauss, *Plants in Hawaiian Culture* (Honolulu: University of Hawaii Press, 1993).

11 Native Plants Hawaii. "Myrsine lessertiana," University of Hawaii, http://nativeplants.hawaii.edu/plant/view/Myrsine_lessertiana (accessed 2012-2014).

12 Reverend Kalua M. Ka'aiakamanu, *Native Hawaiian Medicine*, vol. 3 (Honolulu: First People's Introduction, 2003).

13 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

14 Hana Belt Road, National Register of Historic Places #20010615 (May 2001).

HANA HIGHWAY
BRIDGE IMPROVEMENTS

KOPILIULA STREAM BRIDGE 19

Photo courtesy of NOEI

Bridge Name
Kopiliula Stream Bridge

Milepost
21.7

Year Built
1926

Maximum Load
10 ton

Bridge Length
77.10 ft.

Span Length
33.14 ft.

Width (curb to curb)
14.44 ft.

Bridge Type:
Concrete Girder

Number of Spans: 2

Rail Type
Concrete Solid

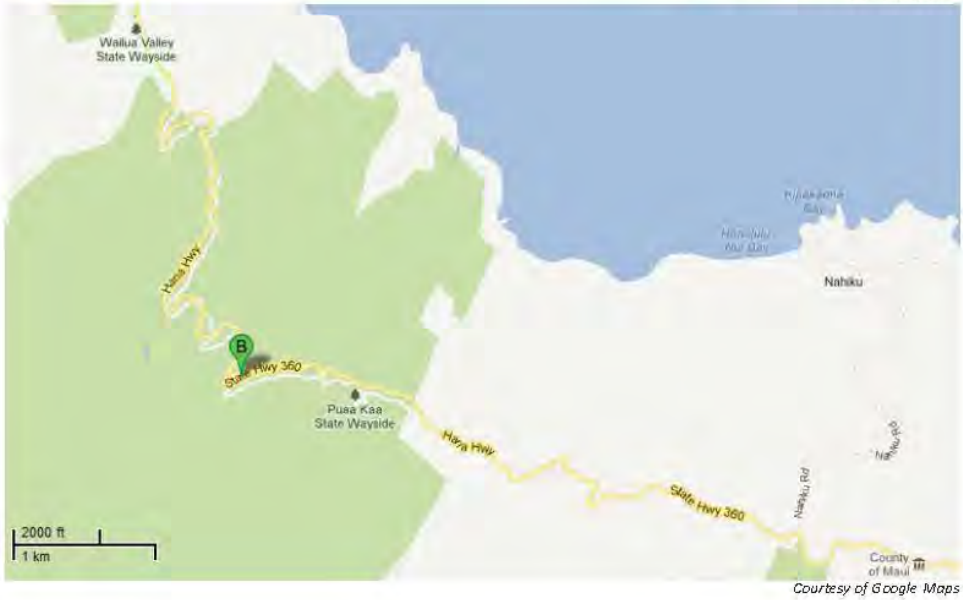
Adjacent TMKs
2-1-2-001-003, 2-1-2-004-005

19 Kopiliula Stream Bridge

19 KOPILIULA STREAM BRIDGE

Bridge Number	009003600502189					**Island**	Maui			
Date of Construction	1926, possibly 1914					**Route**	Hana Highway			
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration		Replacement		

Courtesy of NOEI



Courtesy of Google Maps

Location

Latitude	20d 49m 02s
Longitude	156d 08m 03s
Mile Point	21.73
Location	2.80 miles east of Wailua Valley Lookout
Feature Crossed	Kopiliula Stream

Bridge Features

Bridge Type	Concrete Girder and Floorbeam System
Total Length	77.10 feet
Number of Spans	2
Maximum Span	33.1 feet
Deck Width	• Curb-to-Curb = 13.91 feet • Out-to-Out = 17.72 feet
Abutment Material	• Reinforced Concrete Abutments • Reinforced Concrete Pier Columns
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Concrete Solid
Parapet / Railing Segments	1
Parapet / Railing Height	• Upstream Railing Height = 36 inches • Downstream Railing Height = 36 inches
Parapet / Railing Profile	• Large saddle coping cap • Parapet thickness = 22 inch top with 16 inch base • Parapets are concrete girders
Parapet Inscription	None

Bridge Features

Kopiliula Stream Bridge is a double-span reinforced concrete girder and floorbeam bridge built in 1926 (possibly built in 1914, refer to Section A, Chapter 7. *1912-1916 Road to Nowhere*) . The superstructure consists of a concrete deck slab with AC pavement overlay supported on a reinforced concrete girder and floorbeam system. The concrete through girders also function as the bridge's parapets. The substructure consists of reinforced concrete abutments and pier columns and CRM wingwalls. The abutments and pier bear directly on natural rock formations.

Setting of the Kopiliula Stream Bridge, upstream side
Courtesy of FAI

Setting of the Kopiliula Stream Bridge, downstream side
Courtesy of NOEI

Hana approach to Kopiliula Stream Bridge toward Kahului
Courtesy of NOEI

Kahului approach to Kopiliula Stream Bridge toward Hana
Courtesy of NOEI

Concrete solid parapet, upstream side
Courtesy of NOEI

Concrete solid concrete parapet, downstream side
Courtesy of NOEI

Upstream approach wall, Hana side
Courtesy of NOEI

Concrete girders
Courtesy of NOEI

Upstream CRM wingwall, Hana side
Courtesy of NOEI

Sluice gate beneath the bridge
Courtesy of NOEI

Significance & Context

Ahupuaa	Kaliae and Kekuapawela
Designer / Builder	Maui Loan Fund Commission - Wilson and McCandless Plans approved by William Fawcett Pogue, Vice Chairman
Historic Drawings	Yes (undated)
Alterations	None
Replacement	None
Preservation Priority	Exceptional Bridge: EMI Engineering System
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • Associated with East Maui Irrigation • Only bridge with East Maui Irrigation equipment attached to bridge on Hana Highway, Route 360 • Good intact example of concrete abutments on Hana Highway • Good intact example of concrete pier columns on Hana Highway • Good intact example of CRM wingwalls on Hana Highway • Good intact example of natural rock formations on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	None Documented
Geographical Features / Setting	• Lush vegetation along the hillside • Adjacent to irrigation works - gears are attached to the upstream side of the bridge, with a significant concrete dam system in the upstream area and a low tunnel, slightly hidden amongst the verdant hillside on the Hana side
Character Defining Features	• Concrete Girder and Floor beam System • Reinforced Concrete Pier Columns • CRM Wingwalls • Concrete Solid Parapets with EMI gears attached • EMI irrigation system, dam and sluice gate below

Significance & Context

Bridge Site History

Construction Date Discrepancy: Refer to Section A, Chapter 7, *Design and Construction of Bridges on the Road to Hana*, "1913-1916 Road to Nowhere" for discussion of potential evidence that the bridge was constructed in 1914 by Wilson and McCandless.

East Maui Irrigation

Kopiliula Stream Bridge is one of five historic Hana bridges that is adjacent to the man-made EMI system. The EMI system is a National Historic Civil Engineering Landmark. It is the only bridge with EMI equipment attached (a pulley for the sluice gate). Also, the dam below is integrated into the foundation of the bridge support system.

The East Maui Irrigation System is Hawaii's most dramatic water story. The Old Hamakua Ditch constructed between 1876 and 1878, along with the Reciprocity Treaty between the Kingdom of Hawaii and the United States in 1876, sparked the development of the Hawaiian Sugar industry.

> • *The East Maui Irrigation System demonstrated the feasibility of transporting water from steep tropical forested watersheds, with high rainfall, across difficult terrain to [the] fertile and dry plains [of central Maui]. Sugar production dramatically increased with irrigation and improved cultivation practices.*[1]

The Hamakua Ditch Company (precursor of the EMI Company), and the Haiku Sugar Company, managed by Samuel T. Alexander, commenced the construction of a ditch to acquire the water between the Honopou and Nailiilihaele streams. This project to construct the Hamakua Ditch took place in 1876.

> *The digging of the Hamakua Ditch was a work of no small magnitude. A large gang of men, sometimes numbering two hundred, was employed in the work, and the providing of food, shelter, tools, etc., was equal to the care of a regiment of soldiers on the march. All the heavy timbers for flumes, etc., were painfully dragged up hill and down, and in and out of deep gulches, severely taxing the energies and strength of man and beast.*[2]

The EMI System is the largest privately financed, constructed, and managed irrigation system in the United States.

> • *The construction of the Old Hamakua Ditch sparked major irrigation aqueduct construction on the Hawaiian Islands of Kauai, Oahu, Maui and Hawaii.*
> • *The East Maui Irrigation System was the forerunner of major aqueducts in the Western United States by the Bureau of Reclamation, irrigation districts and regional domestic supplies. Engineer M. M. O'Shaughnessy, in charge of*

1 ASCE Hawaii Section, "East Maui Irrigation System Honored as Historic Civil Engineering Landmark," Hawaii Historic Civil Engineering Landmarks, ASCE Hawaii, http://www.ascehawaii.org/ (accessed 2013-2015).

2 Thomas G. Thrum, "Reinforced Concrete Siphon at Kailua," *The Hawaiian Planter's Record*, ed. C. F. Eckart (Hawaiian Sugar Planter's Association, 1918).

constructing the Koolau Ditch in 1904 and 1905, subsequently built San Francisco Hetch Hetchy water system. Other engineers involved in Hawaii aqueducts subsequently worked in the western states.[3]

• Constructed over a period of 47 years, in several phases, the private irrigation system eventually included 50 miles of tunnels; 24 miles of open ditches, inverted siphons and flumes; and incorporates approximately 400 intakes and 8 reservoirs.[4]

Archaeological / Cultural Significance

The place name *Kopiliula* is defined as, "a red birth gift. Stream, Hana, Maui."[5] The bridge spans Kopiliula Stream, which forms the boundary between Kaliae Ahupuaa and Kekuapawela Ahupuaa.[6, 7]

In 1923, the survey by the county engineer of the Hana belt road from Keanae to Kopiliula was authorized, and bids for construction called for. Paul Low, the County Engineer, and a committee from the Maui Chamber of Commerce asked that more of Maui's prisoners be secured to work on the beltroad project. A. H. Wong, assistant engineer to Paul Low and his eventual successor, also oversaw the completion of the belt road. The amounts allocated to the completion of the belt road were: $50,000 for upgrades to the Hana water system, and $117,500 for the road construction from Kailua to Kopiliula. Earlier, $25,000 had been required to construct the portion of the belt road between Kuiaha and Kakipi Gulch. The Territory made no effort to sell bonds to push the project ahead until 1920. Financing for the belt road construction had become more difficult to justify, and in 1922, the management of the sugar plantation at Kaeleku offered to buy bonds to finish the road.[8]

East Maui Irrigation, Upstream Kahului side
Courtesy of NOEI

East Maui Irrigation upstream side
Courtesy of NOEI

3 ASCE Hawaii Section, "East Maui Irrigation System Honored as Historic Civil Engineering Landmark," Hawaii Historic Civil Engineering Landmarks, ASCE Hawaii, http://www.ascehawaii.org/ (accessed 2013-2015).

4 Ibid.

5 Lorrin Andrews, *A Dictionary of the Hawaiian Language* (Honolulu: The Board of Commissioners of Public Archives of the Territory of Hawaii, 1922).

6 U.S. Geological Survey, ed., *Nahiku Quadrangle, Hawaii*, 7.5 Minute Series (United States Department of the Interior, 1992).

7 W. D. Alexander, "Map of the Koolau Coast Maui: From Wailuanui to Keaa," registered map no. 1066 (1878).

8 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990).

Refer to Section G, Appendix 1, Section 3.1.4 for the history of the construction of the Hana belt road in the vicinity of the Kopiliula Stream Bridge, and to Appendix 1, Figure 10 for nearby archaeological study areas.[9]

Adjacent Cultural Sites

No documented archaeological sites are currently located within 200 meters of the Kopiliula Stream Bridge.

9 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

HANA HIGHWAY
BRIDGE IMPROVEMENTS

ULAINO STREAM BRIDGE 39

Photo courtesy of NOEI

Bridge Name
Ulaino Stream Bridge

Milepost
27.9

Year Built
1914

Maximum Load
10 ton

Bridge Length
39.04 ft.

Span Length
18.04 ft.

Width (curb to curb)
16.40 ft.

Bridge Type:
Concrete Tee Beam

Number of Spans: 2

Rail Type
Concrete Open Vertical

Adjacent TMKs
2-1-2-003-005, 2-1-2-003-001

Excerpt from: *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District* (Nov 2015)

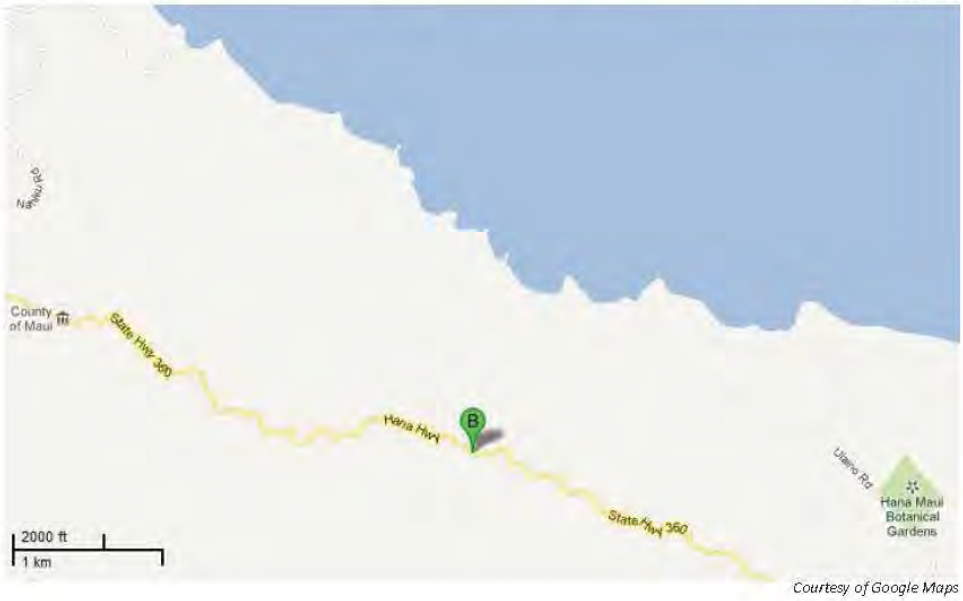
Ulaino Stream Bridge 39

39

ULAINO STREAM BRIDGE

Bridge Number	009003600502801					**Island**	Maui		
Date of Construction	1914					**Route**	Hana Highway		
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration		Replacement	

Courtesy of NOEI



Courtesy of Google Maps

B 39 - 1

BRIDGE INFORMATION

Location

Latitude	20d 47m 52s
Longitude	156d 03m 38s
Mile Point	27.92
Location	2.96 miles east of Lower Nahiku Road
Feature Crossed	Ulaino Stream

Bridge Features

Bridge Type	Concrete Tee Beam
Total Length	39.04 feet
Number of Spans	2
Maximum Span	23.0 feet
Deck Width	• Curb-to-Curb = 16.40 feet • Out-to-Out = 18.04 feet
Abutment Material	• CRM Abutments • Reinforced Concrete Pier Cap and Columns on a Concrete Pier Wall
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Concrete Open Vertical
Parapet / Railing Segments	2
Parapet / Railing Height	• Upstream Railing Height = 38 inches • Downstream Railing Height = 36 inches
Baluster Dimensions	• Posts = 6 inches x 6 inches • Posts spaced approx. 16 inches on-center • Intermediate posts = 12 inches x 10 inches • End posts = 12 inches x 12 inches
Parapet / Railing Profile	• Rectangular Cap • Railing cap = 6 inches x 8 inches

Bridge Features

Ulaino Stream Bridge is a double-span reinforced concrete tee beam bridge built in 1914. The superstructure consists of a concrete deck slab with AC pavement overlay supported on four concrete tee beams in each span, which are spaced approximately 4.5 feet on-center. The substructure consists of CRM abutments, a reinforced concrete pier cap and columns supported on a concrete pier wall, and CRM wingwalls. The abutments and pier bear directly on natural rock formations.

Setting of Ulaino Stream Bridge
Courtesy of FAI

Ulaino Stream Bridge upstream elevation
Courtesy of NOEI

Hana approach to Ulaino Stream Bridge toward Kahului
Courtesy of NOEI

Kahului approach to Ulaino Stream Bridge toward Hana
Courtesy of NOEI

BRIDGE INFORMATION

Concrete open vertical railing, upstream side
Courtesy of NOEI

Concrete open vertical railing, downstream side
Courtesy of NOEI

Concrete pier
Courtesy of NOEI

Upstream CRM wingwall, Hana side
Courtesy of NOEI

CRM abutment set on natural rock, Kahului side
Courtesy of NOEI

CRM abutment set on natural rock, Hana side
Courtesy of NOEI

Significance & Context

Ahupuaa	Ulaino
Designer / Builder	Unknown
Historic Drawings	None
Alterations	None
Replacement	None
Preservation Priority	Contributing Bridge: Open Picket Railing
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • Good intact example of CRM abutments on Hana Highway • Good intact example of pier wall on Hana Highway • Good intact example of natural rock formations on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	None Documented
Geographical Features / Setting	• Spans lava rock stream • Rural residential neighborhood • Open sloping terrain, with views of stream below • Adjacent residence and driveways nearby
Character Defining Features	• Concrete Tee Beam Bridge • CRM Abutments • CRM Wingwalls • Reinforced Concrete Pier Cap and Columns on a Concrete Pier Wall • Concrete Open Vertical Railings
Detracting Features	Non-continuous Hana downstream approach wall

Significance & Context

Bridge Site History

The *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai* (1990) notes, "[t]he 39-foot bridge was built in 1914. The concrete deck and railings are supported by a single concrete pier. The current bridge probably replaced an earlier timber bridge used for an unpaved wagon road to Hana."[1]

> *Howell's communications to the Maui County Board of Supervisors indicated that early wood structures along the Hana Coast were built using truss systems. Howell's program from 1906 to circa 1909 was to replace these failing structures with bridges built on concrete or rock piers, which eliminated the need for high-maintenance trusses. In constructing wood bridges with concrete foundations, Howell was following the advice of SPW C. S. Holloway, who strongly recommended that concrete or wood bridges, rather than steel, be built wherever possible. Holloway further emphasized that particular attention should be paid to the structures' foundations and piers, so that the structures would be of a more permanent nature.*[2]

> *While Wilson was working on his Keanae-Nahiku extension, the MLFC authorized additional bridges for construction. ...In 1913, concrete structures were built in Papahawahawa, and in 1914 at Olowai [sic] and Ula'ino.*[3]

The Office of County Engineer was established in 1915, with the Maui Board of Supervisors naming Hugh Howell as the inaugural appointee to oversee bridge construction throughout Maui County.[4] By 1927, the local newspaper *Maui News* observed that "very few wooden structures are left on Maui... concrete bridges have been put in all over the County,"[5] thus marking the final shift towards replacement of original timber bridges in favor of concrete.

1 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 145.

2 "Hana Belt Road," Historic American Engineering Record, HAER HI-75 (2005), 29.

3 Ibid., 33.

4 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 5.

5 "Roads and Bridges of County Weather Heavy Rain Storms," *Maui News*, April 6, 1927.

Archaeological / Cultural Significance

The place name *Ulaino* is defined as, "Beach, Hana, Maui. Small pebble beach on an otherwise rocky shore. Site of Piilani Heiau, the largest shrine in the Hawaiian Islands. *Lit.*, stormy red."[6] The Ulaino Stream Bridge spans Ulaino Stream, which runs through Ulaino Ahupuaa.[7]

In ancient times, the shoreline along the Nahiku region was covered in a *hala* forest that extended from Ulaino to Hana.[8] The region above Nahiku was traditionally forested with native trees such as *koa, ohia lehua*, sandalwood, and many plants that were used for native medicine also grew there.[9]

In this traditional story of Aikanaka, Hina's children's excrement had to be carried to the north side of the water hole at Ulaino. Hina soon wearied of the task and the *tapu* involved in the disposition of the excrement. To escape this duty, Hina leapt to the moon from a place called Wanaikulani on the night of Hoku (Full moon). As her husband leapt to catch her, Hina's leg broke off in his hand. Thereafter she is called Lonomuku, and she hangs in the moon to this day.[10]

During the battle between the brothers Lono a Piilani and Kiha a Piilani, fighting commenced at:

> *Ulaino, at Makaolehua, and in Akiala at Laahana, at Kawaikau, at Nenewepue, at Kamehaikanas kukui tree and all the way along to Honokalani and Wakiu, into the pandanus grove of Kahalaoweke [Kahalaowaka], down to Pihehe, to the flats of Kalani and the spring of Punahoa.*[11]

Finally, the Hawaii warriors were able to gain the advantage when they invaded Kauiki at night. The army of Umi a Liloa pursued the escaping Hoolae makua across Koolau, where he was caught directly back of Nahiku at a place called Kapipiwai. He was killed. Kiha a Piilani then turned toward Wailuku, where Lono a Piilani ruled Maui. When Lono a Piilani learned of the death of Hoolae makua, he died of fear: that he would be the next one tortured by the forces of Umi a Liloa and Kiha a Piilani.[12]

Refer to Section G, Appendix 1, Section 3.1.3.3.1.4, for the story of Aikanaka; Section 3.1.3.3.1.7, or the story of Kiha a Piilani; Section 3.1.2.8,for the broader regional background of the Nahiku area; and to Section G, Appendix 1, Figure 12 for nearby archaeological study areas.[13]

Adjacent Cultural Sites

No documented archaeological sites are currently located within 200 meters of the Ulaino Stream Bridge.

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6 John R. K. Clark, *Hawai'i Place Names: Shores, Beaches and Surf Sites* (Honolulu: University of Hawaii Press, 2002).

7 U.S. Geological Survey, ed., *Hana Quadrangle, Hawaii*, 7.5 Minute Series (United States Department of the Interior, 1992).

8 Robert Wenkam, *Maui: The Last Hawaiian Place* (San Francisco: Friends of the Earth, 1970).

9 E. S. Craighill Handy, Elizabeth Green Handy, and Mary Kawena Pukui, *Native Planters in Old Hawaii: Their Life, Lore, and Environment*, Bernice P. Bishop Museum Bulletin 233, rev. ed. (Honolulu: Bishop Museum Press, 1991, 1995, 1972).

10 Thomas G. Thrum, *More Hawaiian Folk Tales: A Collection of Native Legends and Traditions* (Chicago: A.C. McClung, 1923).

11 S. M. Kamakau, *Ruling Chiefs of Hawaii*, rev. ed. (Honolulu: The Kamehameha Schools Press, 1992).

12 Ibid.

13 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

HANA HIGHWAY
BRIDGE IMPROVEMENTS

MOKULEHUA STREAM BRIDGE 40

Photo courtesy of FAI

Bridge Name
Mokulehua Stream Bridge

Milepost
28.31

Year Built
1908

Maximum Load
10 ton

Bridge Length
47.90 ft.

Span Length
14.11 ft.

Width (curb to curb)
13.78 ft.

Bridge Type:
Concrete Slab

Number of Spans: 3

Rail Type
Concrete Solid

Adjacent TMKs
2-1-2-003-005, 2-1-2-003-001,
2-1-3-002-023, 2-1-3-002-020

Excerpt from: *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District* (Nov 2015)

Mokulehua Stream Bridge 40

40 MOKULEHUA STREAM BRIDGE

Bridge Number	009003600502835					**Island**	Maui			
Date of Construction	1908					**Route**	Hana Highway			
Treatment Recommendation	X	Preservation	X	Rehabilitation		Restoration		Replacement		

Courtesy of NOEI

Courtesy of Google Maps

BRIDGE INFORMATION

Location

Latitude	20d 47m 47s
Longitude	156d 03m 25s
Mile Point	28.25
Location	3.06 miles west of Alalele Place (road to Hana Airport)
Feature Crossed	Mokulehua Gulch

Bridge Features

Bridge Type	Concrete Slab
Total Length	47.90 feet
Number of Spans	3
Maximum Span	14.1 feet
Deck Width	• Curb-to-Curb = 13.78 feet • Out-to-Out = 15.10 feet
Abutment Material	• CRM Abutments • Concrete Pier Walls with rounded cutwater profile
Wingwall Material	CRM Wingwalls
Floor / Decking Material	Concrete Deck with AC Overlay
Parapet / Railing Type	Concrete Solid
Parapet / Railing Segments	1
Parapet / Railing Height	• Upstream Railing Height = 35 inches • Downstream Railing Height = 35 inches
Parapet / Railing Profile	• Parapet Thickness = ±8 inches
Parapet Inscription	None

Bridge Features

Mokulehua Stream Bridge is a triple-span reinforced concrete slab bridge built in 1908. The superstructure consists of a concrete deck slab with AC pavement overlay. The substructure consists of CRM abutments, two concrete pier walls, and CRM wingwalls. The abutments and piers bear directly on natural rock formations.

Setting of Mokulehua Stream Bridge
Courtesy of NOEI

Mokulehua Stream Bridge upstream elevation
Courtesy of NOEI

Hana approach to Mokulehua Stream Bridge toward Kahului
Courtesy of NOEI

Kahului approach Mokulehua Stream Bridge toward Hana
Courtesy of NOEI

Concrete open vertical railing, upstream side
Courtesy of NOEI

Concrete open vertical railing, downstream side
Courtesy of NOEI

Concrete piers with rounded cutwater profile
Courtesy of NOEI

Mokulehua Stream Bridge piers downstream elevation
Courtesy of NOEI

CRM abutment set on natural rock, Kahului side
Courtesy of NOEI

CRM abutment set on natural rock and CRM wingwall, Hana side
Courtesy of NOEI

Significance & Context

Ahupuaa	Ulaino and Makapuu
Designer / Builder	Unknown
Historic Drawings	None
Alterations	None
Replacement	None
Preservation Priority	Exceptional Bridge: Oldest Concrete Bridge on Maui
State / National Register	Yes
Areas of Significance	Engineering, Social History, Transportation, Commerce
Significance Statement	• Contributes to the Hana Highway Historic Bridge District • Part of best remaining intact example of a belt road system in the state • 20th century example of bridge engineering and construction • See National Register of Places Nomination Form in appendices • HAER Recordation: HI-75 (2005) • Oldest bridge on Hana Belt Road according to DOT records (1908) • Good intact example of CRM abutments on Hana Highway • Good intact example of CRM wingwalls on Hana Highway • Good intact examples of solid concrete pier walls on Hana Highway • Good intact example of natural rock formations on Hana Highway
Archaeological / Cultural Significance	• Greater than 50 years in age • Part of the Hana Belt Road, which retains a high level of historic integrity and character, and which includes the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaii • Relatively unaltered in terms of historic setting and character, including location, width, alignment, scenery, and vistas
Adjacent Cultural Sites	None Documented
Geographical Features / Setting	• Rural residential • Waterfall below bridge • Open, wide terraced stream
Character Defining Features	• Concrete Slab Bridge • CRM Abutments • CRM Wingwalls • Concrete Pier Walls with rounded cutwater profile • Concrete Solid Parapets
Detracting Features	• Damaged parapet ends with exposed rebar • Damaged approach wall corners • Overgrown flora/fauna on bridge

Significance & Context

Bridge Site History

This is the first reinforced concrete bridge built on the Hana Highway. It replaced a wooden bridge and was constructed on top of the older bridge piers.[1] The *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai* (1990) notes, "[t]he Mokulehua Bridge is the oldest bridge on Maui and the third oldest in the state, after Mamalahoa Highway bridge (1904) in Hawaii and the Waipahu Street bridge (1905) on Oahu."[2]

Archaeological / Cultural Significance

The Hawaiian phrase *moku lehua* translates as, "Solemn feast after the cutting (moku) of an *ohia* log for a temple image; cluster of lehua trees."[3] The Mokulehua Stream Bridge spans Mokulehua Gulch, which forms the boundary between Ulaino Ahupuaa and Makapuu Ahupuaa.[4]

The Hana region was under the jurisdiction of the Maui King Kamehamehanui in the mid-1700s. Around the year A.D. 1759, Kalaniopuu gathered an army at Kohala on the island of Hawaii and invaded Hana, taking the fort at Kauiki Hill overlooking the harbor of Hana, as well as the district of Kipahulu. But Kamehamehanui, although taken by surprise, soon made careful plans to retake his lost territory. Several battles were fought at Hana in which the Maui forces prevailed, primarily at Makaolehua [Mokulehua] and Akiala. However, the fortress at Kauiki withstood all attempts to retake it, and after a prolonged siege, Kamehamehanui withdrew his forces and left Hana in possession of Kalaniopuu.[5]

Refer to Section G, Appendix 1, Section 3.1.3.3.1.5, for the story of Kamehamehanui, and to Section G, Appendix 1, Figure 12 for nearby archaeological study areas.[6]

Adjacent Cultural Sites

No documented archaeological sites are currently located within 200 meters of the Mokulehua Stream Bridge.

1 Hawaii Heritage Center, *Historic Bridge Inventory and Evaluation, Islands of Maui and Molokai*, prepared for the State of Hawaii Department of Transportation Highways Division (September 1990), 191.

2 Ibid.

3 Mary Kawena Pukui and Samuel H. Elbert, *Hawaiian Dictionary: Hawaiian-English, English-Hawaiian*, rev. and enl. ed. (Honolulu: University of Hawaii Press, 1986).

4 Hugh Howell, "Map of the Nahiku Coffee Lands: Being a Subdivision of a Portion of the Districts of Koolau and Hana Maui, H.I.," registered map no. 2649 (1897).

5 Abraham Fornander, *An Account of the Polynesian Race, its Origin and Migrations, Vol. II* (London: Trubner & Co. Ludgate Hill, 1880).

6 Sallie D. M. Freeman, Holly J. Formolo, and Hallett H. Hammatt, "An Archaeological Monitoring Report for Hāna Highway Improvements Huelo to Hāna, M.P. 4.20 to 23.70 Districts of Makawao (Hāmākualoa and Ko'olau) and Hana, Island of Maui (TMK: 2-1-1; 2-1-2; 2-1-3; 2-1-4; 01-05; and 2-2-9:05, 06, 09, 10, 12, 13)," Cultural Surveys Hawai'i, Inc. (Wailuku: 2004).

Appendix C.

Cultural Impact Assessment

SCS PROJECT NO. 2295-Final CIA

A CULTURAL IMPACT ASSESSMENT REPORT FOR THE HĀNA HIGHWAY BRIDGES IMPROVEMENT PROJECT PU‘UOMĀILE AND PĀPA‘A‘EA, EAST MAKAĪWA, KŌLEA, LOILOA, KALIAE, KEKUAPAWELA, ‘ULA‘INO, AND MAKAPU‘U AHUPUA‘A MAKAWAO AND HĀNA DISTRICTS ISLAND OF MAUI, HAWAI‘I

TMK: (2) 1-1-001:022 por., 023 por., 036 por., 042 por., 044 por., and 052 por.
(2) 1-2-001:003 por.; (2) 1-2-004:005 por., (2) 1-2-003:001 por. and 005 por.
(2) 1-3-002:020 por. and 023 por., (2) 2-9-010:001 por., (2) 2-9-014:001 por.
(2) 2-9-012:041 por., (2) 2-9-013:015 por., and Hāna Highway Right-of-Way por.

Prepared by:
Cathleen A. Dagher, B.A.
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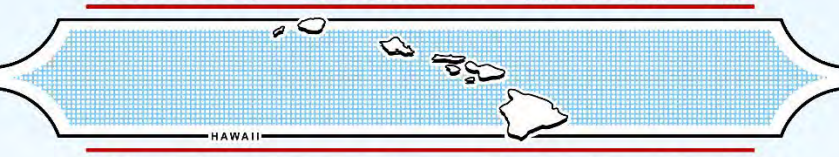
FINAL

Prepared for:
U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380A
Lakewood, CO 80228-2583

SCIENTIFIC CONSULTANT SERVICES Inc.



1357 Kapiolani Blvd., Suite 850 Honolulu, Hawai‘i 96814

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INTRODUCTION

At the request of the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), Scientific Consultant Services, Inc. (SCS) has prepared a Cultural Impact Assessment (CIA) in advance of the proposed improvements to six historic bridges along Hāna Highway (Hāna Belt Road, Route 360) on the Island of Maui. The Hāna Belt Road is listed in the National Register of Historic Places (National Register Reference # 01000615 and SIHP # 50-50-va-01638) under Criteria a and c.

The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliʻula Stream Bridge (MP 21.7) and staging area, ʻUlaʻino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3). The project area encompasses the ahupuaʻa of Puʻuomāile, Pāpaʻaea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu, located in the Districts of Makawao (Hāmākualoa) and Hāna (Koʻolau and Hāna), Island of Maui, Hawaiʻi [TMK: (2) 1-1-001:022 por., 023 por., 036 por., 042 por., 044 por., and 052 por., (2) 1-2-001:003 por., (2) 1-2-004:005 por., (2) 1-2-003:001 and 005 por., (2) 1-3-002:020 por. and 023 por., (2])2-9-010:001 por., (2) 2-9-014:001 por., (2) 2-9-012:041 por., (2]) 2-9-013:015 por., and the Hāna Highway Right-of-Way por.].

The Hawaii State Office of Environmental Quality Control (OEQC 2012:11) states that "an environmental assessment of cultural impacts" gathers information about cultural practices and cultural features that may be affected by significant environmental effects:

> Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

The purpose of a CIA is to identify the possibility of on-going cultural activities and resources within a project area, or its vicinity, and then assess the potential for impacts on these cultural resources. The CIA is not intended to be a document of in depth archival-historical land research, or a record of oral family histories, unless these records contain information about specific cultural resources that might be impacted by a proposed project.

CULTURAL IMPACT ASSESSMENT METHODOLOGY

OEQC GUIDELINES FOR ASSESSING CULTURAL IMPACTS

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 2012:12):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, which support such cultural beliefs.

The meaning of "traditional" was explained by in National Register Bulletin 38:

> "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations,' usually orally or through practice. The traditional cultural significance of a historic property then is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. . . [Parker and King 1998:1]

This CIA was prepared as much as possible in accordance with the suggested methodology and content protocol in the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). In outlining the "Cultural Impact Assessment Methodology," the OEQC (2012:11) states that:

> information may be obtained through scoping community meetings, ethnographic interviews and oral histories…

This Cultural Impact Assessment was prepared in accordance with the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). The Guidelines recommend that preparers of assessments analyzing cultural impacts adopt the following protocol:

- Identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua'a;
- Identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
- Receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
- Conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;

- Identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and

- Assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

CULTURAL IMPACT ASSESSMENT CONTENTS

The OEQC Guidelines state that an assessment of cultural impacts should address, but not be limited to the following:

- Discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.

- Description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.

- Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.

- Biographical information concerning the individuals and organizations consulted their particular expertise and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.

- Discussion concerning historical and cultural source materials consulted, the institutions and repositories searched and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.

- Discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

- Discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area affected directly or indirectly by the proposed project.

- Explanation of confidential information that has been withheld from public disclosure in the assessment.

- Discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.

- Analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

- A bibliography of references and attached records of interviews which were allowed to be disclosed.

If on-going cultural activities and/or resources are identified within the project area, assessments of the potential effects on the cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

GEOGRAPHICAL EXTENT

As defined by the Hawaii State Office of Environmental Quality Control (OEQC 2012:11), the geographical extent should be greater than the area over which the proposed project will take place in order to ensure that cultural practices that occur outside of the project area, but which may still be affected, are included in the assessment. For example, a project that may not itself physically impact traditional gathering practices but may block access to those locations would be included within the assessment. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or ahupua‘a." In some cases, the geographical extent could extend beyond the ahupua‘a if cultural practices do so as well.

PROJECT METHODOLOGY

This report contains archival and documentary research, as well as communication with organizations and individuals having knowledge of the project area, its cultural resources, and its practices and beliefs. An example of the initial letter of inquiry is presented in Appendix A, copies of the posted newspaper notice and affidavit are presented in Appendix B, and an example of the follow up letter is presented in Appendix C. This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 2012:13), whenever possible. The assessment concerning cultural impacts may include, but not be limited to the following items discussed below.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps, land records, such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological reports.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of this report. Such scholars as Samuel Kamakau, Martha Beckwith, Jon J. Chinen, Lilikalā Kameʻeleihiwa, R. S. Kuykendall, Marion Kelly, E. S. C. Handy and E.G. Handy, John Papa ʻĪʻī, Gavin Daws, A. Grove Day, and Elspeth P. Sterling, and Mary Kawena Pukuʻi and Samuel H. Elbert continue to contribute to our knowledge and understanding of Hawaiʻi, past and present.

The works of these and other authors were consulted and incorporated in this report where appropriate. Historic land use document research was supplied by the Waihona ʻAina (2021) Database, the Office of Hawaiian Affairs Kipuka Database (2021), and the County of Maui County Real Property Assessment Division Database (2019).

INTERVIEWS

In general, interviews are conducted in accordance with Federal and State laws and guidelines when knowledgeable individuals are able to identify traditional cultural practices and/or resources procured in the project area or in the environs. If they have knowledge of traditional stories, practices and beliefs, and resources associated with a project area or if they know of historical properties within the project area, they are sought out for additional consultation and interviews. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information concerning particular cultural resources. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs (OHA), historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input and suggest further avenues of inquiry, as well as specific individuals to interview. It should be stressed again that this process does not include formal or in-depth ethnographic interviews or oral histories as described in the OEQC's Guidelines for Assessing Cultural Impacts (2012). The assessments are intended to identify potential impacts to ongoing cultural practices, or resources, within a project area or in its close vicinity.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then summarized. These draft summaries are returned to each of the participants for their review and comments. After corrections are made, each individual is to sign an information release form, making the interview available for this study. When telephone interviews occur, a summary of the information is also sent for correction and approval or dictated by the informant and then incorporated into the document. If no cultural resource information is forthcoming and no knowledgeable informants are suggested for further inquiry, interviews are not conducted.

KA PA‘A KAI O KA‘AINA V. LAND USE COMM’N, STATE OF HAWAI‘I

The Land Use Commission (LUC) is also required to apply the analytical framework set forth by the Hawaii Supreme Court in Ka Pa‘akai O Ka‘Aina v. Land Use Comm’n, State of Hawai‘i, 94 Hawai‘i 31, 7 P.3d 1068 (2000) (hereinafter, “Ka Pa‘akai”). In this case, a coalition of native Hawaiian community organizations challenged an administrative decision by the Land Use Commission (the “LUC”) to reclassify nearly 1,010 acres of land from conservation to urban use, to allow for the development of a luxury project including upscale homes, a golf course, and other amenities. The native Hawaiian community organizations appealed, arguing that their native Hawaiian members would be adversely affected by the LUC’s decision because the proposed development would infringe upon the exercise of their traditional and customary rights. Noting that “[a]rticle XII, section 7 of the Hawaii Constitution obligates the LUC to protect the reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible when granting a petition for reclassification of district boundaries,” the Hawai‘i Supreme Court held that the LUC did not provide a sufficient basis to determine “whether [the agency] fulfilled its obligation to preserve and protect customary and traditional rights of native Hawaiians” and, therefore, the LUC “failed to satisfy its statutory and constitutional obligations.” Ka Pa‘akai, 94 Hawai‘i at 46, 53, 7 P.3d at 1083, 1090.

The Hawai‘i Supreme Court in Ka Pa‘akai provided an analytical framework in an effort to effectuate the State’s obligation to protect native Hawaiian customary and traditional practices while reasonably accommodating competing private interests. In order to fulfill its duty to preserve and protect customary and traditional native Hawaiian rights to the extent feasible, the LUC must—at a minimum—make specific findings and conclusions as to the following:

A. the identity and scope of “valued cultural, historical, or natural resources” in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area;

B. the extent to which those resources--including traditional and customary native Hawaiian rights--will be affected or impaired by the proposed action; and

C. the feasible action, if any, to be taken by the LUC to reasonably protect native Hawaiian rights if they are found to exist.

See Ka Pa‘akai, 94 Hawai‘i at 47, 7 P.3d at 1084.

To fulfill these purposes outlined by Ka Pa‘akai, the Cultural Impact Assessment has reviewed historical research and suggestions from contacts knowledgeable about traditional cultural practices which were conducted within the project area corridor and in the surrounding environs. The potential effect of the proposed project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place has been analyzed.

ENVIRONMENTAL SETTING

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. The Island was formed by two volcanoes, Puʻu Kukui in the west and Haleakalā in the east. These are joined together by an isthmus containing dry, open country or kula. Reaching 5,787 feet (1,764 meters) above mean sea level (amsl). Puʻu Kukui is the highest peak of the west Maui Mountains (Mauna Kahalawai). Puʻu Kukui forms the west end of the island and is composed of large, heavily eroded amphitheater valleys that contain well-developed permanent stream systems that watered fertile agricultural lands extending to the coast. The deep valleys of West Maui and their associated coastal regions have been witness to many battles in ancient times and were coveted productive landscapes.

The younger of the two volcanoes, Haleakalā, soars 10,023 feet (3,055 meters) amsl. and embodies the largest section of the island. Unlike the amphitheater valleys of West Maui, the flanks of Haleakalā are distinguished by gentle slopes. Although it receives more rain than its counterpart in the east, the permeable lavas of the Honomanū and Kula Volcanic Series prevent the formation of rain-fed perennial streams. The few perennial streams found on the windward side of Haleakalā originate from springs located at low elevations. Valleys and gulches were formed by intermittent water run-off.

PROJECT AREA

The APE for this project contains seven separate locations (six bridges and a staging area), with the distance between the furthest bridges being 22.4 miles (Kailua Stream Bridge at MP 5.9 to Mokulehua Stream Bridge at MP 28.3). The APE is located along the northern portion of East Maui and encompasses the distinct ahupuaʻa of Puʻuomāile, and Pāpaʻaea in the traditional District of Hāmākualoa, now Makawao District; East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, located in the traditional District of Koʻolau (now Hāna District), and Makapuʻu located in the traditional and modern District of Hāna, on the Island of Maui, Hawaiʻi (Figures 1 through 4). As such, there are micro-environments and climates, each area associated withs its own unique place in Maui history and its own set of legends, along this 22-mile stretch. Thus, for the purposes of this report, the bridge locations will be discussed by traditional district and the ahupuaʻa within each district.

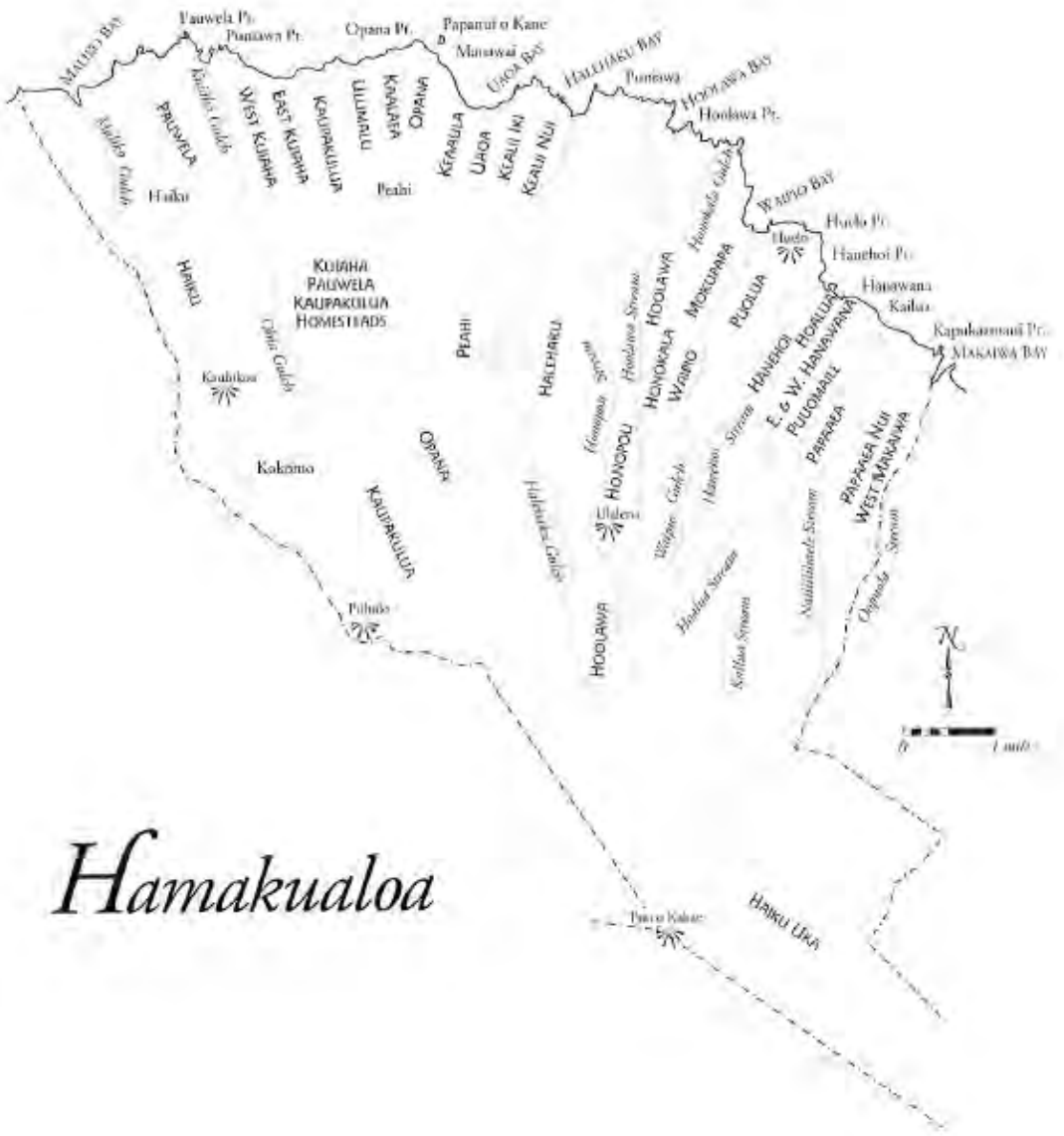


Figure 1: Map of the Traditional District of Hāmākualoa (From Sterling 1998: 100).

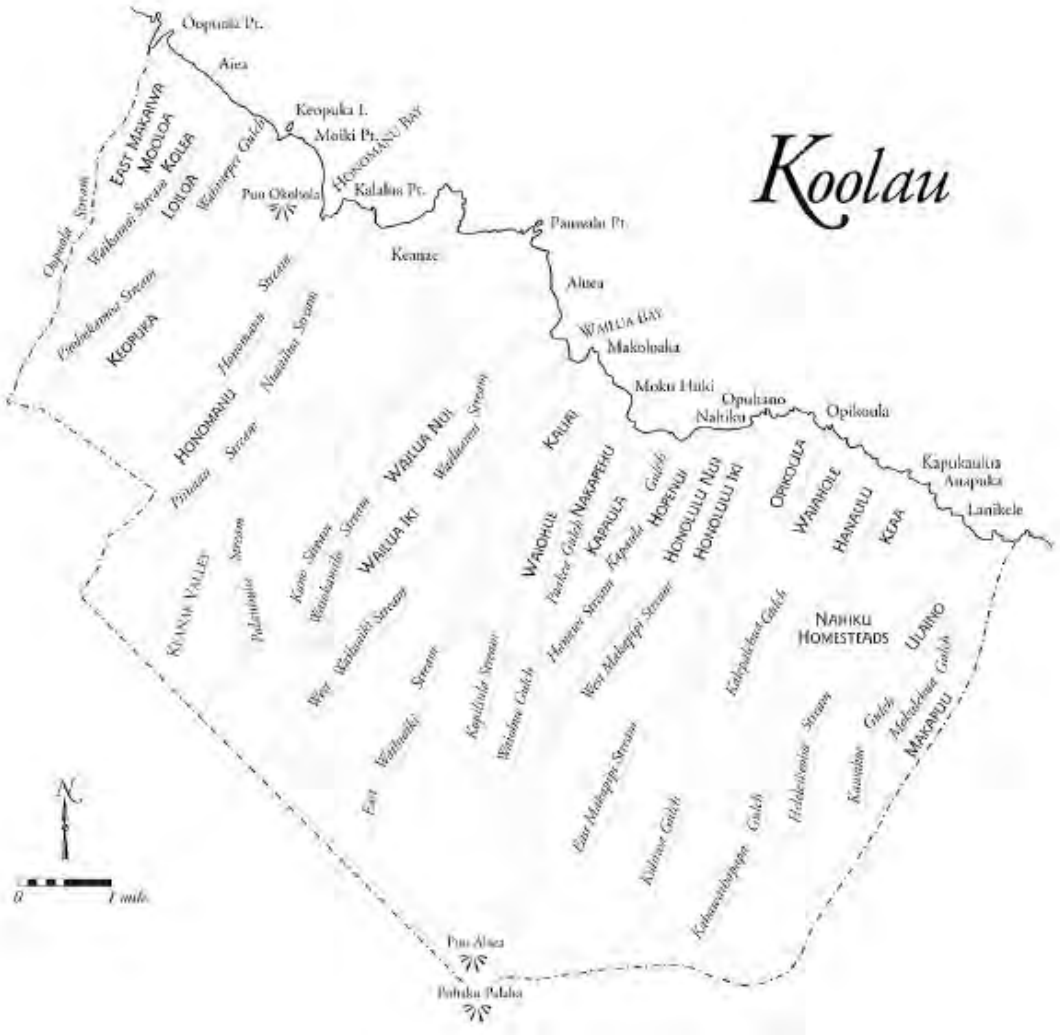


Figure 2: Map of the Traditional District of Koʻolau (From Sterling 1998: 108).

Figure 3: Map of the Traditional District of Hāna (From Sterling 1998: 118).

TRADITIONAL AND HISTORICAL CULTURAL CONTEXT

Traditionally, the Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various ahupuaʻa. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland kalo (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as kō (sugar cane, *Saccharum officinaruma*) and maiʻa (banana, *Musa* sp.), were also grown and, where appropriate, such crops as ʻuala (sweet potato, Ipomoea batatas) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985).

Contact with the western world occurred in mid-January 1778, with the arrival of Captain James Cook in the Hawaiian Islands during his third voyage into the Pacific Ocean (Daws 1968:1). This section discusses traditional life prior to Cook's arrival. During the pre-Contact Period, "…the two adjacent areas of Keʻanae and Wailua-nui comprise[d] the fourth of the main Maui centers and the chief center on this rugged eastern coast. It supported intensive and extensive wet-taro cultivation" (Handy and Handy 1972:272). The other centers of population on the Island of Maui was the area known as Nā Wai ʻEhā (which was comprised of Waiheʻe, Waiʻehu, Wailuku and Waikapū Ahupuaʻa), in Central Maui; the area extending from ʻOlowalu to Honokōhau on West Maui; and Hāna, on East Maui.

Maly and Maly (2001:8) assert:

> Based upon early historical observations (ca. A.D. 1778-1850), settlement in the watered valley environments of Hāmākua-Koʻolau, consisted of permanent residences which centered near the shore and spread along the valley floors. Residences also extended inland along near-shore kula (flat land or plateaus), and in fewer instances into the upper valleys. Temporary houses from which mountain resources (such as olonā, koa, and birds) were collected, extended into the upper valley areas, among fields on stream flats and on adjacent slopes. Two primary forms of agricultural sites occur in these watered valley contexts, they are the loʻi kalo (irrigated and drainage taro farming field systems) on the valley floors and slopes; and the kula and kīhāpai dry land farming plots where crops such as ʻuala (sweet potatoes), kō (sugar canes), kalo (taro), maiʻa (bananas and plantains), and wauke (paper mulberry) were cultivated.

TRADITIONAL SETTLEMENT PATTERNS

Archaeological settlement pattern data suggests that initial colonization and occupation of the Hawaiian Islands first occurred on the windward shoreline areas of the main islands between A. D. 850 and 1100, with populations eventually settling in drier leeward areas during later periods (Kirch 2011). Although coastal settlement was dominant, native Hawaiians began cultivating and living in the upland kula (plains) zones. Greater population expansion to inland areas began around the 14th century and continued through the 16th century. Large scale or intensive agriculture was implemented in association with habitation, religious, and ceremonial activities.

In Hawaiʻi, much of the coastal lands were preferred for chiefly residence. Easily accessible resources such as offshore and onshore fishponds, the sea with its fishing and surfing - known as the sports of kings, and some of the most extensive and fertile wet taro lands were located in the coastal areas (Kirch and Sahlins, 1992 Vol. 1:19). Inland resources necessary for subsistence could easily be brought to the aliʻi residences on the coast from nearby inland plantations. The majority of farming was situated in the lower portions of stream valleys where there were broader alluvial flat lands or on bends in the streams where alluvial terraces could be modified to take advantage of the stream flow. Dry land cultivation occurred in colluvial areas at the base of gulch walls or on flat slopes (Kirch 1985; Kirch and Sahlins 1992, Vol. 2:59).

WAHI PANA (LEGENDARY PLACES)

"Wahi Pana" can be defined as celebrated or noted places or locations (Pukui and Elbert 1986:313, 376), and refers to legendary places or landmarks of historical significance. These places of note have distinctive features (i.e., mountain peaks, streams, wind, rain, etc.) that are given specific names through which the history of an area is passed down from generation to generation through chants, legends, and songs (mele). The wahi pana associated with this project are presented with the ahupuaʻa and district discussions below.

PAST POLITICAL BOUNDARIES

Approximately 600 years ago, the Hawaiian population had expanded throughout the Hawaiian Islands to a point where large, political districts could be formed (Lyons 1903; Kamakau 1991). During the pre-Contact Period, Maui was divided into twelve districts (moku) (Sterling 1998:3). Following the Civil Code of 1859, the twelve districts were consolidated into four districts: Lāhainā, Wailuku, Makawao, and Hāna (Sterling 1998:3). Approximately 600 years ago, the Island of Maui was divided into twelve districts: Lāhainā, Kula, Honuaʻula, Kahikinui, Kaupō, Kīpahulu, Hāna, Koʻolau, Hāmākualoa, Hāmākuapoko, Wailuku, and Kāʻanapali (Sterling 1998:3;see Figure 4). The division of Maui Island lands into districts and sub-districts was performed by a kahuna (priest, expert) named Kalaihaʻōhia, during the time of the aliʻi Kakaʻalaneo (Beckwith 1979:383; Fornander [1919-20, Vol. 6:248] places Kakaʻalaneo at the end of the 15th century or the beginning of the 16th century). Land was considered the property of the king or aliʻi ʻai moku (the aliʻi who eats the island/district), which he held in trust for the gods.

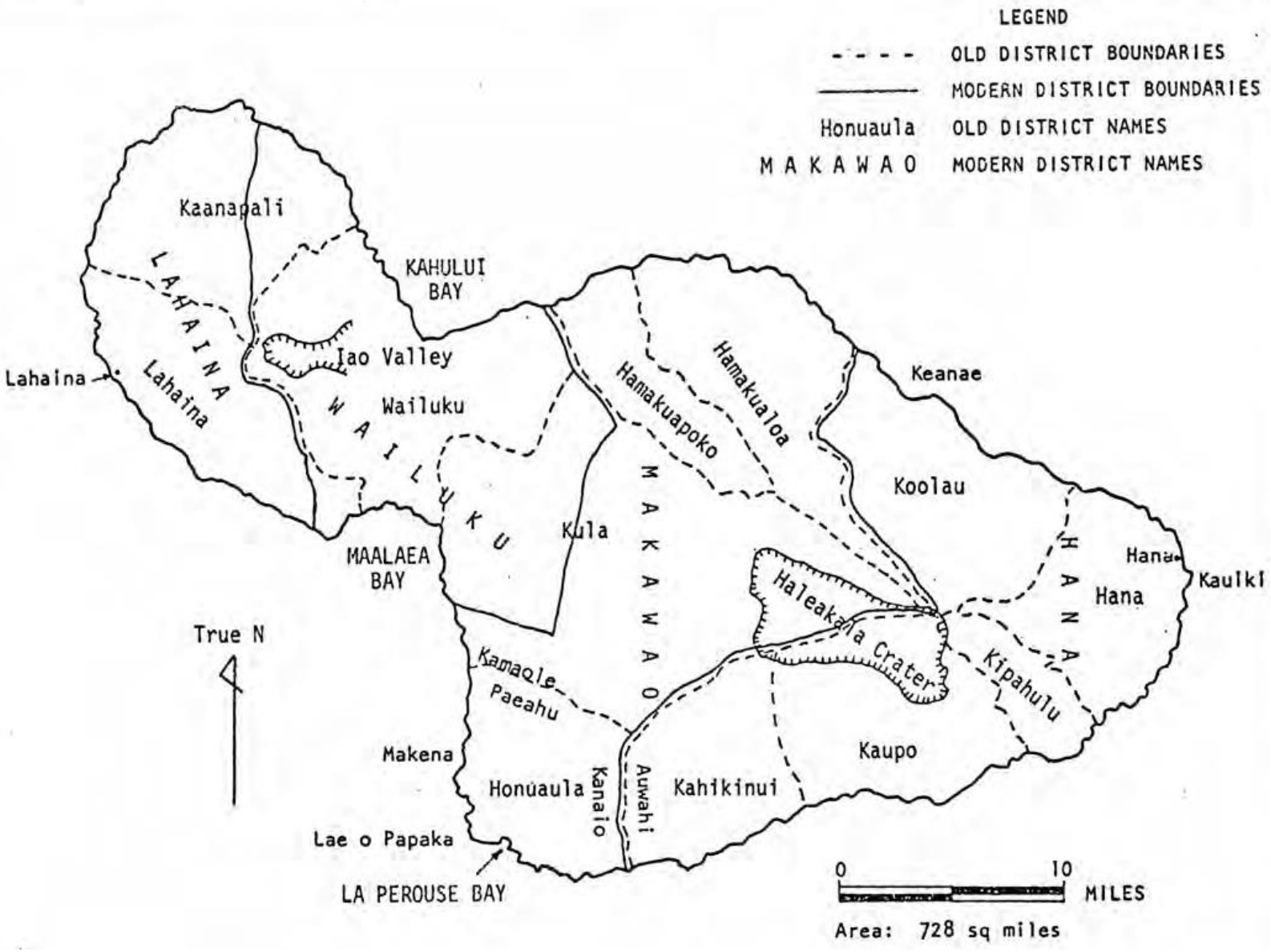


Figure 4: Traditional and Modern Districts of Maui (c. 1875; from Barrère 1975:31).

The title of aliʻi ʻai moku ensured rights and responsibilities to the land but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The makaʻāinana (commoners) worked the individual plots of land. The Sessions Law of 1909 reconfigured the district boundaries on the islands of Maui to form six districts. The district boundaries were further redefined in 1932 (R.D. King cited in Sterling 1998:4) .

In general, several terms, such as moku, ahupuaʻa, ʻili or ʻili ʻāina were used to delineate various land sections. A moku contained smaller land divisions (ahupuaʻa), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the ahupuaʻa were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each ahupuaʻa to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The ʻili ʻāina or ʻili were smaller land divisions next to importance to the ahupuaʻa and were administered by the chief who controlled the ahupuaʻa in which it was located (Lyons 1875: 33; Lucas 1995:40). The moʻoʻāina were narrow strips of land within an ʻili. The land holding of a tenant or hoa ʻāina residing in an ahupuaʻa was called a kuleana (Lucas 1995:61).

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on Western concepts. At the time of Kauikeaouli (Kamehameha III, r. 1825–1854), a consequential transition from traditional land tenure to private ownership took place; that change is commonly called the Māhele (from Hawaiian, "division"). As early as 1841, the legislature allowed island governors to lease lands to foreigners for up to fifty years. These leases were then to be registered "in writing so that there be no misunderstandings about terms and rents" (Daws 1974: 125). The question of land reform was set aside in 1843 because of the five-month occupation of the islands by British naval officer George Paulet, but once the kingdom was stable again and Kauikeaouli felt secure at its helm it was brought back (Daws 1974: 125). By 1844 many chiefs were warming up to the proposal for a formal land division, and in 1845 the Board of Commissioners to Quiet Land Titles (the Land Commission), was established for "the investigation and final ascertainment or rejection of all claims of private individuals, whether natives or foreigners, to any land property" (Chinen 1958: 8). The Commission had no authority to divide lands or change their tenure, but was created solely for approval of land claims (Kuykendall Vol. I, 1938: 280).

The Māhele of 1848 divided Hawaiian lands between the king, the chiefs (aliʻi and konohiki), and the government, introducing the foreign concept of private land ownership and setting the stage for vast changes to land holdings in the islands. Article IV of the Board of Commissioners to Quiet Land Titles was passed in December 1845, initiating legal private land ownership. In January 1846,

land was made available to the commoners (makaʻāinana). Once lands private ownership was instituted, Hawaiians, including the makaʻainana, were able to claim land plots upon which they had been cultivating and living through the Kuleana Act of 1850. These claims did not include any previously cultivated but presently fallow land, stream fisheries, or many other resources necessary for traditional survival (Kameʻeleihiwa 1992: 295). Once Hawaiians established their occupation of property through the testimony of two witnesses, the petitioners were awarded the claimed land, which was called Land Commission Award (LCA), or kuleana lands, and issued a Royal Patent (RP), after which they could take possession of the property (Chinen 1961: 16). Commoners claiming house lots in Honolulu, Hilo, and Lāhainā were also required to pay commutation to the government before obtaining a Royal Patent for their awards.

Foreigners could acquire land through the Alien Landownership Act of 1850. Oftentimes, they were simply given lands by the aliʻi. Commoners, however, could make claims only if they had first been made aware of the foreign procedures. Many of them found them unfamiliar, lengthy and costly, and as a result many Hawaiians missed an opportunity to claim for themselves the lands that had been sustaining their ancestors (Daws 1974: 127–128; Chinen 1961: 16).

In some cases, the Hawaiian government sold lands to generate income for the Kingdom. These lands were referred to as land grants. According to the Waihona Aina Online Database (2021):

> At the time of the Mahele, some of the land was the King's own land which later became known as Ceded Lands. Other lands in the possession of aliʻi were returned to the King in exchange for Commutation of property the aliʻi kept. Some of these returned lands became Government lands and were sold by the government to generate income for the Kingdom, since the King gave up his traditional right to collect taxes and goods following the Mahele.

The LCAs and Land Grants for lands associated with this project are presented with the ahupuaʻa and district discussions below.

MODERN LAND DIVISIONS

According to R.D. King (cited in Sterling 1998:4), the Session Laws of 1909 redefined the land divisions on the islands of Maui, Molokaʻi, Lānaʻi, and Kahoʻolawe. Thus, the twelve traditional districts described elsewhere in this reports were consolidated into the following six modern districts (see Figure 4):

1. Kahikinui, Kaupo, Kipahulu, Hana and Koolau, to be styled the Hana district;
2. Hamakualoa, Hamakuapoko, Kula, and Honuaula, the western boundary being a line starting from the sea at Kapukaulua and running along the bottom of the gulch to the peak of "Puu o Kaia" ; thence to the peak of Kailua Hill; thence to "Puu o Koha" triangulation station; thence to "Puu o Kali" triangulation station; thence down along

the boundary of Waiohuli and Keokea to the sea, and the island of Kahoolawe, to be styled the Makawao district;

3. All that portion of central Maui lying east of a line along the boundary of Honokohau and Kahakuloa to the peak of Eke Hill; thence along the ridge of mountains and down the bottom of Manawainui gulch to the sea; and west of the boundary of Makawao district, to be styled the Wailuku district;

4. All that portion of Maui west of Wailuku district and including the island of Lanai, to be styled the Lahaina district…

THE HĀNA BELT ROAD

As the northern coast of East Maui is carved with deep valleys, the Hāna Belt Road, also known as the Hāna Highway, was built to facilitate travel between Kahului and the town of Hāna. Hāna Highway refers to the approximately 68 mile section of roadway beginning in Kahului (Route 36) and ending at Kalepa Gulch on the southeastern side of Maui. In addition, a 48-mile section of the Hāna Highway, beginning at 0.2 miles west of Mile Marker 3 on State Route 360 (Hāna Highway) and ending at Kalepa Gulch on County Route 31 (Piʻilani Highway, has been designated the Hāna Highway Historic District (SIHP # 50-50-va-1638). According to Duensing (2005, this section of the highway, which includes "the highest concentration of stylistically consistent historic bridges and culverts in the State of Hawaiʻi. The Hāna Belt Road has been designated as State Site 50-50-06, 07, 12, 13, 16, 17 -1638, and is listed on the State of Hawaiʻi Register of Historic Places and was listed on the National Register of Historic Places on June 15, 2001.

According to Duensing (2001), the Hāna Belt Road, was originally a trail built by the aliʻi, Kihapiʻilani, in the sixteenth century and called "the King's Highway." As this road encircled the island much like a belt, it became known as the Hāna Belt Road. Duensing (2001) further states:

> In 1828, missionaries noted that the trail was "paved" and extended over thirty miles. They reported that it was a great help in ascending and descending the steep mountains and cliffs in the area. The early trail switchbacks over the mountains near Honomana were still visible in the 1940s.Today, intact portions of the King's Highway remain, although most of the road has been obliterated by agriculture or paved over by modern roadways, including the Hāna Belt Road.

Prior to the construction of the King's Highway, Hāna was accessed via outrigger canoe and footpaths, and subsequent travel utilized horse trails and steamers (Duensing 2001). Duensing (2001) states:

> The modern history of the Hāna Belt Road began in the 1870s when fifteen miles of unpaved road was built from central Maui into East Maui's rain forest to facilitate the construction of the Hamakua Ditch, which was completed in 1878. … By the early 1900s, Maui leaders began planning for an improved route to Hāna. Beginning in 1908 and reaching a peak in 1911,

> numerous concrete bridges were built along the Hāna Coast in anticipation of road improvements.

Editorials of the day argued for a road that would connect to the rest of Maui. It was thought that a road running from the port at Kahului to a landing at Hana could divert the sizeable tourist traffic already enroute from Oʻahu to Hawaiʻi Island to see the volcanoes (Honolulu Star Bulletin 1914:4). Duensing (2001) states that:

> By 1920, the belt road from central Maui to Kailua was suitable for modern automobile traffic. Parts of the road were paved with macadam to ensure that it was passable during the rainy season.

While the Hāna Belt Road was competed in1926, it was not completely paved until 1962 (Duensing 2001).

The earliest over-land travelers to Hāna swung across the numerous gulches via ropes. According to Duensing (2005:27):

> Hawaiian travelers reportedly swung themselves over East Maui's rushing streams with ropes made of vines. Rather than travel over rough footpaths, they probably swam around points that jutted out into the ocean.

Duensing (2007:123) described early bridges as:

> Some crossings were rickety log bridges that “swayed and teetered” and had to be traversed one horse and rider at a time. [Jack] London observed that travelers quickly lost all fear, as the “ceaseless iteration of height and depth produced a state of consciousness in which height and depth were accepted as the ordinary conditions of existence.” Looking down four or five hundred feet below from horseback was commonplace, and London claimed, “non-productive of thrills.”

The concrete bridges within the project area were constructed between 1908 (Bridge #40, Mokulehua Stream Bridge) and 1929 (Bridge #2, the Kailua Stream Bridge).

PREVIOUS ARCHAEOLOGY

Archaeological studies in the greater area began in the early 20th Century by T. Thrum (1909), J. Stokes (1909–1916), and W. M. Walker (1931), under the auspice of the Bernice Pauahi Bishop Museum. The earliest reported archaeological work conducted in the District of Lāhainā, was carried out by Winslow Walker (1931), under the auspices of the Bishop Museum, as part of an island-wide archaeological survey of Maui. Walker's (cited in Sterling 1998:13), observations during this study indicate that the villages on Maui were most likely located at the "mouths of larger gulches or at least within sight of the sea" and that "[n]o villages were seen in the higher forested parts of the island although a few scattered house sites were observed."

This CIA report follows an archaeological inventory survey (AIS) of the bridge sites (Bassford et al. 2020). The bridges have also been documented through nomination forms, as all occur within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference No. 01000615/SIHP No. 50-50-va-01638). Appendix A of the Bassford et al. (2020) AIS report includes this document which provides all the background information to this study. Thus, this information is not repeated within the body of this CIA. In addition, the six bridges themselves have previously been fully documented and summarized, with information provided on the history of each bridge, the archaeological and cultural significance of each bridge location, a review of cultural sites that occurs near each of the bridges, and significance and context of each bridge (Folio et al. 2015).

TRADITIONAL MOKU OF HĀMĀKUALOA (MODERN DISTRICT OF MAKAWAO)

Bridge #2, the Kailua Stream Bridge, is located in the traditional moku (district) of Hāmākualoa (now Makawao District) (see Figure 1). Bridge #2 was constructed in 1929 along Hāna Highway, extends across Kailua Stream, and is located at the boundaries of Puʻuomāile and Pāpaʻaʻea Ahupuaʻa at milepost (MP) 5.9, 6.26 miles west of Kaumahina State Wayside Park Road crossing over the shallow, low-sloping Kailua Stream [TMK: (2) 2-9-010:001 por., (2) 2-9-014:001 por., (2) 2-9-012:041 por., (2) 2-9-013:015 por.] (Figures 5 and 6). Kailua stream bridge is situated 1.43 km (0.90 mi) from the coast and is 727 feet (ft.) amsl.

Figure 5: USGS Quadrangle (Haiku, HI, 1992; 1:24,000) Map Showing Location of Bridge #2 (Kailua Stream Bridge).

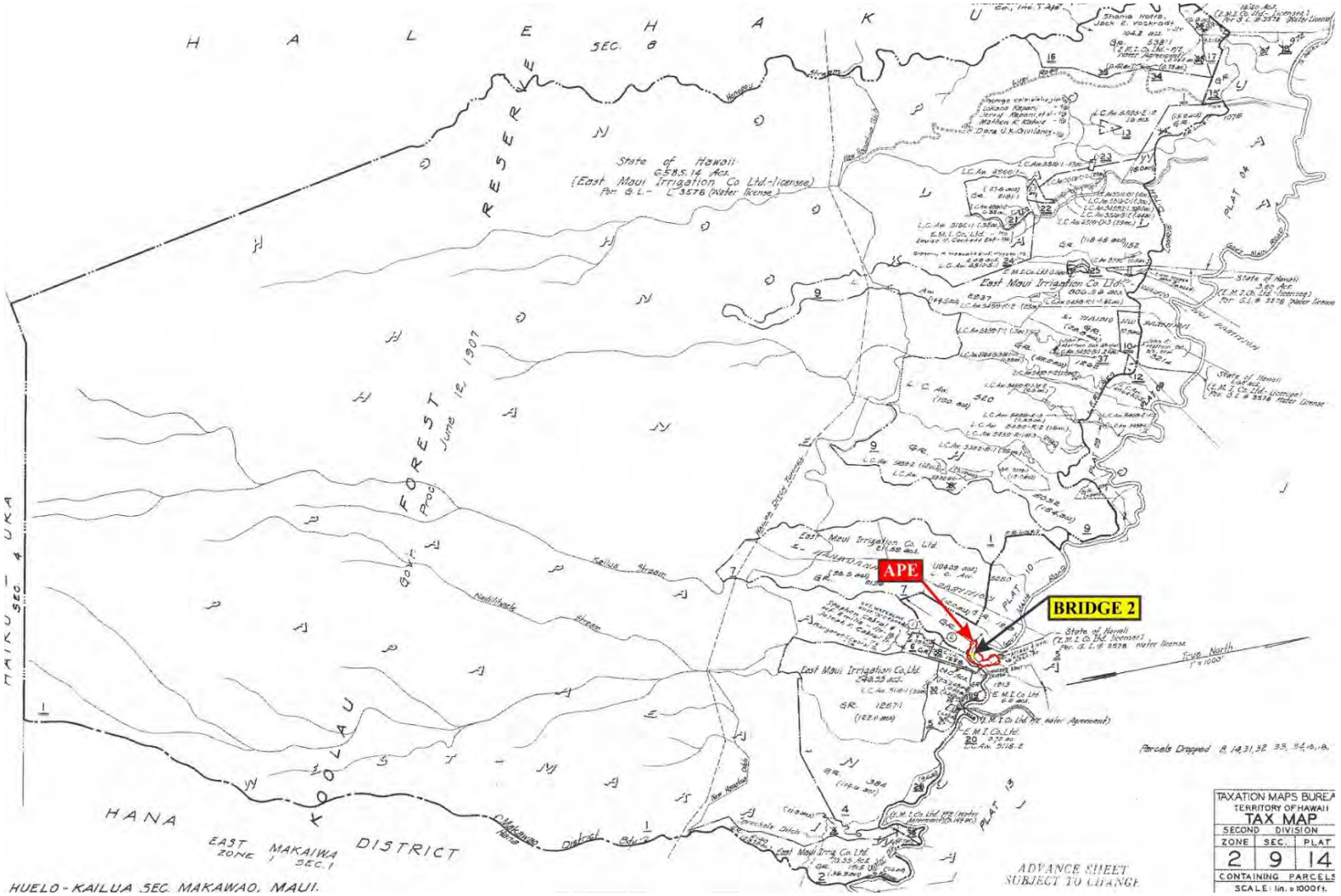


Figure 6: Tax Map Key [TMK: (2) 2-9-014] Showing the Location of Bridge #2 (Kailua Stream Bridge).

CLIMATE

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 3175.0 mm (125.00 in). The bridge is surrounded by dense vegetation described as Hawaiian introduced wet-mesic forest, a grassy hill, and is adjacent to a single residence. The mean annual temperature is 21.429 °C (70.572 °F) with a high of 23.907 °C (75.034°F) in the summer months and a low of 19.92 °C (67.85 °F) in the winter months (Giambelluca et al. 2014).

SOILS AND VEGETATION

According to Foote et al. (1972: Sheet Number 118; Figure 7) soils within the vicinity of Bridge #2 (Kailua Stream Bridge) are comprised of the Rough Mountainous land (rRT) Soil Series. This series consists of steep land divided by numerous intermittent drainage channels. Elevations range from sea level to above 6,000 ft. amsl. The soil mantle in these areas is normally very thin, ranging from 1-10 inches in thickness over saprolite. The land surface is dominated by V-shaped valleys that have extremely steep side slopes and narrow ridges between valleys. The soil material on the ridge tops is similar to that of the Amalu and Olokui series. Vegetation includes ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui and puakeawe. This land type is used for water supply, wildlife habitat, and recreation (Foote et al. 1972:118).

TRADITIONAL AND HISTORICAL BACKGROUND

According to Pukui et al. (1974:39), "Hāmākua" translates to "long corner" or kuhi loa. This area has been described by Handy and Handy (1972:498) as a coastal region "…where gently sloping kula [plains or open land] lands intersected by small gulches come down to the sea along the northern coast line of East Maui." Although this area did not receive large amounts of rainfall, the number of named narrow ahupua'a in this region suggest a sizeable population living in the region. It is likely the inhabitants of this area subsisted on the taro cultivated in lo'i watered by Kailua Stream and fished in the small bays along the coast for fishing, which were possibly accessed by the Alaloa, (long road) that extended around the Island of Maui (Handy and Handy 1972:498). In addition, Handy and Handy (1972:498) state that the area is likely to have been a favorable local for the cultivation of sweet potato, as well as "…breadfruit, banana, sugar cane, arrowroot; and for yams and 'awa in the interior."

WAHI PANA (LEGENDARY PLACES)

According to Kamakau (1961:112):

> Ke-a-ulu·moku was another celebrated man of Ka-lani-'opu'u's day. His father was the great chief Ka-ua-kahi-akua-nui, son of Lonomaka'i-honua and Kaha-po'ohiwi… He was celebrated as a composer of war chants, chants of praise, love chants, prophetic chants, and genealogical chants.When he went back to Hawaii with Ka-lani-'opu'u he was homesick for the two Hamakua districts of Maui where he had lived with Kamehamehanui and Ka-hekili.

Figure 7: USDA Soil Survey (Foote et al.1972: Sheet Number 113) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #2 (Kailua Bridge) and APE.

Ke-a-ulu·moku expressed his love and longing for the Hāmākua area in song. A portion of this mele is presented below:

Who belong to Hamakua,
The two districts of Hamakua,
Where my elder brothers live.
My hillside trails are theirs to rule,
They nurtured me until I loved them;
I find myself with other elder brothers
Who are not the same to me.

Let the rain fall, for rain is good.
It patters down, it pelts down,
It crushes the forest growth,4/26/2021
It sprinkles musically on the lehua.
The lehua trees blossom, the yellow lehua,
When the rain comes to the lehua of Kailua.
The lehua petals are heavy with raindrops,
Heavy, heavy and full ·blown.
They know not the pangs of thirst
That wilt the tint-blown pandanus bloom.
The rain returns by way of Haneho‘i,
Along the brow of Pu‘umaile to
Hoalua… [Kamakau 1961:113].

There are many traditional accounts of Kiha-a-Pi‘ilani (2nd born son of Pi‘ilani, 16th century ruler of Maui). Kamakau (1961:22 - 33) places some of the events involving Kiha-a-Pi‘ilani in the areas of Hāmākua and Hāna. Following the death of Pi‘ilani, it was said that there were two heirs to the kingdom. However, Lono-a-Pi‘ilani (1st born son of Pi‘ilani) was named the sole inheritor of the kingdom of Maui, as Kiha-a-Pi‘ilani was living on O‘ahu at the time of their father’s death. For the first few years after Pi‘ilani’s death, Kiha-a-Pi‘ilani lived under his brother’s rule and the two brothers lived in peace. However, rivalry and jealousy soon erupted between Kiha-a-Pi‘ilani and Lono-a-Pi‘ilani, as Lono-a-Pi‘ilani began to suspect that his brother was trying to undermine him and “seize the kingdom for himself.” Lono-a-Pi‘ilani began to abuse his brother, publicly humiliate him, and eventually set out to murder him. As a result, Kiha-a-Pi‘ilani fled the court of Lono-a-Pi‘ilani, first going to Moloka‘i and Lāna‘i then retuning in secret to Maui, where he eventually traveled to the uplands and lived in Hāmākua for a time, where he farmed and planned his brother’s demise and claiming the kingdom of himself.

PUʻUOMĀILE AND PĀPAʻAEA AHUPUAʻA

Bridge #2 spans Kailua Stream and forms the boundary between Puʻuomāile and Pāpaʻaʻea Ahupuaʻa. According to Pukui et al. (1974:204), Puʻuomāile literally translated means "hill of Māile (a kupua [demigod] goddess)."

In 1790, Kamehameha I invaded Maui, defeated Kalanikūpule, Kahelili's son, and conquered the island. One of the battles took place in Hämäkualoa, near Puʻuomāile Ahupuaʻa:

> Hearing of Kamehameha's approach Ka-lani-ku-pule sent an army to Hamakualoa under the warrior Kapa-kahili. The battle met at a small hill called "Bosun-bird Hill" (Puʻ ukoaʻe) situated on the makai side of Puʻumaile at Hanawana in Hoalua, and Kapa-kahili was defeated. In the evening Kamehameha beached at Halehaku, went ashore, and built temporary shelters just where he stepped foot. The feather god Ku-kaʻili-moku encouraged him to fight, for its feathers bristled and stood upright in the direction of Hina-wai-koliʻi; Kamehameha therefore lost his fear of a fight with slingshot. The next morning he saw through the koa and hala trees the red gleam of feather capes. It is said chat he narrowly escaped defeat by Kapa-kahili's company. But reinforcements carne up, Kamehameha put the enemy to flight, and pursued them along the main road or they would have rejoined their fellow warriors at Kokomo. At the ascent of ʻOpaepilau, Kapa-kahili was exhausted and was overtaken. "Slain by Pipili, " Kamehameha boasted over him [Kamakau 1961:148].

Pāpaʻaʻea literally means turtle-shell piece and refers to also refers to a long paved road that begins at Pāpaʻaʻea and was built by Kiha-a-Piʻilani (Pukui et al. 1974: 179). Moses Manu (cited in Sterling 1998:101) elaborates on the benefits of this road and shows how Kiha-a-Piʻilani took care of his people:

> When the chief and men had finished the work there [*on Kihapiilani Road*], the paving was begun in the forest of Oopuloa in Koolau, from Kawahinepee at Kaloa to Papaaea to Kaohekanu at Hamakualoa. This was a place made famous by robbers in the olden days. This road was treacherous and difficult for the stranger, but when it was paved by Kihapiilani this road became a fine thing.

Subsequently, William P. Alexander purchased 360 acres of land within Pāpaʻaʻea Ahupuaʻa for $180.00 in 1850, under Land Grant 384 (Waihona Aina Online Database 2021). Mr. W.P. Alexander (cited in Sterling 1998:107) explains the purchase to his son in a letter dated January 7, 1851:

> Besides my little Haiku farm, which you know, I have procured a tract called Papaaea [Grant 384], where you and I took dinner the day we went to examine the boundary of Hamakua & Koolau, so as to guess where the famous Pohaku

> oki aina was located, you may remember that we lodged that night at Huelo with Mr. & Mrs. Whittlesey, Papaea is rather a wet region, joins the harbor of Makeina [Makaiwa], is nobly wooded and would make a nice farm - I have also 250 acres in Kaupakulua Hikina [between Haiku and Ulumalu], on the best land of Maui - I hope therefore that none of my children who have a thirst for an education shall be denied it for the lack of means.

HISTORIC PERIOD (POST-1778)

Early records, such as journals kept by explorers, travelers and missionaries, documenting Hawaiian traditions that survived long enough to be written down, and archaeological investigations have assisted in the understanding of traditional cultural activities. Contact with the western world occurred on January 18, 1778, with the arrival of Captain James Cook in the Hawaiian Islands during his third voyage into the Pacific Ocean (Daws 1968:1). Descriptions of the north coast of Maui were first recorded in November of 1778 as the Resolution and the Discovery sailed down a portion of Hamakualoa (Beaglehole 1967: Part I, Vol. III). David Samwell, surgeon on the Discovery, reported that "...the ships lay to all day about 3 miles off shore, trading with the Natives who came off in their canoes in great number..." (Beaglehole 1967, Part I, Vol. III:1151). Beaglehole (1967, Part I, Vol. III:1151) recorded that:

> Kahekili was "a middle aged man ... rather of a mean appearance..." and the land was "...mountainous, the sides of the hills are covered with trees… large open plains on which stand their houses & where they have their plantations of sweet potatoes, taro & c. ..."

In 1828, a party of missionaries travelled around the island. In Hāmākualoa they came across a roadway paved with stone and built in the 16th century:

> It extends more than 30 miles, and is a work of considerable magnitude. This pavement afforded us no inconsiderable assistance in traveling as we ascended and descended a great number of steep and difficult paries (palis). [Kuykendahll 1931cited in Sterling 1998:104)].

LAND COMMISSION AWARDS AND LAND GRANTS

According to the Office of Hawaiian Affairs Kipuka Online Database (2021), there were no awarded Land Commission Awards or Land Grants on the parcels associated with Bridge #2, the Kailua Stream Bridge.

TRADITIONAL MOKU OF KOʻOLAU (MODERN DISTRICT OF HĀNA)

The traditional district of Koʻolau, now part of the modern Hāna District, was comprised of a series of ahupuaʻa located along the north-facing section of East Maui. Bridges #5, #8, #19, and #39 are located in this area within the ahupuaʻa of East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, and ʻUlaʻino (see Figure 2).

Bridge #5, the Makanali Stream Bridge, is located in East Makaīwa Ahupuaʻa. It was constructed in 1928 along Hāna Highway and extends across Makanali Gulch and Makanali Stream at MP 8.22. The bridge is situated approximately 3.90 miles west of Kaumahina State Wayside Park Road [TMK: (2) 1-1-001:036 por. and 042 por.] (Figures 8 and 9). The area includes wooded, yet open valley area, dense vegetation, and land cover described as Hawaiian introduced perennial grassland. Makanali Stream bridge is located 0.20 km (0.13 mi) from the coast and is 386 ft. amsl.

CLIMATE (BRIDGE #5)

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 3139.7 mm (123.61 in). The mean annual temperature is 22.113 °C (71.803 °F) with a high of 23.80 °C (74.80 °F) in the summer months and a low of 20.50 °C (68.90 °F) in the winter months (Giambelluca et al. 2014).

SOILS AND VEGETATION (BRIDGE #5)

According to Foote et al. (1972: Sheet Number 121; Figure 10) soils within the vicinity of Bridge #5 (Makanali Stream Bridge) are comprised of the Rough Mountainous land (rRT) Soil Series. This series consists of steep land divided by numerous intermittent drainage channels. Elevations range from sea level to above 6,000 ft. amsl. The soil mantle in these areas is normally very thin, ranging from 1 to 10 inches in thickness over saprolite. The land surface is dominated by V-shaped valleys that have extremely steep side slopes and narrow ridges between valleys. The soil material on the ridge tops is similar to that of the Amalu and Olokui series. Vegetation includes ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui and puakeawe. This land type is used for water supply, wildlife habitat, and recreation (Foote et al. 1972:118).

Bridge #8, the Puohokamoa Stream Bridge, is located in Kōlea and Loiloa Ahupuaʻa. It was constructed in 1912 along Hāna Highway and extends over Puohokamoa Stream. The bridge is situated at MP 10.95, approximately 1.16 miles west of Kaumahina State Wayside Park Road [TMK: (2) 1-1-001:022 por., 023 por., 044 por., and 052 por.] (Figures 11and 12). The bridge is built adjacent to an arboretum. There is open, but dense, groundcover which includes ti leaf plants on the downstream hillside. The bridge is also located adjacent to a private property. Puohokamoa Stream Bridge is located .84 km (.52 mi) from the coast and is 507 ft. amsl.

Figure 8: USGS Quadrangle (Keanae, HI, 1983; 1:24,000) Map Showing Location of Bridge #5 (Makanali Stream Bridge).

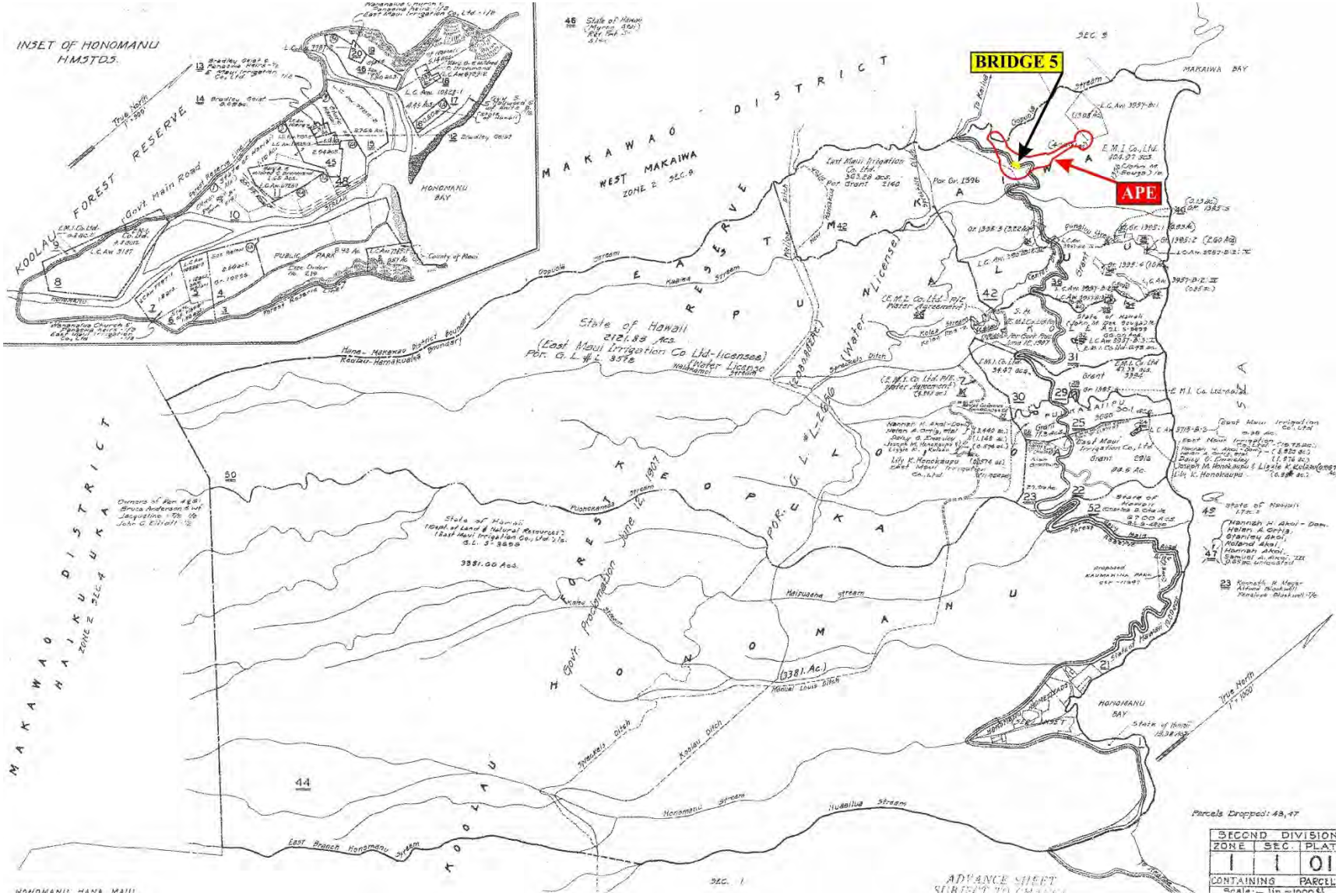


Figure 9: Tax Map Key [TMK: (2) 1-1-001] Showing the Location of Bridge #5 (Makanali Stream Bridge).

Figure 10: USDA Soil Survey (Foote et al.1972: Sheet Number 121) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #5 (Makanali Stream Bridge) and APE.

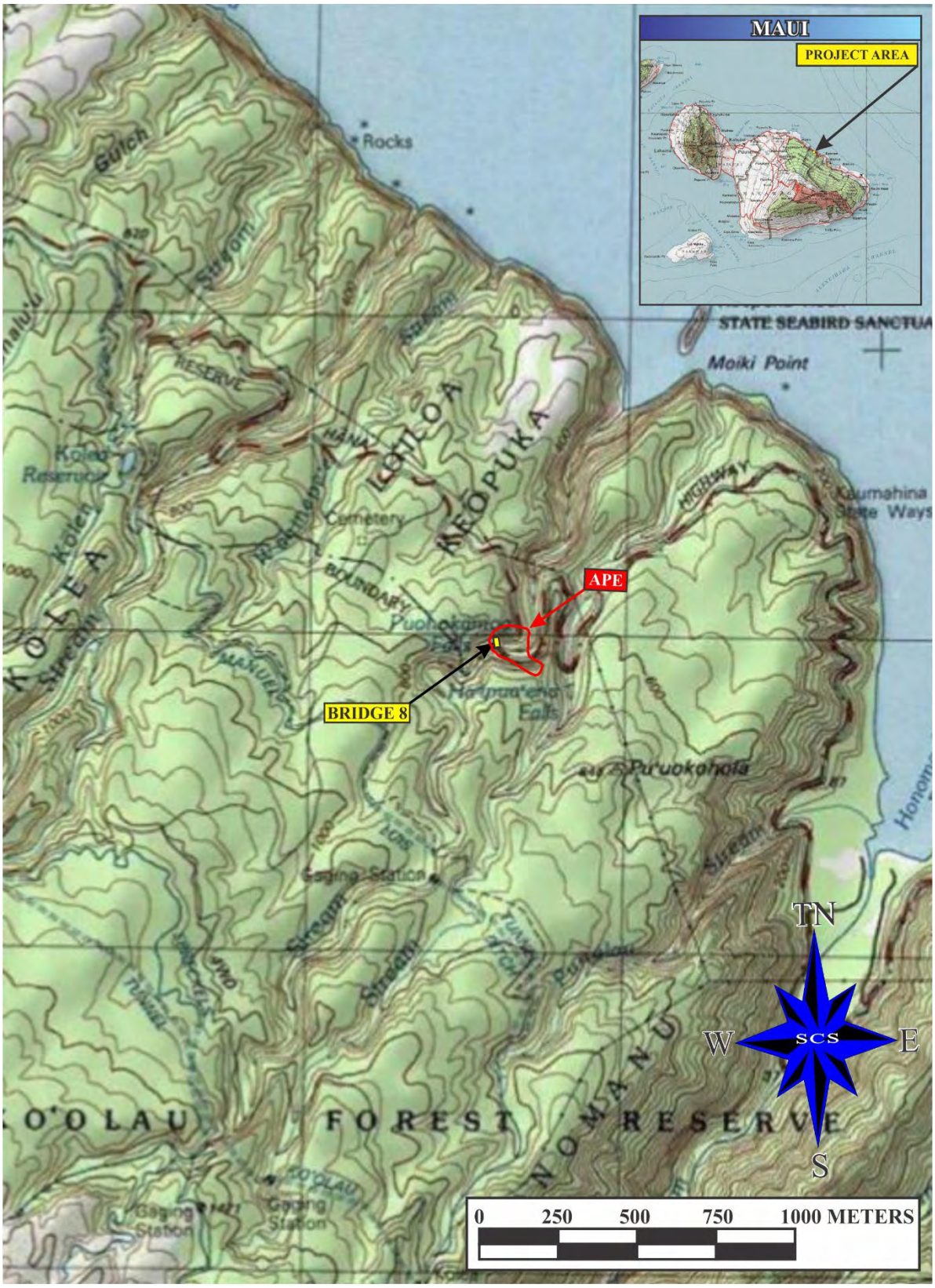


Figure 11: USGS Quadrangle (Keanae, HI, 1983; 1:24,000) Map Showing Location of Bridge #8 (Puohokamoa Stream Bridge).

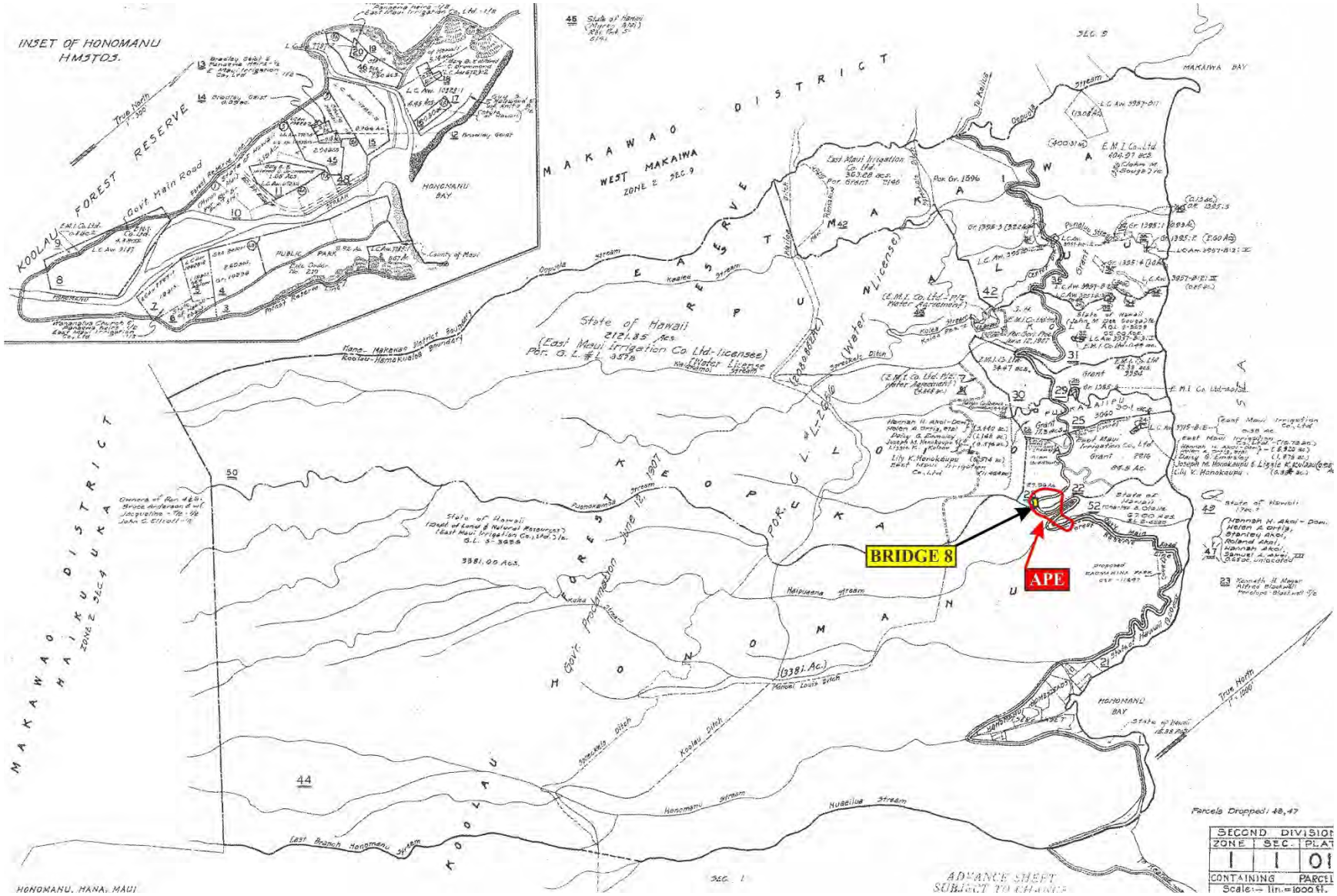


Figure 12: Tax Map Key [TMK: (2) 1-1-001] Showing the Location of Bridge #8 (Puohokamoa Stream Bridge).

CLIMATE (BRIDGE #8)

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 3759.1 mm (148.00 in). The mean annual air temperature is 21.499 °C (70.7 °F), with a high of 23.32 °C (73.81 °F) in the summer and a low of 19.00 °C (67.99 °F) in the winter (Giambelluca et al. 2014).

SOILS AND VEGETATION (BRIDGE #8)

According to Foote et al. (1972: Sheet Number 121; Figure 13) soils within the vicinity of Bridge #8 (Puohokamoa Stream Bridge) are comprised of the Rough Mountainous land (rRT) Soil Series. This series consists of steep land divided by numerous intermittent drainage channels. Elevations range from sea level to above 6,000 ft. amsl. The soil mantle in these areas is normally very thin, ranging from 1 to 10 inches in thickness over saprolite. The land surface is dominated by V-shaped valleys that have extremely steep side slopes and narrow ridges between valleys. The soil material on the ridge tops is similar to that of the Amalu and Olokui series. Vegetation includes ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui and puakeawe. This land type is used for water supply, wildlife habitat, and recreation (Foote et al. 1972:118).

Bridge #19, the Kopili‘ula Stream Bridge, is located in Kaliae and Kekuapawela Ahupua‘a and extends over Kopili‘ula Stream. Bridge #19 was constructed in 1926 along Hāna Highway at MP 21.73, and is approximately 2.80 miles east of the Wailua Valley Lookout [TMK: (2) 1-2-001:003 por., (2) 1-2-004:005 por.] (Figures 14 and 15). The Kopili‘ula Stream Bridge (Bridge #19) is associated with a potential staging area 198.24 meters (0.12 mi) to the northeast. This area is covered by the same vegetation and receives roughly the same mean annual rainfall and mean annual air temperature as the Kopili‘ula Stream Bridge area. The potential staging area is approximately 9997 ft amsl.

CLIMATE (BRIDGE #19)

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 5721.00 mm (225.24 in). The mean annual air temperature is 19.543 °C (67.177 °F) with a high of 20.19 °C (70.14 °F) in the fall and a low of 18.40 °C (65.12 °F) in the spring (Giambelluca et al. 2014). Hawaiian lowland rainforest covers the hillside. The Kopili‘ula Stream Bridge is located 2.30 km (1.41 mi) from the coast and is 1286 ft amsl.

SOILS AND VEGETATION (BRIDGE #19)

According to Foote et al. (1972: Sheet Number 122; Figure 16) soils within the vicinity of Bridge #19 (Kopili‘ula Stream Bridge) are comprised of the Rough Mountainous land (rRT) Soil Series. This series consists of steep land divided by numerous intermittent drainage channels.

Figure 13: USDA Soil Survey (Foote et al.1972: Sheet Number 121) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #8 (Puohokamoa Stream Bridge) and APE.

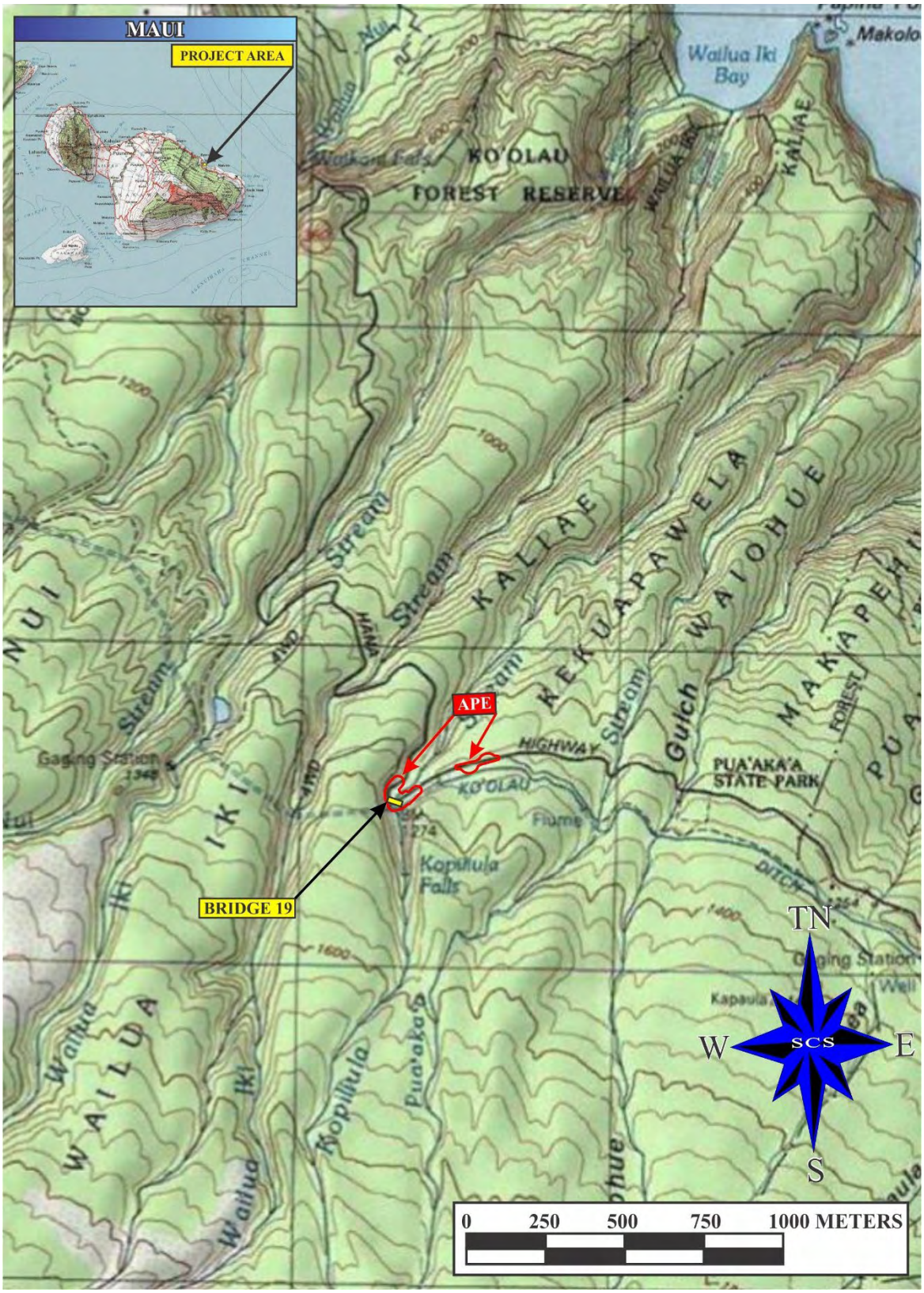


Figure 14: USGS Quadrangle (Nahiku, HI, 1983; 1:24,000) Map Showing Location of Bridge #19 (Kopili‘ula Stream Bridge).

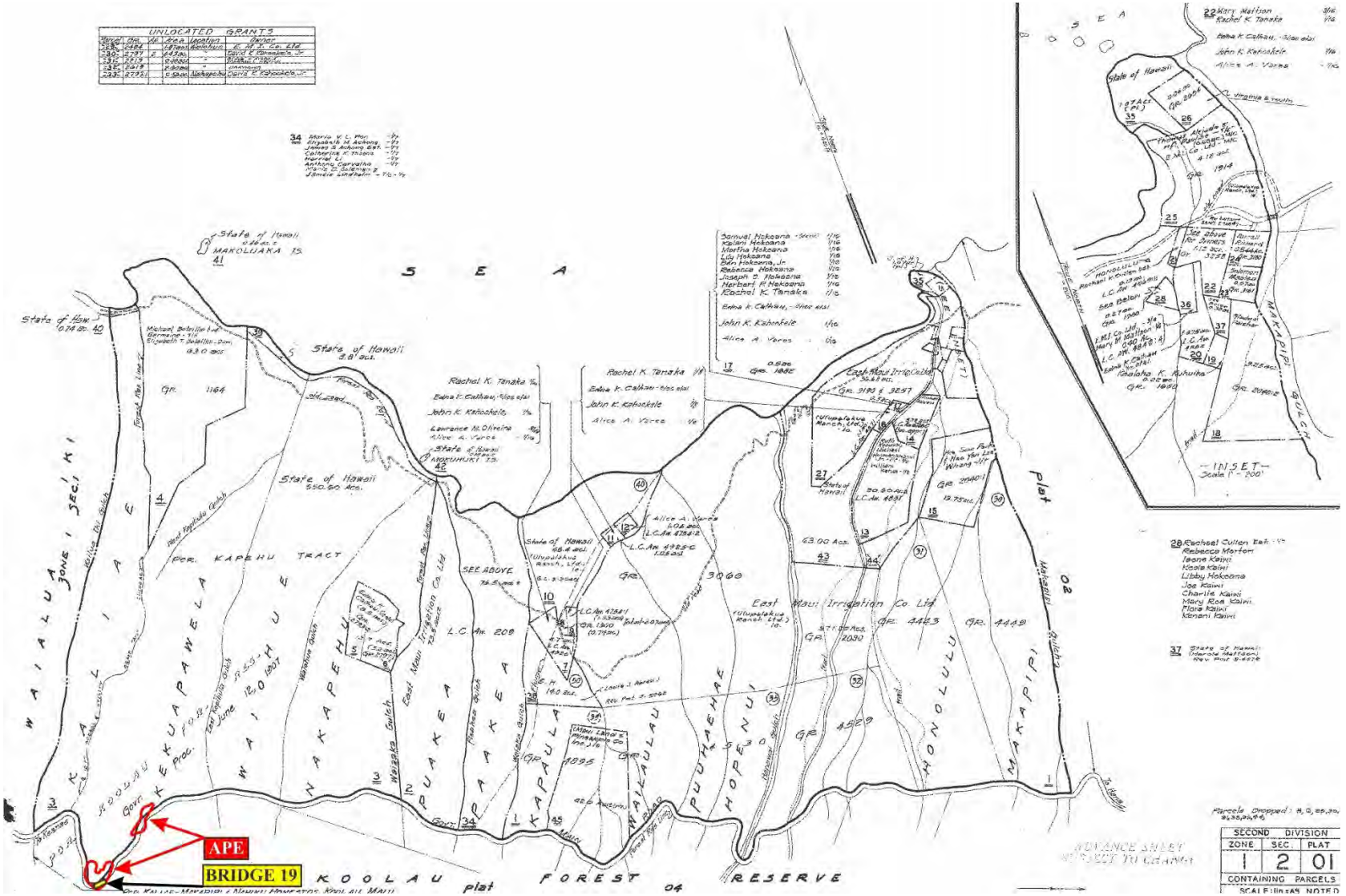


Figure 15: Tax Map Key [TMK: (2) 1-2-001] Showing the Location of Bridge #19 (Kopili‘ula Stream Bridge).

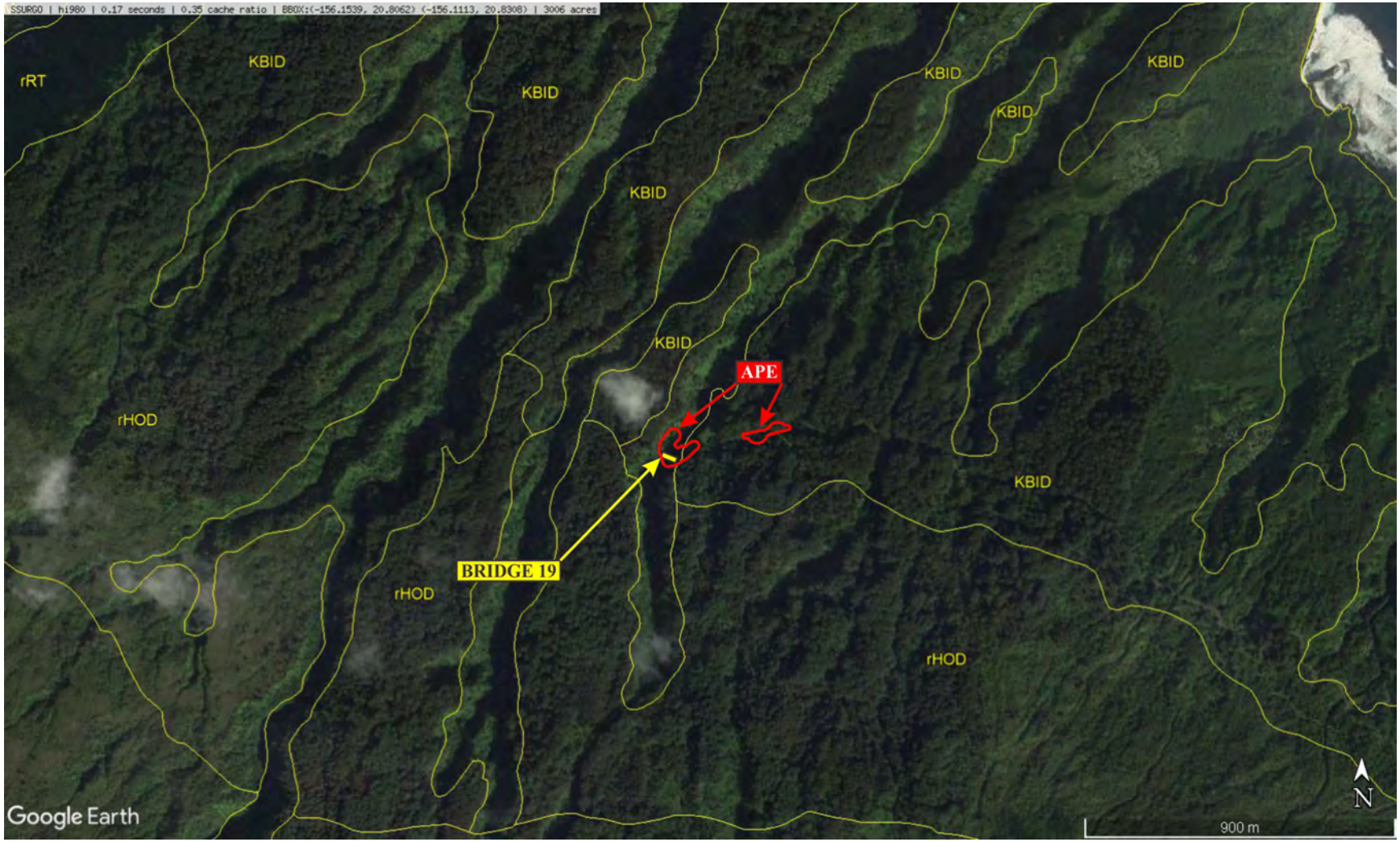


Figure 16: USDA Soil Survey (Foote et al.1972: Sheet Number 122) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #19 (Kopili‘ula Stream Bridge) and APE.

Elevations range from sea level to above 6,000 ft. amsl. The soil mantle in these areas is normally very thin, ranging from 1 to 10 inches in thickness over saprolite. The land surface is dominated by V-shaped valleys that have extremely steep side slopes and narrow ridges between valleys. The soil material on the ridge tops is similar to that of the Amalu and Olokui series. Vegetation includes ohia, false staghorn fern, tree fern, yellow foxtail, lantana, kukui and puakeawe. This land type is used for water supply, wildlife habitat, and recreation (Foote et al. 1972:118).

Bridge #39, the ʻUlaʻino Stream Bridge, is located in ʻUlaʻino Ahupuaʻa and extends over ʻUlaʻino Stream. Bridge #39 was constructed in 1914 along Hāna Highway at MP 27.9, and is approximately 2.96 miles east of Lower Nāhiku Road [TMK: (2) 1-2-003:001 por. and 005 por.] (Figures 17 and 18). The landcover includes Hawaiian lowland forests. The bridge spans a lava rock stream and is situated adjacent to a rural residential neighborhood. The geographical setting includes open sloping terrain with views of the stream below. This bridge is located approximately 1.04 km (.65 mi) from the coast and is 357 ft. amsl.

CLIMATE (BRIDGE #39)

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 2,113.2 mm (161.94 in). The mean annual air temperature is 21.605 °C (70.89 °F) with a high of 23.08 °C (73.54 °F) in the fall and a low of 20.01 °C (68.02 °F) in the spring (Giambelluca et al. 2014).

SOILS AND VEGETATION (BRIDGE #39)

According to Foote et al. (1972: Sheet Number 127; Figure 19) soils within the vicinity of Bridge #39, the ʻUlaʻino Stream Bridge, are comprised of Hana very stony silty clay loam (HKLD). This soil is on smooth, low mountain slopes. The surface layer is very dark grayish-brown silty clay loam about 12 inches thick. The subsoil is dark brown silty clay loam. The surface layer consists of a strong to medium acidity and the subsurface layer is slightly acidic. This soil has been used for pasture (Foote et al. 1972:37).

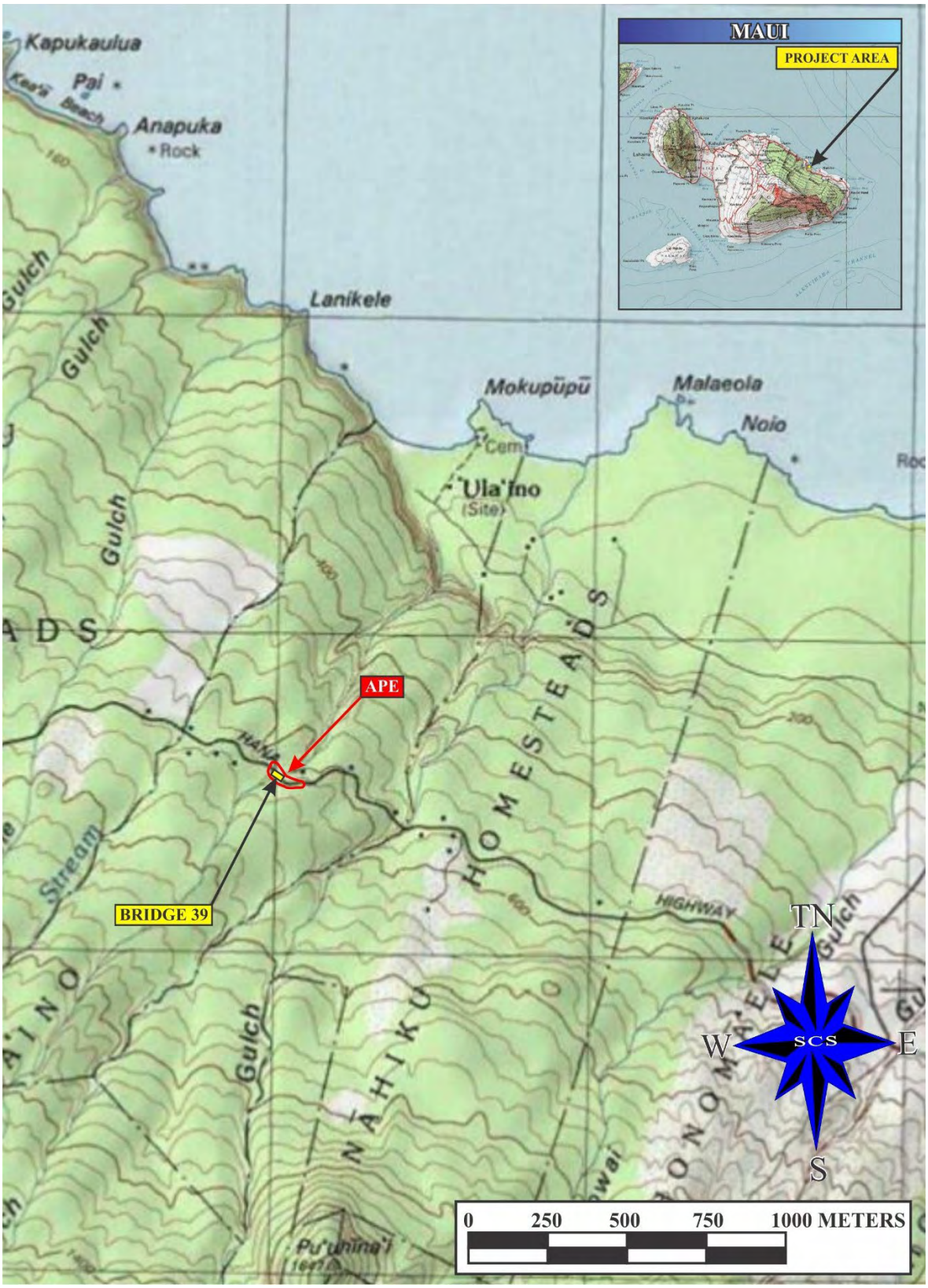


Figure 17: USGS Quadrangle (Hana, HI, 1983; 1:24,000) Map Showing Location of Bridge #39 (‘Ula‘ino Stream Bridge).

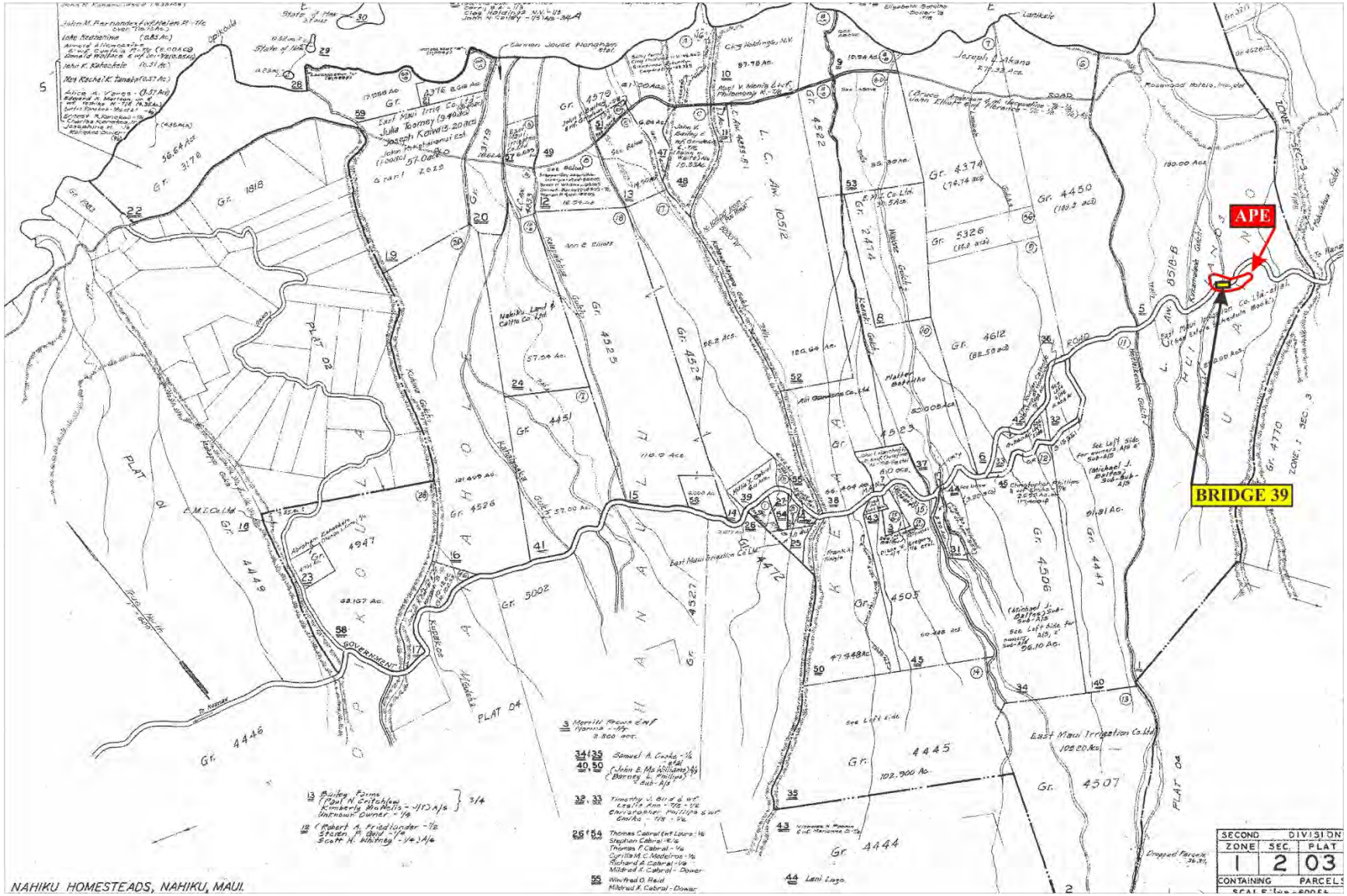


Figure 18: Tax Map Key [TMK: (2) 1-2-003] Showing the Location of Bridge #39 (‘Ula‘ino Stream Bridge).

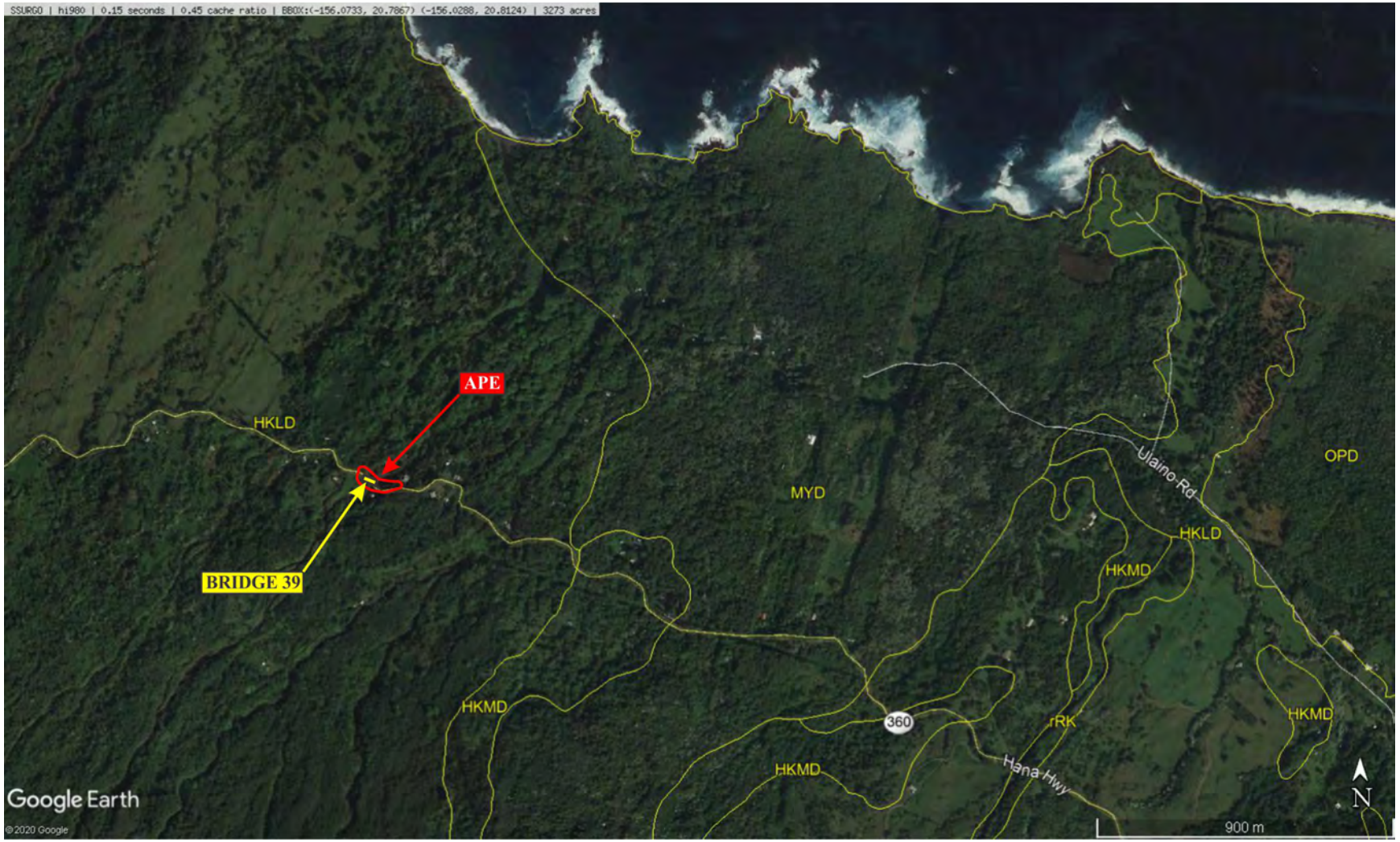


Figure 19: USDA Soil Survey (Foote et al.1972: Sheet Number 127) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #39 (‘Ula‘ino Stream Bridge) and APE.

TRADITIONAL AND HISTORICAL BACKGROUND

As stated elsewhere in this document, Bridges #5, #8, #19, and #39 are located in the traditional moku (district) of Koʻolau (now Hāna District) (see Figure 2), within the ahupuaʻa of East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, and ʻUlaʻino, which are briefly discussed below.

As shown in Figure 1 and Figure 2, Oʻopuola Gulch forms the boundary between the traditional districts of Hāmākua and Koʻolau. "Koʻolau" literally translates to "windward" (Pukui et al. 1974:117). Handy and Handy (1972:498) describe this region as having:

> precipitous slopes eroded by the waves which the tradewinds sweep against its cliffs, islets, and inlets. Here the flank of Haleakala is steep, and as the trade winds blowup across their forested slopes they are cooled and release their moisture, making this the wettest coastal region in all of the islands.

Handy and Handy (1972:501) further state:

> Throughout the Koʻolau, the wild taro growing along the streams and in the pockets high on the canyon walls of the gulches bespeaks former planting of stream taro along the watercourses, on the sides of the gulches, and in the forests above. The same is true of the wild taros seen here and there in the present forest above the road and in the protected spots on what was formerly low forest land, now used as pasture.

Honomanū Ahupuaʻa, southeast of Bridge #5 and Bridge #8, consisted of a "broad, deep valley containing a large "at its seaward end" (Handy and Handy 1972:498). Old terraces were still visible in the back of the valley at the time of Handy's fieldwork (c. 1940s). In addition, Honomanū Bay was large enough to accommodate canoes and equipment used for fishing. Thus, it is quite likely Honomanū Ahupuaʻa a sizeable population inhabited the valley during the pre-Contact Period (Handy and Handy 1972:498).

East of Nāhiku Ahupuaʻa, the large streams and gulches disappear. Handy and Handy (1972:501) state, "The shore is low and the terrain gently sloping and junglelike." A large pandanus (hala) forest that extends from ʻUlaʻino Ahupuaʻa into the modern district of Hāna.

EAST MAKAĪWA, KŌLEA, LOILOA, KALIAE, KEKUAPAWELA, AND ʻULAʻINO AHUPUAʻA

There is very limited information in the literature that pertains directly to the ahupuaʻa of East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, and ʻUlaʻino. Handy and Handy (1972: 499), suggest the pre-Contact ahupuaʻa settlement in Keʻanae be considered as the archetype for general patterns of land use on the windward region of East Maui. The Keʻanae Ahupuaʻa settlement pattern is supported by the many documented heiau, house lots, agricultural architecture and soils, and archival/historic references. Thus it can be inferred that the traditional ceremonial activities, permanent and temporary habitation loci, and marine exploitation attributed to Keʻanae were common throughout this region. Agricultural activities would be undertaken on the upland plateau lands and within the valleys where permanent streams allowed for extensive loʻi construction.

Sterling (1998:116-117) recounts information J.C. Elliot presented to Kenneth P. Emory, in which Elliot provided a very detailed description of the location and contents of an undocumented "shelter" cave he visited in the gulch below Bridge #39, the ʻUlaʻino Bridge. [Note Sterling (1998: 116) does not disclose the date Elliot disclosed this information to Emory, but it was held sometime between 1957 and Emory's death on January 2, 1992]. Elliot described the cave as located below John Oliveira Jr.'s house (Figure 20) at approximately 440 ft. amsl. According to Elliot, the cave contained a low rock wall that appeared to have been constructed, pieces of a canoe (i.e., the left and right bow, right stern, right gunwale, and "fragments showing lashing holes"), two small fire hearths constructed of stone. Elliot (cited in Sterling 1998:177) stated:

> There are reported to be a number of other caves in the area but I looked into none of these, this particular one being the only one which appeared to have been inhabited until relatively recent times.

Figure 20: USGS Quadrangle (Hana, HI 1957; 1:24,000) Map Showing the Location of John Oliveira Jr.'s House.

WAHI PANA (LEGENDARY PLACES)

"Makaīwa" literally translates to "mother-of-pearl-eyes (as in an image)" (Pukui et al. 1974:140). The legend of Eleio is associated with East Makaīwa Ahupua'a. It is said that Eleio was:

> the caretaker [kahu] of Kakaalaneo, an Alii of Maui. and it is thought that Kakaalaneo was the fifth generation of Maui Chiefs… Eleio was a fast runner, and because of Eleio's speed, Kakaalaneo chose Eleio to fulfill his needs in very far places. [Pualewa 1863].

In A. Fornander's account of Eleio's exploits (cited in Sterling 1998: 109):

> It was said that when Kakaalaneo was ready for his morning meal he would order Eleio to go to Hana, in East Maui, and bring him some *awa*…In one of his trips to Hana, he met Kaahualii, a ghost, who lived in the wilderness of Oopuola. When the ghost met him, he asked that he be given some of the *awa*, but Eleio insulted him by telling him to take the hairs of his body and use it for his *awa*.

Fishing legends are also associated with the ahupua'a within the project area corridor in Ko'olau Moku. Moku Manu (cited in Sterling 1998:112) recounts a story of 'Ai'ai, a renowned fisherman and the son of Ku-ula, the Hawaiian god of the fishermen (Pukui and Elbert 1986: 187):

> 'Ai'ai…returned to Hana and lived at this birthplace quite a long time till he was a grown man. During this period he taught his art of fishing in all its forms; and when he was satisfied the people were proficient, he prepared to visit other places to teach his art. But before leaving Hana, 'Ai'ai told the friend he had appointed as head fisherman of Hana to go and kill the big he'e kupua (supernatural octopus) in the deep sea right off of Wailuanui, Ko'olau (west of Waiohue); and his friend consented.
>
> When the canoes were prepared and drawn to the beach and the people were ready to go, 'Ai'ai gave his friend the hokeo (gourd for fishing gear) in which the leho (cowry shell lure for catching octopus) his father had given him was kept. This shell is called Leho'ula ("Red cowry "), and Leho'ula in Hana was named after it.
>
> The people went in the canoes till they reached the pali near Kopiliula, where they rested. 'Ai'ai was not with them, but supervised their work from the pali of Puhiai. While resting, they prepared the leho for lowering, and when it was ready, 'Ai'ai's friend called on Ku'ula and Hina for the assistance of their mana kupua. Then he removed the covering of the gourd and took out the leho, which had rich beautiful colors like the rainbow; he attached it to a line and lowered it into the sea, where it sent out rays of fiery light.

> The he‘e was so attracted by the radiance that it came out of its hole and with its great arms, which were as long and thick as full-grown coconut trees, pushed up to the surface of the water and stood there like a coconut grove. The men were frightened, for the he‘e entered among the canoes, intending to destroy the canoes and the men and capture the leho; but it failed because ‘Ai‘ai’s friend, at the proper moment, shoved a stone he had brought into the head of the he‘e; and the weight of the stone drew the he‘e down to the bottom of the sea and kept it there; being powerless to remove the stone, the he‘e died.
>
> The men seized and cut off one of the arms; it was so big it loaded down all the canoes and they returned to Hana with just that one arm. The rest of the he‘e turned to stone and is pointed out today just outside of Wailuanui, where a stone formation resembles the body of a he‘e with one arm missing. When ‘Ai‘ai saw from the pali that his friend had succeeded in killing the he‘e, he returned to Hana; the canoes arrived shortly after him and the arm of the he‘e was divided among the people according to his directions.

HISTORIC PERIOD (POST-1778)

Although there appears to be a dearth of information about this area in Historic Period (post-1778), the J.C. Elliot account (cited in Sterling 1998:116-117) and Handy and Handy’s (1972:502) c. 1940 observations suggest occupation of the area continued into the twentieth century, but the lifestyle had changed and people were moving on:

> In 1954 there were about 10 houses still occupied in Lower Nahiku, and a small school in use. There were some Hawaiians and some Japanese. Apparently ranching was the only activity; we saw no taro or sweet potato patches, but there were some banana. A number of houses were abandoned and were falling into decay; others had been more recently vacated.

LAND COMMISSION AWARDS AND LAND GRANTS

The Office of Hawaiian Affairs online #5e Kipuka Database (2021) indicates Bridge #5, the Makanali Stream Bridge, is located within Land Grant 1396. There appears to be conflicting information on whether Land Grant 1396, comprised of 391.63 acres, was awarded to Luka and 10 others in 1854 (Kipuka Online Database 2021). Bridge #8, the Puohokamoa Stream Bridge, is located within Land Gran 2916, which is comprised of an undisclosed number of acres, awarded to Kekuahane et al. in 1863 (Kipuka Online Database 2021). No LCAs or Land Grants appear to have been awarded in close proximity to Bridge #19, the Puohokamoa Stream Bridge (Kipuka Online Database 2021). It appears that a portion of the Bridge #39, the ‘Ula‘ino Stream Bridge, project area may fall within a portion of Land Grant 8518-B:2, which was awarded to James Young Kanehoa, in 1855 (Kipuka Online Database 2021). According to J.C. Elliot (cited in Sterling 1998:116):

> [the land] remained in the Young family until the death of Queen Emma, and after her death, it was auctioned off, eventually coming into the hands of 20 Hawaiians by deed of Alex Cartwright.

TRADITIONAL DISTRICT OF HĀNA (MODERN DISTRICT OF HĀNA

Bridge #40, Mokulehua Stream Bridge, is located in ʻUlaʻino and Makapuʻu Ahupuaʻa, in the traditional and modern district of Hāna. Bridge #40 was constructed in 1908 and is positioned at MP 28.31 [TMK: (2) 1-2-003:001 por., 005; (2) 1-3-002:020 por. and 023 por.]. Additional potential staging areas include TMK: (2) 1-2-001:003 por. and (2) 1-2-004:005 por. Bridge #40 is situated 3.06 miles west of Alalele Place (Road to Hāna Airport), crossing over the Mokulehua Gulch (Figures 21 and 22). The geographic setting includes a rural residential area, a waterfall below the bridge and an open, wide terraced stream. This bridge is located 1.22 km (.75 mi) from the coast and is 840 ft. amsl.

CLIMATE

According to Giambelluca et al. (2013), this area receives a mean annual rainfall of 4,196.1 mm (165.20 in). The mean annual rainfall of 2,113.2 mm (161.94 in). The mean annual air temperature is 21.605 °C (70.89 °F) with a high of 23.08 °C (73.54 °F) in the fall and a low of 20.01 °C (68.02 °F) in the spring (Giambelluca et al. 2014).

SOILS AND VEGETATION

According to Foote et al. (1972: Sheet Number 127; Figure 23) soils within the vicinity of Bridge #40, the Mokulehua Stream Bridge, are comprised of Hana very stony silty clay loam (HKLD). This soil is on smooth, low mountain slopes. The surface layer is very dark grayish-brown silty clay loam about 12 inches thick. The subsoil is dark brown silty clay loam. The surface layer consists of a strong to medium acidity and the subsurface layer is slightly acidic. This soil has been used for pasture (Foote et al. 1972:37).

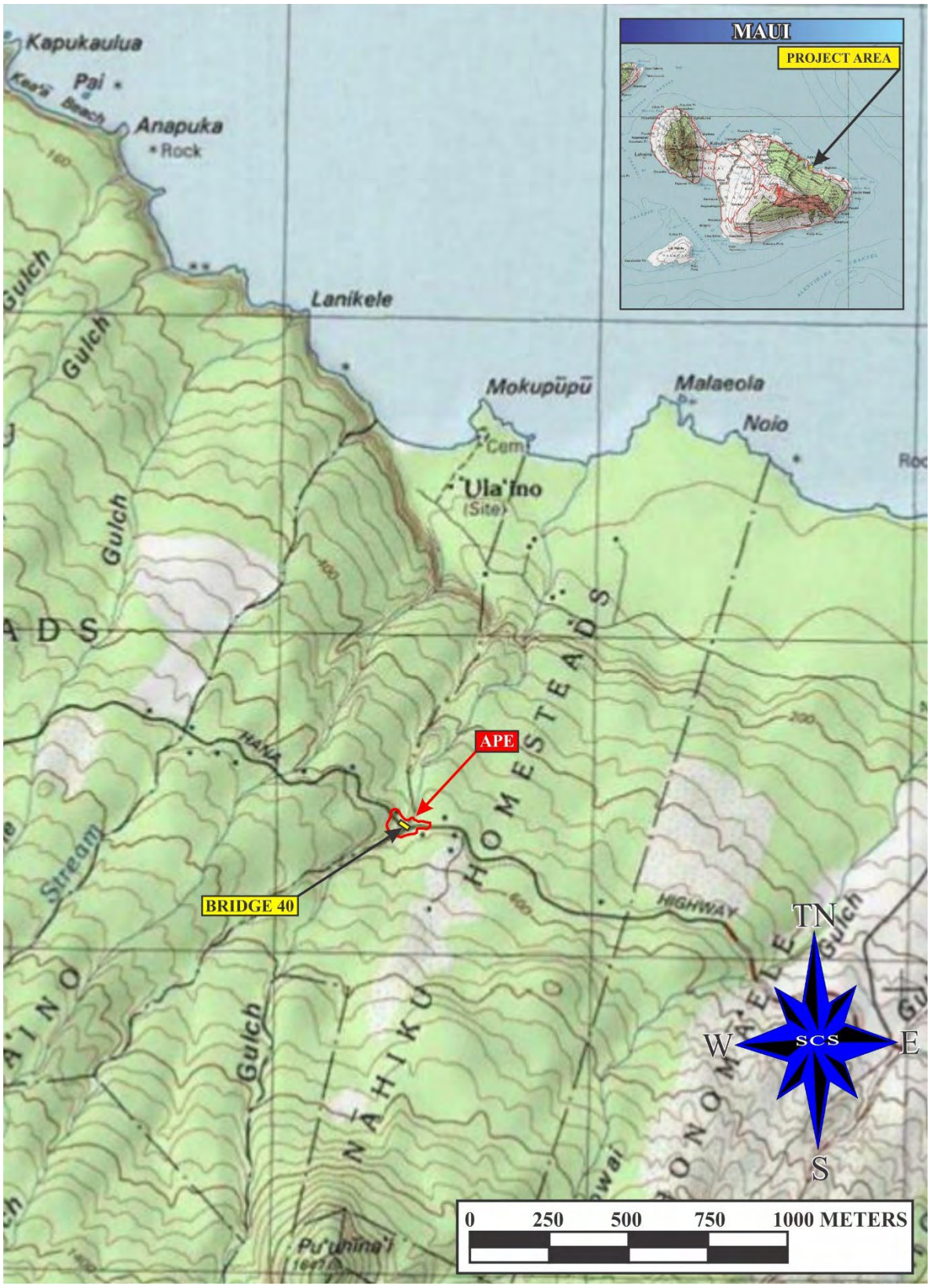


Figure 21: USGS Quadrangle (Hana, HI, 1983; 1:24,000) Map Showing Location of Bridge #40 (Mokulehua Stream Bridge).

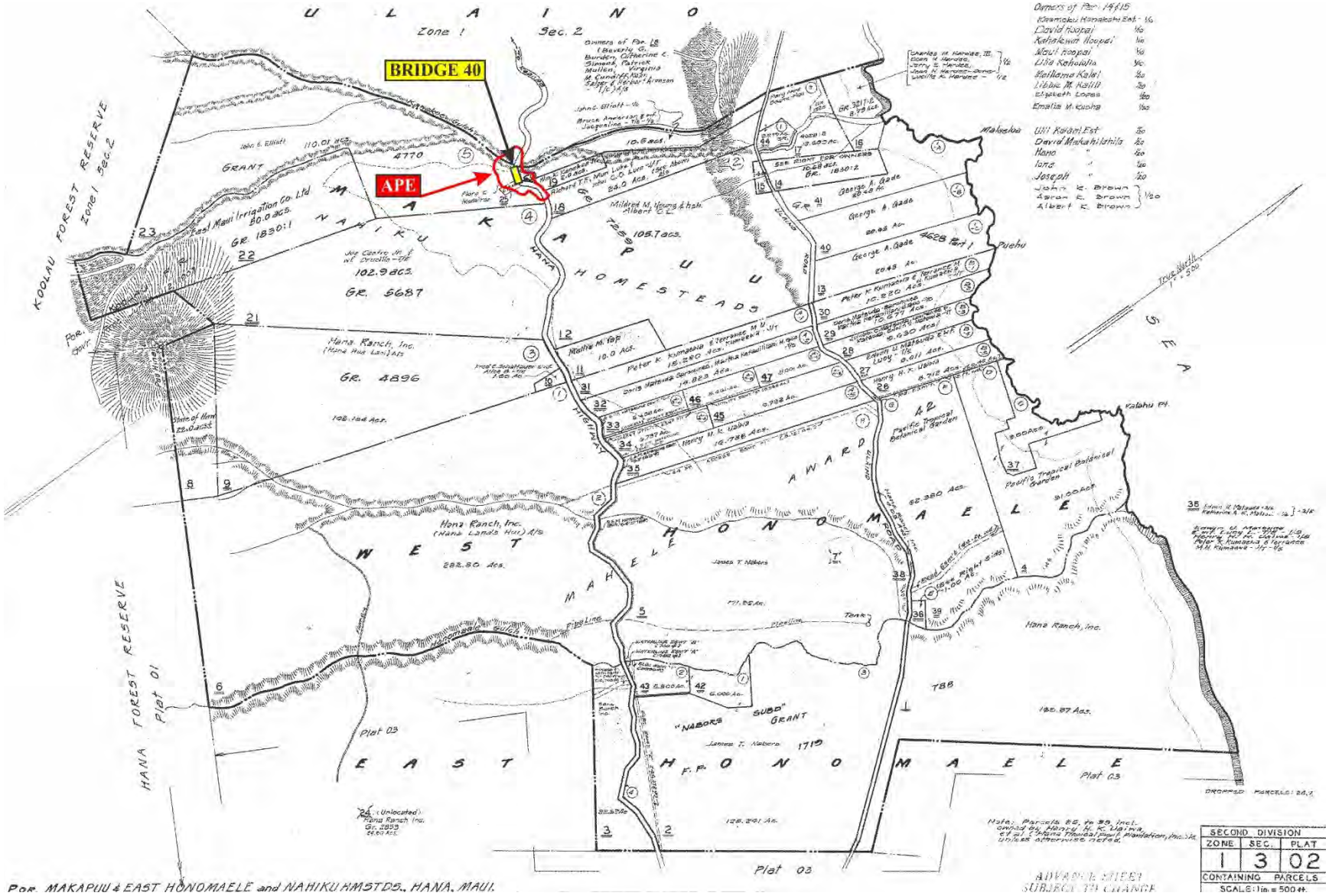


Figure 22: Tax Map Key [TMK: (2) 1-3-002] Showing the Location of Bridge #40 (Mokulehua Stream Bridge).

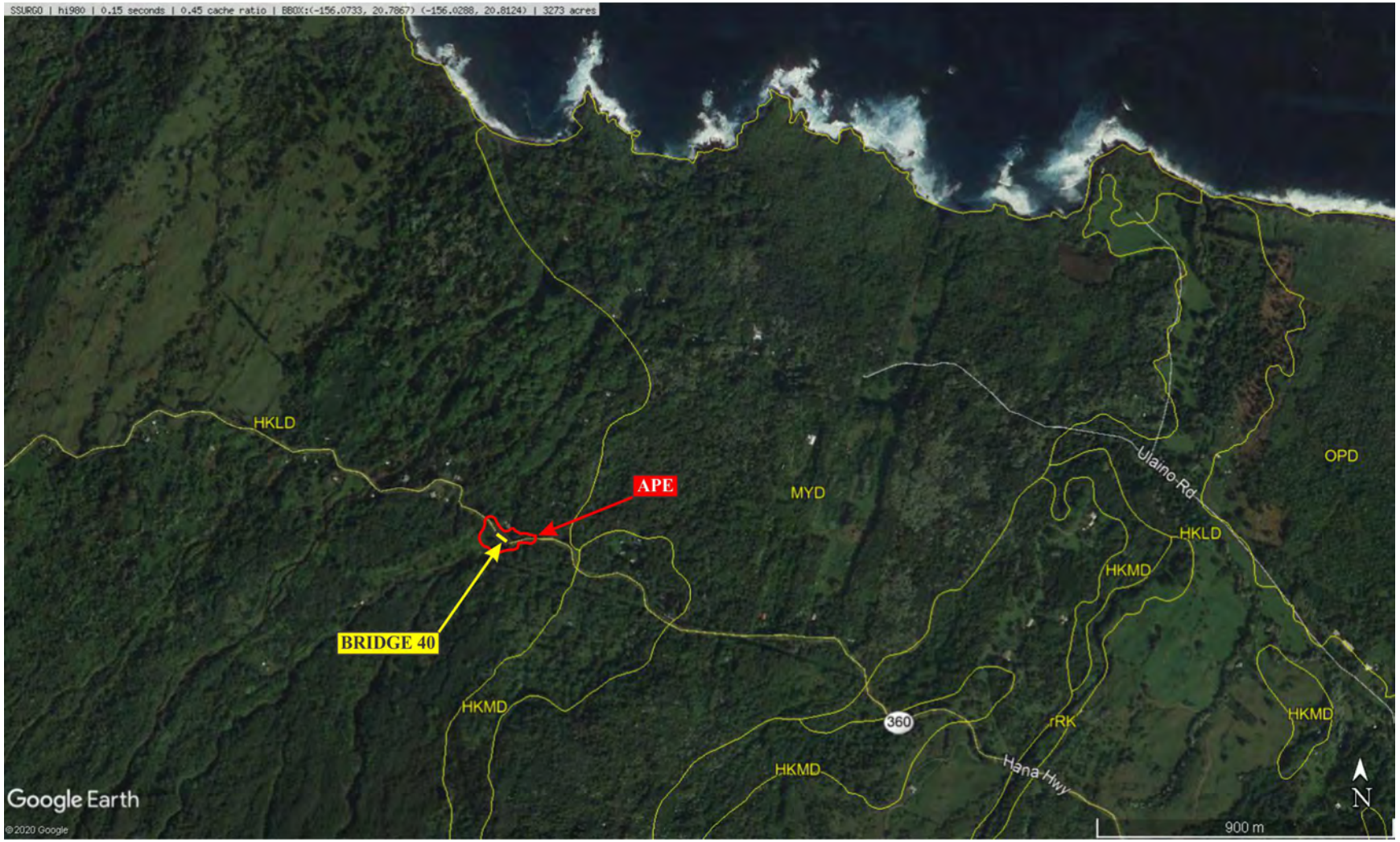


Figure 23: USDA Soil Survey (Foote et al.1972: Sheet Number 127) with Satellite Image (Google 2019) Overlay Showing Soil Types in the Vicinity of Bridge #40 (Mokulehua Stream Bridge) and APE.

TRADITIONAL AND HISTORICAL BACKGROUND

During the pre-Contact Period, the traditional district of Hāna was considered valuable for its strategic location, as well as for the productivity of its land and the sea. The fish ponds in ʻAleamai, Haneoʻo, and Hāmoa were not only able to support residing aliʻi and their entourage, but the natural fishing grounds and well-watered soils caused prosperity for its thriving community:

> Hāna [the district] was a fertile land where taro, sweet potatoes, bananas, sugar cane, and wild fruits grew in abundance, and there was always much food to be had. Kawaipapa was rich in fish from the ponds and from the sea.... (Kamakau 1961:25)

It was recorded that much of the land in Hāna had been former agricultural areas (Handy 1940, Sterling 1998:133–139). Taro was grown in Wananalua and Niumalu Ahupuaʻa, and sweet potato crops were being cultivated near the shoreline of Kaʻuiki Head. In Hāmoa, dry land taro was grown in ʻŌpae-kui Valley which also provided upland shrimp (Handy 1940).

Handy and Handy (1972:502) describe Hāna as:

> The farthest part of Maui on the very eastern end of Haleakala… [It is] one of the wettest and most verdant coastal areas in the Hawaiian Islands. It has no flatlands along streams; in the upper reaches there is much boggy land. Yet a great deal of upland taro was grown there, as well as bananas, yams, *wauke* and *olona*. Hana is famous for its ʻ*awa*.
>
> The coast line is very rough, but not high like that of the Koʻolau. There are rich level lands lying between the shore and the gently sloping *kula* land, which was, in the 1930's, planted with sugar cane, then later sold as ranch land.
>
> Hana Bay and its small volcanic hillock, Kaʻuiki, are famous in the annals of the *aliʻi* of Maui and Hawaii. This was due to a variety of causes…Perhaps an original cause was its closeness to the north coast of Hawaii. Alanuihaha Channel, between the southeast and south coast of East Maui and ʻUpolu Point (the northwest tip of Hawaii) could easily be crossed in either direction in a couple of hours when a trade wind was blowing. As a sanctuary, both in wartime and peacetime, Hana was an ideal seat for ruling *aliʻi* of either island, as well as a much pleasanter and more beautiful place in which to live.

According to Pukui et al. (1974:40), Kaʻahumanu, Kamehameha's favorite wife, was born in Hāna at a place called Pōnaha-ke-one.

MAKAPUʻU AHUPUAʻA

As ʻUlaʻino Ahupuaʻa is discussed above, this section will primarily focus on Makapuʻu Ahupuaʻa. "Makapuʻu" literally translates to "hill beginning *or* bulging eye" and refers to "the name of an image said to have been in a cave known as Ke-ana-o -ke-akua-pōloli" (Pukui et al. 1974:40).

WAHI PANA (LEGENDARY PLACES)

Hāna's political importance was noted in legendary and historical accounts which include the works of David Malo (1951), Samuel Kamakau (1961), John Papa ʻĪʻī (1959) and Abraham Fornander (1969), as well as the religious temples consecrated by paramount chiefs. Topographic and constructed features, such as Puʻu Kaʻiwi O Pele, Puʻu Kaʻuiki and Kekoʻona Fishpond in Wananalua reflect its connection with the gods, as does its choice as a residence for many of Maui's aliʻi (chief) such as Kaluanuiahua, Kamalalawalu, Lonikamakahiki, Piʻilani, Kāhapiʻilani, Kahekili, Kalaniōpʻu, Keʻeaumoku, and Kamehameha, to name a few (in Beckwith 1970:19–22, 379). Myths and legends reaffirm Hāna's sacredness. Many stories, including those concerning Kōʻula, the fish god; Pele, the fire goddess; the origin of Kauʻiki Hill; the fishing grounds of Kapukaulua; and the formation Alau Island, suggests Hāna had always been a place of favor (Sterling 1998:118–155).

Moses Manu (1899 cited in Sterling 1998:119) recounts a legend describing what may have been Pele's "very first experience in going under the earth from Hale-a-kala to the northwestern side of the peak of Ka-ihu-a-ka-la (The-sun's-nose)" and references Kaʻelekū (the basaltic rock) Ahupuaʻa:

> On the northwest side of it is another peak called Hale-o-Pele…from there Pele caused a flow to pour as far as Ka-wai-papa, Wakiu, Hono-ka-lani, Kaʻeleku, and between Honomaʻele and Makapuʻu in Ulaino. Between these places is the lava bed of Akiala, a place well known in the olden days as the haunt of robbers. The stone (on Akiala) lies on the upper side of the road that runs from Hana to Koʻolau. The hills of Olopawa lie above Kaʻeleku and were made by the lava. So was the hill of Hinaʻi, above ʻUlaʻino, close to Ke-ala-kona where the image (Kawalakii) of ʻohia wood was set up on the fortress of Kaʻuiki. The image made during the reign of Kamalalawalu [Kihapiilani's son with his first wife, Hana chiefess Kumaka] and on this hill remained the defenders of the land. The famous war leaders of Maui, according to old accounts, were Kaikipaʻanaea, Hoʻolaemakua, and Mahihelelima. It is also the very same hill on which the young chief, Peʻapeʻa was destroyed by the exploding of the powder of the heartless.

HISTORIC LAND USE

The sugar industry appeared early in Hāna, between 1849 and 1859. A Mr. Lindgren constructed a small mill on the flats of Haneoʻo-Hāmoa, *makai* of the Hāna Highway, and began cultivation of around 60 acres of cane. The Hāna Plantation, begun in 1851 by George Wilfong, was one of the first commercial sugar plantations in Hawaiʻi. By 1861, more land consolidation and general improvements, including a railroad, had occurred, and the whole operation had a new owner, August Unna. Many small LCA and grant owners also cultivated cane and then sold it to the mill. An extensive wall system was constructed, establishing boundaries and protecting the agricultural crops from the rising encroachment of grazing cattle. The Hāna Plantation was purchased by a Mr. Grinbaum in 1889, combining them with previously obtained sections, and thus forming the Hāna Plantation Company (Condé and Best 1973). In turn, Theo H. Davies and Co. assumed ownership of the plantation in the early 1900s, absorbing small LCA holdings and changing the name to Kaeleku Sugar Co. Once again, a change in ownership occurred when C. Brewer & co. obtained possession in 1933, but by 1945, the plantation was closed and liquidated (Condé and Best 1973).

Archival research indicates the settlement pattern in the Hāna District was one of dispersed households living and farming within a relatively narrow coastal zone (0–600 ft. amsl), at this time. As the importance of commercial sugar increased, valuable land was absorbed into the plantation and the population shifted – small land holdings were sold and settlement concentrated around the mill and port of Hāna (Kameʻeleihiwa 1992:309). Wilfong imported laborers from other countries, beginning with the Chinese in 1852, to maintain the sugar crops, further altering the traditional lifestyle. It should be noted that the 1946 tsunami inundated much of the coastal region, affecting the old Hana Airport and any other low-lying area within the Hāna District. Presumably, past tsunami also impacted the land. Most of the land surrounding the present project route was planted in sugar. The Hana Airport, and associated buildings, was constructed in 1951 from surplus material at Maui Airport (Puunene). The airport was remodeled in 1955. Construction included a wood frame consisting of stud walls and a double pitch roof and ʻohia columns were placed along the perimeter of the lanai space.

RANCHING

Livestock was introduced to the Hawaiian Islands in 1793 when Captain Vancouver transported cattle and sheep aboard his ship the *Discovery* with the intention of giving the four cows, two bulls, four ewes, and two rams to Kamehameha I as a gift of goodwill. Cattle were on the Island of Maui by1806. Amaso Delano (in Brennan 1995:97) provides the following account of the effect cattle had on traditional life on Maui:

> They had recently brought to this island, one of the bulls the Captain Vancouver landed at Owhyee (Hawaii). He had made very great destruction amongst their sugar cane and gardens, breaking them and their cane patches and tearing them to pieces with his horns and tearing them with his feet. He would run after and frighten the natives and appeared to have the disposition to do all the mischief he could, so much so that he was an unwelcome guest among them.

As sandalwood and koa were diminishing, cattle became an important resource to the Hawaiian economy. By 1820, the number of cattle had increased to such a degree they were aggressively being hunted for their hides. In addition, their tallow and meat became important commodities of local and international trade. Soon cattle and their importance in the trade industry flourished to such an extent that Hawai‘i became a major supplier of beef to California during the Gold Rush and subsequently to the visiting whaling ships, as well (Cowan-Smith and Stone 1988:6). Around 1945 or 1946, Paul Fagan, one of the new owners of the Hāna Plantation Company, shifted land use from cane to cattle pasture and began building a small Hotel in Hāna (Kolb et al. 1993). Mr. Fagan purchased 14,000 acres of Hāna land and utilizing some of the plantation lands to raise cattle, began the Hāna Ranch (Cleghorn and Rogers 1987:12).

LCAS AND LAND GRANTS

No LCAs appear to be in close proximity to Bridge #40, Mokulehua Stream Bridge. However, the bridge does appear to be located within Land Grant 1830 (see Figure 22). According to the Office of Hawaiian Affairs Online Kipuka Database (2021), under Land Grant 1830, a portion of the 61.5 acres award was granted to Opuni and Pali in 1855. No information was available for Land Grant 4770 in the vicinity of Bridge #40 (Office of Hawaiian Affairs Kipuka Database 2021).

CONSULTATION

The consultation process is conducted via telephone, e-mail, the U.S. Postal Service, and virtually. SCS conducts in-person interviews, whenever possible. Due to the current COVID-19 pandemic, interviews were conducted by telephone or virtually, via ZOOM, for everyone’s health and safety. No in-person interviews were conducted for this CIA. The initial letters of inquiry, an example of which is presented in Appendix A, were mailed between August 19, 2020 and November 30, 2020. Information pertaining to cultural resources and traditional cultural practices conducted within the project area or within the ahupua‘a of Pu‘uomāile, Pāpa‘aea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ‘Ula‘ino, and Makapu‘u, located in the Districts of Makawao (Hāmākualoa) and Hāna (Ko‘olau and Hāna), Island of Maui, Hawai‘i, was sought from the following fifty-eight (58) individuals and organizations.

1. Brian Kaniela Naeʻole, descendant
2. Thelma Shimaoka, Community Outreach Coordinator III, Office of Hawaiian Affairs
3. Roy Newton, Office of Hawaiian Affairs
4. Albert Perez, Executive Director, Maui Tomorrow Foundation
5. Maui Sierra Club
6. Patty Nishiyama, Nā Kupuna O Maui
7. Kamika Kepa`a, Native Hawaiian Preservation Council
8. Mr. William Hoʻohuli, community member
9. Kai Markell, Compliance Manager, Office of Hawaiian Affairs
10. Bob Hobdy, Environmental Consultant
11. Torrie Nohara, Na Ala Hele Program, Department of Land and Natural Resources Division of Forestry and Wildlife
12. Keʻeaumoku Kapu, CEO, Aha Moku O Maui, Inc.
13. Leimana DaMate, Executive Director, Aha Moku Advisory Committee, State of Hawaii,
14. Chris (Ikaika) Nakahashi, Cultural Historian, State Historic Preservation Division
15. Andrew (Kealana) Phillips, Burial Sites Specialist, State Historic Preservation Division
16. Kumu Hōkūlani Holt, Director, Ka Hikina O Ka Lā, Hawaiʻi Papa o Ke Ao, University of Hawaii Maui College
17. Lucienne de Naie, President, Maui Tomorrow Foundation
18. Kumu Kīʻope Raymond, Formerly of Hawaiian Studies Program, Department of Humanities, University of Hawaii, Maui College
19. Dr. Scott Fisher, Chief Conservation Officer, Hawaiʻi Land Trust; Maui/Lānaʻi Burial Council Representative; and Former Associate Director of Conservation, Hawaiian Islands Land Trust
20. Dr. Kaleikoa Kaʻeo, Hawaiian Studies Program, Department of Humanities, University of Hawaii, Maui College
21. Tammy Luat-Hueu, community member

22. Dawn Lono, Executive Assistant, Councilmember Shane Sinenci, Hāna District Representative, Maui County Council

23. Shane Sinenci, Hāna District Representative, Aha Moku o Maui and Hāna District Representative, Maui County Council

24. Kyle Nakanelua, Maui Poʻo- Moku O Kahekili, Aha Moku Advisory Council

25. Blossom Feteira, Maui Mokupuni Council

26. Kapulani Antonio, Former Chairperson, Maui/ Lānaʻi Island Burial Council

27. Dane Maxwell, Chairperson, Maui/ Lānaʻi Island Burial Council

28. Annella Amaral, President, Association of Hawaiian Civic Clubs

29. Scott Crawford, Chairperson, Ke Ao Haliʻi and community member

30. Manuel Kuloloio, descendant

31. Leinaala Vedder, descendant

32. Mahealani Wendt, Na Moku Aupuni O Koʻolau Hui

33. Robert Hill, Archaeologist

34. John Blumer-Buell, community member, former member of the Hana Advisory Committee

35. Christel Blumer-Buell, community member

36. Moke Bergau, community member

37. Loly Soler-Bergau, community member

38. Terry Kristiansen , community member

39. Teresa Allred, community member

40. Bruce Stoner, community member

41. Jeffrey C. Paisner , community member

42. Irene Pavao, community member

43. Ellen Kahookele, community member

44. Sharon Kahookele, community member

45. Jean Mary Kahookele, community member

46. Brad (last name unknown), community member

47. Russell Stoner, community member

48. Russell Kahookele, community member

49. Anna Dickison , community member

50. Mapu Kekahuna, Kumu Kamalu, Nahiku Community Association

51. Ashley K. Obrey, Hawai‘i Island Attorney, Native Hawaiian Legal Corporation

52. Mahealani Cypher, descendant

53. Dr. Ward Mardfin, community member

54. Kau‘i Kanaka‘ole, Executive Director, Ala Kukui Hāna Retreat, and community member

55. Harolen Kaiwi, community member

56. Ipo Mailou, community member

57. Josalind Akoi, community member, Hāna District member of Aha Moku o Maui

58. Sam Akoi, descendant

59. SHPD has been consulted for the 6E process and Section 106

The follow-up letters of inquiry, an example of which is presented in Appendix C, were mailed via e-mail and USPS between October 29, 2020 and December 14, 2020. Follow-up letters were mailed to all the above listed individuals and organizations, with the exception of those individuals and organizations that submitted responses to SCS.

A Cultural Impact Assessment Notice was published in the September 2020 issue of the OHA newsletter, Ka Wai Ola (see Appendix B). This notice stated that Scientific Consultant Services, Inc. is seeking information on cultural resources and traditional cultural activities in the vicinity of the six historic bridges along Hāna Highway. The notice identified of all of the bridges, streams, ahupua‘a, and provided locational information (i.e., the ahupua‘a, traditional and modern names of the District, Island, State, and property Tax Map Key designations). The notice also states Hāna Belt Road is designated as State Inventory of Historic Places (SIHP) State Site # 50-50-va-01638. In 2001, the Hāna Belt Road was added to the National Register of Historic Places (National Register Reference # 01000615).

RESULTS

The current consultation process for the Hāna Highway Bridge Improvement Project resulted in SCS receiving responses from seventeen individuals via e-mail and conducting one telephone interview, with ZOOM visuals, was conducted due to the on-going COVID-19 pandemic. Based on these responses and interviews, assessment of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

WRITTEN RESPONSES

Scientific Consultant Services, Inc. received sixteen (16) written responses to our queries. The written responses are presented below.

BLOSSOM FETEIRA, MAUI MOKUPUNI COUNCIL

Blossom Feteira responded via two emails dated August 20, 2020:

> Aloha Cathy;
>
> My knowledge of the area is non-existent. Sorry about that. But what I can do is forward your email to members of the Hana Community Who may be more able to assist you in this area. Will check with them to see if they are willing and will shoot them this email.
>
> Will let you know how that comes up.
>
> Aloha, Blossom

And:

> Aloha Cathy,
>
> Forwarded your email to Hana people. They were very interested in participating.
>
> Good luck.
>
> Blossom

Concerns: No concerns were expressed by Ms. Feteira in either email. However, Ms. Feteira kindly forwarded SCS's consultation materials to the appropriate Hāna families.

BOB HOBDY, ENVIRONMENTAL CONSULTANT

Bob Hobdy responded via an email dated August 21, 2020:

Aloha Cathy,

I can share some of my manaʻo regarding the resources and the kamaʻaina of the Hamakualoa, Koʻolau and Hana moku from my experiences working for the Division of Forestry from 1962 to 2002. The Hana Highway, as we know it, was constructed between 1910 and 1912. Before that, traveling along this windward coast was done on foot along the Alanui o Piʻilani. People were scattered along this coast in the many ahupua'a. The population was small because the steep and rugged terrain offered little arable land. Almost all villages were in valley bottoms along the coast. The people relied on ocean resources, some kalo lo'i in the larger valley bottoms, stream resources such as ʻoʻopu, hihiwai and ʻopae kalaʻole and forest resources such as Mai'a, awa, ulu,ʻohe ʻohia ʻai and various wood, stone and medicinal plants. Some of the traditional kupuna were still around that could tell of the days when their families lived off the land and ocean and what life was like. These kupuna are all gone now, but some of their descendants still carry on some of their practices. The alanui still can be found, mostly makai of the Hana Highway but it is overgrown by jungle growth.

The six bridges are located along perennial streams that have steep gradients and numerous waterfalls. Most of the stream life does not get up to the elevations of the bridges (with the exception of the ʻopae kalaʻole and the oʻopu hiʻu kole). I am aware of the current gathering of the ʻopae kalaʻole only from the streams above Puaʻakaʻa State Park but not from any of the streams at the named bridges. The ʻoʻopu hiʻu kole is not considered to be one of the edible ʻoʻopu and is not gathered.

An excellent source of kupuna interviews is "A Cultural-Historical study of East Maui – The Uplands of Kalialinui and the Lands That Lie Below, Island of Maui." 2006. By Kepa and Onaona Maly. This captures some of the stories of the old timers I was referring to.

I hope this is useful. Bob Hobdy

Concerns: Mr. Hobdy did not express any concerns in his email. Nor did Mr. Hobdy identify any traditional cultural practices or cultural resources in the vicinity of the six bridges or their surrounding environs.

CHRIS (IKAIKA) NAKAHASHI, CULTURAL HISTORIAN, STATE HISTORIC PRESERVATION DIVISION

Mr. Nakahashi provided the following response via an e-mail dated August 27, 2020:

Aloha Cathy,

Mahalo for contacting me regarding the Cultural Impact Assessment for the proposed Hana Bridges Improvements project in the ahupuaʻa of Puʻuomāile, and Pāpaʻaea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu, Hāmākualoa and Koʻolau Districts, Maui.
I recommend SCS to utilize the media (e.x. OHA's Ka Wai Ola, Maui News, Maui Times, etc.) to solicit additional information for this CIA.
I recommend SCS minimally to meet with:

- Keʻeaumoku Kapu – ʻAha Moku o Maui Inc.
- Na Moku Aupuni O Koʻolau Hui

I recommend SCS to meet with the native tenants and people that currently live or previously lived in the ahupuaʻa listed above on Maui for information about the cultural resources and practices for this CIA.
Please let me know if I can assist with anything else.
A hui hou,

Christopher "Ikaika" Nakahashi, M.S.
Cultural Historian
Department of Land & Natural Resources
State Historic Preservation Division

Concerns: While Mr. Nakahashi did not identify and traditional cultural practices or cultural resources, he did suggest SCS contact Keʻeaumoku Kapu (CEO Aha Moku o Maui Inc.) and Na Moku Aupuni O Koʻolau Hui, in addition to posting a newspaper notice.

Note: SCS contacted Mr. Kapu, via two letters sent via email dated August 20, 2020, and October 30, 2020. To date, Mr. Kapu has not responded. SCS contacted Na Moku Aupuni O Koʻolau Hui, via two letters transmitted via USPS. To date, Na Moku Aupuni O Koʻolau Hui has not responded.

DANE MAXWELL, CHAIRPERSON, MAUI/ LĀNAʻI ISLAND BURIAL COUNCIL

Chairperson Maxwell responded to SCS's query via an email dated August 24, 2020:

> Aloha e Cathy,
>
> Yes, we are all doing maikaʻi here at the Maxwell house. I hope that you and yours are healthy and happy as well.
>
> I will take a look and also forward this email to our Hāna representative Mr. Kyle Nakanelua.
>
> mālama,
>
> Dane Maxwell

Concerns: Chairperson Maxwell did not provide any concerns about potential impacts to cultural resources or traditional cultural practices in his email.

DR. SCOTT FISHER, CHIEF CONSERVATION OFFICER, HAWAIʻI LAND TRUST; MAUI/LĀNAʻI BURIAL COUNCIL REPRESENTATIVE; AND FORMER ASSOCIATE DIRECTOR OF CONSERVATION, HAWAIIAN ISLANDS LAND TRUST

Dr. Fisher responded to SCS's query via an email dated August 20, 2020, suggesting SCS contact

> …Ke Ao Haliʻi. They are a local Hana community working to preserve historic and cultural sites. We are working with them to protect the coastline along Hana, and recently protected a location known as Mokae, next to Hamoa beach. Their contact person is Scott Crawford…. He is a great guy, and very knowledgeable, and he could probably easily put you in contact with others who can shed light on the history of the project area. Let me know if you would like to talk, as I am always happy to do so.
>
> Mahalo
>
> Scott

Concerns: Dr. Fisher did not relate any concerns, in his email, pertaining to potential impacts to cultural resources or traditional cultural practices his email. Dr. Fisher graciously agreed to be interviewed for this report. His interview is summarized in the Interview section of this document.

Note: SCS followed up on Dr. Fisher's suggestion to contact Scott Crawford, Chairperson, Ke Ao Haliʻi. Mr. Crawford's comments are presented

SCOTT CRAWFORD, CHAIRPERSON, KE AO HALIʻI AND COMMUNITY MEMBER

Chairperson Crawford responded to SCS's query via an email dated September 31, 2020:

> Aloha Cathy,
>
> I am not personally familiar with the information regarding these particular bridges, but I am able to put out a more broad inquiry for community input if you would like, via my Hana email list.
>
> If you haven't already been in touch with them, I would also recommend contacting:
>
> Ward Mardfin
> Kauʻi Kanakaʻole
> Harolen Kaiwi
> Dawn Lono
> John Blumer-Buell

Concerns: Chairperson Crawford did not mention any concerns regarding potential impacts to cultural resources or traditional cultural practices his email.

Note: SCS followed up on Chairperson Crawford's suggestion and contacted Ward Mardfin, Kauʻi Kanakaʻole, Harolen Kaiwi, Dawn Lono, and John Blumer-Buell. To date, SCS has received responses from Dawn Lono and Kauʻi Kanakaʻole. Their responses are presented below.

DAWN LONO, EXECUTIVE ASSISTANT, COUNCILMEMBER SHANE SINENCI, HĀNA DISTRICT REPRESENTATIVE

Dawn Lono was very helpful and responded via several emails dated November 9, 2020. In her initial email, Ms. Lono stated:

> Aloha Cathy –
>
> I have compiled a list and am sending an email to each one to ask permission to share their information and if they are interested in this subject matter. Once I receive their replies I will forward their contact information. Is that ok. Hopefully can have it to you by tomorrow, 11/10/2020.
>
> Dawn

In Ms. Lono's subsequent emails, she kindly forwarded SCS's consultation materials to Kumu Kamalu, Mapu and the members of the Nahiku Community Association, Mahealani Wendt and the members of the Na Moku Au Puni O Ko'olau Hui, Kauʻi Kanakaʻole, and Sam Akoi. With the exception of Sam Akoi, SCS followed up with each of these individuals and organizations via emails. Mr. Akoi called the SCS, Honolulu office on November 18, 2020, and left a message. SCS returned Mr. Akoi's calls on November 19 and 20, 2020, but was unable to reach him. To date, SCS has not received responses from Kumu Kamalu, Mapu or the members of the Nahiku Community Association, Mahealani Wendt or the members of the Na Moku Au Puni O Ko'olau Hui.

Concerns: Ms. Lono did not express any concerns about potential impacts to cultural resources or traditional cultural practices in any of her emails.

KAUʻI KANAKAʻOLE, EXECUTIVE DIRECTOR, ALA KUKUI HĀNA RETREAT, AND COMMUNITY MEMBER

In an email dated December 3, 2020, Ms. Kanakaʻole stated:

> Hi Cathy,
>
> In looking over the sites, nothing pops up at me as significant in terms of cultural practice. Hope the project goes smoothly.
>
> Kaui
>
> Kauʻi Kanakaʻole
> Executive Director, Ala Kukui Hāna Retreat

Concerns: Ms. Kanakaʻole did not express any concerns about potential impacts to cultural resources or traditional cultural practices her email.

KUMU HŌKŪLANI HOLT, DIRECTOR, KA HIKINA O KA LĀ, HAWAIʻI PAPA O KE AO, UNIVERSITY OF HAWAII MAUI COLLEGE

Kumu Hōkūlani Holt responded via an email dated August 20, 2020:

> I do not have personal information about those areas. There are others that are more knowledgeable than me about these areas.
>
> ʻO au iho nō,
> Hōkūlani

Concerns: Kumu Holt did not express any concerns about potential impacts to cultural resources or traditional cultural practices her email.

KUMU KĪ‘OPE RAYMOND, FORMERLY OF HAWAIIAN STUDIES PROGRAM, DEPARTMENT OF HUMANITIES, UNIVERSITY OF HAWAII, MAUI COLLEGE

Kuku Raymond responded via an email dated August 20, 2020:

Concerns: Kumu Raymond did not express any concerns about potential impacts to cultural resources or traditional cultural practices his email.

LUCIENNE DE NAIE, PRESIDENT, MAUI TOMORROW FOUNDATION

Ms. ds Naie provided the comments presented below via an email dated October 11, 2020:

[Please note that all bolded print and all print in red font is Ms. de Naie's not SCS's]..

Aloha Cathy

This appears to be an extensive project in a very culturally sensitive [sic] zone.
Is this CIA part of an EA or EIS? Really seems like that would be good to have.
The maps don't give much in the way of details.

Do you have any info on how much work is planned on the bridges?
Are any of them planned to be replaced?

It appears from the maps you sent that work is proposed for the bridges on:

Kailua stream/Hana Highway
Makaiwa/O‘opuula stream /Hana Highway
Puohakamoa Stream/ Hana Highway
Kopiliula stream/Hana Highway

Karaoke stream/Hana Highway (east of Nahiku)
Kakam‘ole stream/Hana Highway (east of Nahiku)

I am personally familiar with cultural resources at several of these locations: Kailua stream; Makaiwa area/O‘opu‘ula streams / Puohakamoa stream/ Kopili‘ula stream.

Native Hawaiian legal Corp should be contacted.
Their clients in Nahiku and Ke‘anae/Wailua nui use many of these streams.

A community meeting should be held to share knowledge about cultural practices. Even if it needs to be partly online.
Internet service is kind of spotty in Est Maui except for Hana Town, but it should be possible to do something.

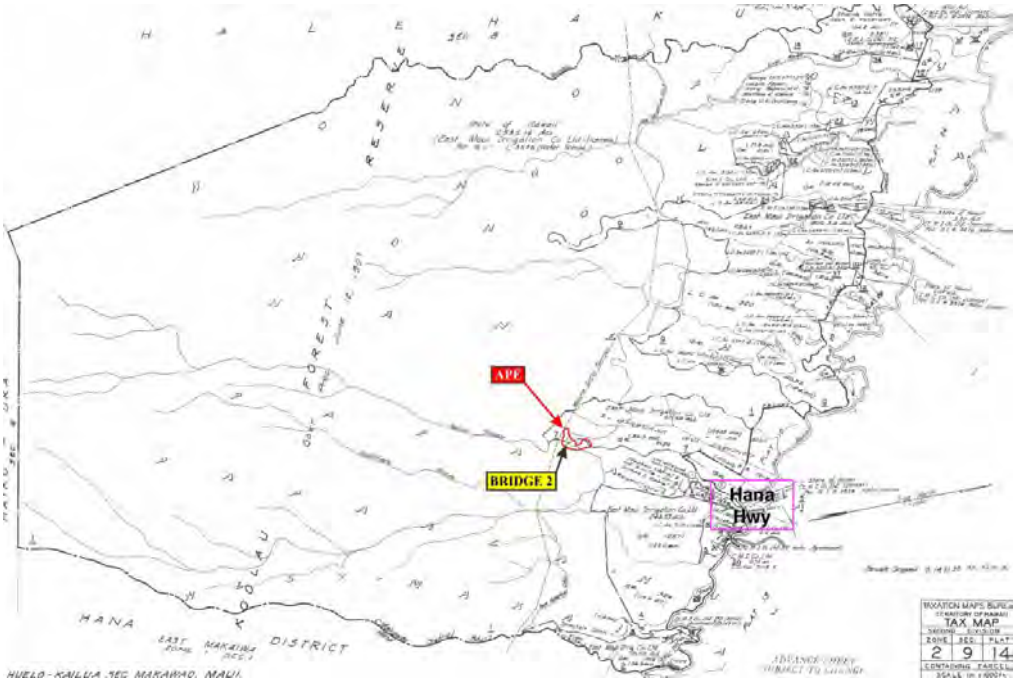
This is big deal to do work on 6 bridges.

Nahiku folks should be made aware of plans for Nahiku-Ulaino area bridges & Kopili‘ula Bridge.

I cced Mapu Kekahuna who has been active with Nahiku Community association

There is very active cultural use by Hawaiian families of the lands around Makaiwa/O‘opuola and Puohakamoa streams near Hana Highway.
I have cced some folks working with those ‘ohana.

One of the maps (TMK map attached) has incorrect location for bridge 2 /
It shows work being proposed up in the Koolau Forest zone on Papa‘anui Rd, while the other map (USGS TOPO) has the correct location, on Hana hwy.
I marked Kaikua stream/Hana hwy location on this map.



Concerns: While Ms. de Naie did state in her email that the project areas are culturally sensitive, she did not elaborate. Ms. de Naie was kind enough to forward SCS’s query to the Nahiku Community Association

Note: SCS also followed up with Mapu Kekahuna, Kumu Kamalu, Nahiku Community Association, but did not receive a response. As stated elsewhere in this document, SCS contacted John Blumer-Buell, community member, former member of the Hana Advisory Committee, but did not receive a response. SCS also followed Ms. de Naie’s suggestion and corrected the TMK map (see Figure 6). SCS followed up on Ms. de Naie’s suggestion to contact the Native Hawaiian Legal Corporation. Their comments are presented below.

ASHLEY K. OBREY, HAWAI'I ISLAND ATTORNEY, NATIVE HAWAIIAN LEGAL CORPORATION

Ashley K. Obrey responded via an email dated November 16, 2020:

> Aloha Cathy,
>
> We received your inquiry about the Cultural Impact Assessment you are preparing for the Hana Bridges Improvements project. My apologies for the late response…I just received your follow up email today.
>
> I have attached a couple of things that may be useful: (1) an oral history of East Maui by Kumu Pono Associates; and (2) the 2018 Decision and Order of the Commission on Water Resource Management re amending interim instream flow standards for 27 East Maui streams, which includes references to the cultural studies completed in the four license areas that include Hana. Have you reached out to the Office of Hawaiian Affairs' Kai Markell? His division keeps track of cultural studies and practices in the area, so he would be good to reach out to. In any case, OHA should be consulted as part of this assessment.
>
> I will follow up with you if I am able to connect you with additional resources.
>
> Mahalo!
>
> Ashley K. Obrey
> *Hawaii Island Attorney*
> Native Hawaiian Legal Corporation

Concerns: No concerns were expressed by Ms. Obrey and she did not identify any cultural resources or traditional cultural practices in the area. However, Ms. Obrey did suggest SCS contact Kai Markell, Office of Hawaiian Affairs.

Note: SCS initially contacted Kai Markell, Compliance Manager, Office of Hawaiian Affairs, via a letter, transmitted via USPS, dated August 25, 2020, and a via a second letter, also transmitted via USPS, dated October 30, 2020. To date, Mr. Markell has not responded.

ROBERT HILL, ARCHAEOLOGIST

Mr. Hill responded to SCS's query via an email dated September 16, 2020, in which he generously contributed a section of the Folio and Hill (2015) literature review report for Hāna Highway:

> Hana Bridges Preservation Project
> Hawaii Department of Transportation
> Archaeological Literature Review for Hana Highway, Route 360
> Prepared by CSH for Fung Associates
> September 2015
> Katie Folio
> Robert Hill
>
> Cathy,
>
> The report referenced above by our company can be accessed as an Appendix to the Hana Highway Improvements Plan online. All of the info in the report is up to date. Much of the cultural background was accessed directly from the sources of the historian Abraham Fornander in his three-volume "Memoirs of the Bishop Museum, Volume IV, V and VI," with additions, where appropriate by Samuel Kamakau and David Malo (from Malo's retranslated edition by Malcolm Chun, in 1996.) The *heiau* of the Hana region are discussed in some detail by Inez Ashdown, in her book, "Ke Alaloa O Maui" (1971).
>
> Anyway, there is a map I got from the cartographer for HC&S Company before they went under.
>
> [See next figure] It is as pure a map of Hamakualoa with the LCA boundaries shown, as I have ever seen. The original was India-ink on paper and was in horrific shape (as an archivist might say). The map had been attacked by insects. I got it scanned at HONBLUE on Maui, before it went into a crypt at A&B. I estimate it to be about 1885, as it appears to have info in it from the work of someone updating the Boundary Commission work of the 1850s. Possibly the surveyor Erdwin D. Baldwin – who I know did the re-survey work in upper Kula [Kamaole Mauka] and Kanaio in the 1880-1884 period. Anyway, this is a scan from the original artwork. So, if you are looking for additional LCA info –this may help. Credit should go to A&B Company, if you do reproduce a part of the map.


MAP
OF
HAMAKUALOA.
MAUI.

More on the surveys of East Maui can be found in "Mapping the Lands and Waters of Hawaii," the Moffat-Fitzpatrick book about the re-survey work and soundings work in the inter-island channels by W. D. Alexander and his band of surveyors. Some of the correspondence of the original surveyors, such as Erdwin Baldwin's, is at the State Archives. I know Erdwin Baldwin finished his work at Kanaio (South Maui) in 1884, so I'm ASSUMING he went to Hamakualoa around 1885 to work on these boundaries, because he would have had access to the original work done in the 1840s-1850s, when the original Mahele work was done. On the other hand, Dodge did the surveys for the Koolau District in 1878-1879. S.M. Kanakanui finished the surveys for Hana in 1894. So, I'm still thinking Erdman Baldwin worked on the boundaries along the routes of the irrigation ditches in Hamakualoa, and produced this map. It looks like his writing. Or, I could be wrong and this is all Dodge's work, which was finished later by Kanakanui.

The background of the Protestant missionaries in this region is from the "Missionary Herald" annual reports by the American Board of Commissioners for Foreign Missions at Boston. Even with this source, there was really scant info about the goings-on at the Hana Station. It wasn't until 1837 that Conde and Ives arrived at Hana, and another year before the Wananalua Church was built.

Concerns: Mr. Hill did not express any concerns about potential impacts to cultural resources or traditional cultural practices his email.

TERESA ALLRED, COMMUNITY MEMBER

Teresa Allred responded to SCS's query via an email dated November 13, 2020:

Cathy,

I respect you asking for input on this project. I have not lived her long enough to have an opinion on this project. So, I bow my head to the elders.

Respectfully,

Teresa

Concerns: Ms. Allred id not express any concerns about potential impacts to cultural resources or traditional cultural practices her email.

TORRIE NOHARA, NA ALA HELE PROGRAM, DEPARTMENT OF LAND AND NATURAL RESOURCES DIVISION OF FORESTRY AND WILDLIFE

Torrie Nohara responded to SCS's query via an email dated August 27, 2020:

> Cathy, sorry for the delay in getting back to you. I have been unable to locate any NAH inventory trails in the areas of these bridges. The only thing I found was at the Kopiliula bridge, the EMI management road is right next to the bridge. There is a gate and a pump house located at the bridge. Lots of people park there to access the waterfall behind the bridge. Thanks for checking with us regarding this issue. Good luck with your project.
>
> Mahalo,
> Torrie Nohara

Concerns: Ms. Nohara did not express any concerns about potential impacts to cultural resources or traditional cultural practices his email. However, she did mention the historic structures located in close proximity to Bridge #19, Kopili'ula Stream Bridge, which are documented in the Bassford et al. (2020) archaeological inventory survey report.

INTERVIEWS

DR. SCOTT FISHER, CHIEF CONSERVATION OFFICER, HAWAI'I LAND TRUST; MAUI/LĀNA'I BURIAL COUNCIL REPRESENTATIVE; AND FORMER ASSOCIATE DIRECTOR OF CONSERVATION, HAWAIIAN ISLANDS LAND TRUST

Dr. Fisher is the Chief Conservation Officer of Hawai'i Land Trust (HILT), where he formerly served as Chief Conservation Officer. The mission of HILT, a state-wide conservation organization, focuses on sustainability in an effort to protect the lands for current and future generations. He also is a current member of the Maui/Lāna'i Islands Burial Council. Dr. Fisher's family is from Maui. Due to complications with the pregnancy, Dr. Fisher's mother traveled to O'ahu to give birth. Shortly after his birth, he and his mother returned to Maui. Dr. Fisher grew up in Kula, which is where he and his family currently live. Dr. Scott Fisher was interviewed by Cathleen Dagher, SCS Senior Archaeologist, on August 28, 2020, via phone with Zoom visuals. This interview is summarized below.

The cultural significance of Hāna District is so extensive the entire district is considered a wahi pana [legendary place]. Dr. Fisher highlighted a few of the major areas of cultural significance in the region: Hāna was the home of Ku'ula, the Hawaiian god of fishing; Haneo'o Fishpond, although not near any of the bridges associated with the current project, is associated with the mo'o goddess Kihawahine; and Pu'u o Pele, high up on Haleakalā, is where the volcano goddess Pele made her home for a time.

Dr. Fisher focused his discussion of the history and culture of Hāna during the early 20th century, as the earliest bridge on Hāna Highway was constructed in the early 1900s. The Hāna Highway bridges were necessary to facilitate transportation because the koʻolau (windward) side of the Island is so incised by gulches and valleys. During the early 20th century, around the time these bridges were built, Hāna saw a big influx of a several things: the production of sugar, which played a big part in life in Hāna; cattle ranching which took hold towards the middle of the 20th century; and the production of rubber, which played a big role in Hāna around the time of the World War I.

During World War I, Koʻolau Moku and Hāna Moku both had fairly extensive rubber plantations which were established to facilitate the production of rubber for the war effort. While also used in the manufacture of general items (i.e., automobile tires, etc.), the latex and rubber produced in Hāna was primarily used in the manufacture of gas masks to help meet the increased demand created by the use of poison gas (i.e., chloride gas) against the Allies during World War I. The hose and the gas mask itself were made out of rubber.

The production of rubber in Hāna was not successful. Dr. Fisher speculated that, while there may have been other economic forces at play, the reason the production of rubber was not successful was that after World War I ended, the need for war materials decreased and a way to make it a profitable venture was not found. There still is a remnant of a rubber plantation in Nāhiku and there still are a large number of rubber trees in the area. The east part of Maui, from Koʻolau Ahupuaʻa to Kaupō Ahupuaʻa is littered with a broad spectrum of economic ventures. So, Dr. Fisher surmises "there may have been a connection between the need for economic productivity and the construction of these bridges. And of course now, these bridges help facilitate tourism."

Dr. Fisher goes on to briefly discuss the significance of the District of Hāna during World War II, which he believes is often overlooked, which consisted of one event involving the General Royal T. Frank, a U.S. Army transport boat. The General Royal T. Frank was sailing between Oʻahu and Hawaiʻi Island, stopped briefly in Maui. On the morning of January 28, 1942, as the General Royal T. Frank traversing the ʻAlanuihaha Channel, just off the Hāna coast, it was torpedoed by a Japanese I-1 boat, sinking the ship and taking the lives of nineteen of the soldiers. The ship went down very fast, possibly because it was transporting war materials. As troops were thrown overboard into the oily water on the impact or were forced to jump as the ship sank, many of the survivors were badly injured, some from ingesting oil. Those who were injure convalesced in Hāna School. For many years this story was heavily covered up, with the reason why not known.

Within a little over 100 years, these bridges have overseen five major economic trends (i.e., the brief period of rubber production, sugar cane production, cattle ranching, military, and tourism) in Hāna, which exemplify the story of Hawaiʻi.

Concerns: Dr. Fisher did not express concerns pertaining to negative impacts to cultural resources or traditional cultural practices in the vicinity of any of the bridges proposed for improvement.

Note: Dr. Fisher provided reviewed the above summary of his interview with SCS and provided written permission via an email dated March 29, 2021:

> Aloha Cathy,
> I apologize for taking so long to get back to you. I have read through the document, and it looks great. I didn't have any changes. I am not near a scanner, so I was wondering if you could use this email as a proxy giving my support for your use of my interview (instead of the attached sheet, which I can print, but not scan back to you).
>
> Mahalo
>
> Scott
>
> Scott Fisher, Ph.D.
> Chief Conservation Officer, Hawai‘i Land Trust

CONCLUSION AND RECOMMENDATIONS

The Cultural Impact Assessment has gathered information about the project area and its surroundings through archival and historical research and sought information from individuals knowledgeable about the area in order to assess potential impacts to the cultural resources, cultural practices and beliefs identified as a result of the proposed project. This information has been analyzed for the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place, as recommended by the OEQC Guidelines (2012). Based upon this review and analysis, no traditional cultural practices are currently known to be conducted within the proposed project area. Thus, it is reasonable to conclude that Hawaiian rights related to gathering, access, or other customary activities within the project area will not be affected and there will be no adverse effect upon historic properties, cultural practices, or religious and spiritual beliefs.

REFERENCES

Bassford, Ian, Emily Opack, and Michael Dega
2020 *Archaeological Inventory Survey for the Hāna Highway Bridge Improvement Project, Puʻūmāile and Pāpaʻaʻēa, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa, Hāmākualoa and Koʻolau Districts, Island of Maui TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way*. Scientific Consultant Services, Inc. Honolulu.

Beaglehole, J.C.
1967 The Journals of Captain Cook on His Voyages of Discovery Vol.3. Cambridge University Press, Cambridge.

Beckwith, Martha
1940 *Hawaiian Mythology*. The University of Hawaii. Honolulu.

Brennan, Joseph
1995 *Paniolo*. Ku Papaʻa Press. Honolulu, Hawaii.

Chinen, Jon
1961 *Original Land Titles in Hawaii.* Copyright 1961 Jon Jitsuzo Chinen. Library of Congress Catalogue Card No. 61-17314.

Chronicling America: Historic American Newspapers. Lib. of Congress.
The Honolulu Republican. (Honolulu, T.H.), 22 Sept. 1901.
http://chroniclingamerica.loc.gov/lccn/sn85047165/1901-09-22/ed-1/seq-9/
The Maui News. (Wailuku, Maui, H.I.), 28 March 1908.
http://chroniclingamerica.loc.gov/lccn/sn82014689/1908-03-28/ed-1/seq-5/
Honolulu Star-Bulletin. (Honolulu [Oahu, Hawaii), 30 Jan. 1914.
http://chroniclingamerica.loc.gov/lccn/sn82014682/1914-01-30/ed-1/seq-4/
The Maui News. (Wailuku, Maui, H.I.), 13 June 1922.
http://chroniclingamerica.loc.gov/lccn/sn82014689/1922-06-13/ed-1/seq-6/

Cleghorn, Paul and Kathie Rogers
1987 *Preliminary Historical and Archaeological Investigations of Hāna Ranch Lands, Maui, Hawaiian Islands*. Ms. On file at the State Historic Preservation Division, Honolulu.

Condé, Jesse, and Gerald Best
1973 *Sugar Trains, Narrow Gauge Rails of Hawaii*. Glenwood Publishers: Felton, California.

County of Maui's Real Property Assessment and Tax Billing Information website
2021 http://www.mauipropertytax.com/. Accessed January 2021.

Cowan-Smith, Virginia and Bonnie Domrose Stone
1988 *Aloha Cowboy*. University of Hawaii Press. Honolulu.

Daws, G.
1962 *Shoal of Time: History of the Hawaiian Islands.* University of Hawai‘i Press. Honolulu.

Day, A. Grove
1984 *History Makers of Hawaii*. Mutual Publishing of Honolulu, Honolulu.

Duensing, Dawn E.
2001 National Register of Historic Places Registration Form. Hana Belt Road. Manuscript.

2005 *Hana Belt Road HAER HI-75*. National Park Service, U.S. Department of the Interior, Washington, D.C.

2007 The Häna Belt Road: Paving the Way for Tourism. *The Hawaiian Journal of History, vol. 41.*

Folio, K., Hill, R., Lee-Greig, T.L., and Hammatt, H.H.
2015 *An Archaeological Literature Review for the Hana Highway, Route 360, Bridge Preservation Plan within the Hana Highway Historic District, Multiple Ahupuaa, Multiple Districts, Island of Maui, Multiple TMKs (Zone 1: Sections 1-4 and Zone 2: Section 9)*. Cultural Surveys Hawai‘i, Kailua.

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Kaua‘i, O‘ahu, Maui, Molokai, and Lanai, State of Hawai‘i.* USDA Soil Conservation Service, GPO, Washington, D.C.

Fornander, Abraham
1919-1920 *Hawaiian Antiquities and Folklore*. Bishop Museum Press, Honolulu.

1969 *An Account of the Polynesian Race, Its Origins and Migrations*. Vol. 1 to 3. Charles E. Tuttle Co. Inc.: Jutland.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte
2013 Online Rainfall Atlas of Hawai‘i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1. http://rainfall.geography.hawaii.edu/howtocite.html. Accessed January 2021.

Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger.
2014 Evapotranspiration of Hawai‘i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai‘i. http://climate.geography.hawaii.edu/interactivemap.html. Accessed January 2021.

Handy, E.S. Craighill
1940 The Hawaiian Planter, Volume 1. Bishop Museum Bulletin 161, Bishop Museum Press, Honolulu.

Handy, E.S.C., and E.G. Handy
1972 *Native Planters of Old Hawai'i.* Bishop Museum Bulletin 233. Bernice Pauahi Bishop Museum, Honolulu.

'Ī'ī, John Papa
1959 Fragments of Hawaiian History. Mary Kawena Pukui, translated; Dorothy Barrère, edited. Bishop Museum Press, Honolulu.

Kamakau, Samuel M.
1961 *Ruling Chiefs of Hawaii: Revised Edition.* Kamehameha Schools Press, Honolulu.

1963 Ka Po'e Kahiko. Bishop Museum Special Publication 51. Honolulu.

Kame'eleihiwa, Lilikalā
1992 *Native Land and Foreign Desires: Pehea La E Pono Ai?* Bishop Museum Press. Honolulu.

Kelly, Marion
1983 *Na Māla o Kona*: *Gardens of Kona*. Report 83-2, Department of Anthropology. Bishop Museum. Bishop Museum Press. Honolulu.

1998 A *Gunboat Diplomacy, Sandalwood Lust and National Debt.* In *Ka Wai Ola o OHA,* Vol. 15, No. 4, April 1998.

Kirch, P.
1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu.

2011 "When Did the Polynesians Settle Hawai'i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer," in *Hawaiian Archaeology*. 12 (2011) pp. 3-26.

Kirch, P. V. and Sahlins, M.
1992 *Anahulu*. Vol. 1 and 2. University of Chicago Press. Chicago.

Kolb, Michael, Maria Orr, and Patty Conte
1993 *Na Wahi Pana O Hāmoa, A Historical and Archaeological Survey of a Windward East Maui Community, Hāna District, Maui*. Prepared for The Native Hawaiian Culture & Arts Program.

Kuykendall, R.S.
1938 *The Hawaiian Kingdom*. Vol. 1. University of Hawai'i Press. Honolulu.

Maui County Real Property Assessment Division Database
2021 http://www.qpublic.net/hi/maui/search.html. Accessed January 2021.

Lucas, Paul F. Nahoa
1995 *A Dictionary of Hawaiian Legal Land-terms*. Native Hawaiian Legal Corporation. University of Hawai‘i Committee for the Preservation and Study of Hawaiian Language, Art and Culture. University of Hawai‘i Press, Honolulu.

Lyons, C.J.
1875 A Land Matters in Hawaii. *The Islander*, Vol. I, Honolulu.

Maly, Kepā and Onaona Maly
2001 *Wai O Ke Ola: He Wahi Mo‘olelo No Mauihikia, A Collection of Native Traditions and Historical Accounts of the Lands of Hämäkua Poko, Hämäkua Loa and Ko‘olau, Maui Hikina (East Maui), Island of Maui. Volume I*. Kuku Pono Associates, Hilo.

Malo, D.
1951 *Hawaiian Antiquities*. Bishop Museum Special Publication 2. Bishop Museum Press, Honolulu.

Office of Hawaiian Affairs
2021 Kipuka Online Database (http://kipukadatabase.com/kipuka). Accessed January 2021.

Parker, Patricia L., and Thomas F. King
1998 *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin 38. Washington, D.C.: National Park Service.

Pualewa, W.N
1863 *Maui story of Eleio, the kahu of Kakaalaneo, the alii*. https://nupepa-hawaii.com/2015/06/15/maui-story-of-eleio-the-kahu-of-kakaalaneo-the-alii-by-w-n-pualewa-1863. Accessed January 2021.

Pukui, Mary Kawena and Samuel Elbert
1986 *Hawaiian Dictionary*. University of Hawaii Press, Honolulu.

Pukui, Mary Kawena, Samuel Elbert, Esther Mookini
1974 *Place Names of Hawaii*. University of Hawai‘i Press, Honolulu.

State of Hawaii Office of Environmental Quality Control
2012 *Guide to the Implementation and Practice of the Hawaii Environmental Policy Act, 2012 Edition*. State of Hawaii, Office of Environmental Quality Control, Honolulu. (http:// www.hawaii.gov/health/environmental/oeqc/index.html). Accessed January 2021.

Waihona Aina Database
2021 https://www.waihona.com. Accessed January 2021.

Walker, Winslow W.
1931 *Archaeology of Maui*. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

APPENDIX A: EXAMPLE LETTER OF INQUIRY

Aloha kāua:

Scientific Consultant Services, Inc. is seeking information on cultural resources and traditional, previously or on-going, traditional cultural activities in the vicinity of proposed improvements to six historic bridges along Hāna Highway (Hāna Belt Road, Route 360) on the Island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliʻula Stream Bridge (MP 21.7) and staging area, ʻUlaʻino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) in the Ahupuaʻa of Puʻuomāile, and Pāpaʻaea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUla´ino, and Makapu´u, Hāmākualoa and Ko´olau Districts, Island of Maui, Hawai´i [TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way].

The proposed action is being conducted by the Federal Highway Administration, Central Federal Lands Highway Division, in partnership with the State of Hawaii Department of Transportation. The Hāna Belt Road is designated as State Inventory of Historic Places (SIHP) State Site # 50-50-va-01638. In 2001, the Hāna Belt Road was added to the National Register of Historic Places (National Register Reference # 01000615).

The overall purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

The purpose of this Cultural Impact Assessment (CIA) is to identify and understand the importance of any traditional Hawaiian and/or historic cultural resources or traditional cultural practices associated with the adjacent ahupuaʻa. In an effort to promote responsible decision-making, the CIA will gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about the area in order to assess potential impacts to the cultural resources, cultural practices and beliefs identified as a result of the proposed Project. We are seeking your kōkua and guidance regarding the following aspects of our study:

- General history as well as present and past land use of the project area

- Knowledge of cultural resources which may be impacted by future development of the project area (i.e. historic and archaeological sites, as well as burials)
- Knowledge of traditional gathering practices in the project area, both past and ongoing
- Cultural associations of the project area, such as legends, traditional uses and beliefs
- Referrals of kūpuna or elders and kamaʻāina who might be willing to share their cultural knowledge of the project area and the surrounding ahupuaʻa
- Due to the sensitive nature regarding iwi kūpuna or ancestral remains discovered, manaʻo regarding nā iwi kūpuna will be greatly appreciated
- Any other cultural concerns the community has related to Hawaiian cultural practices within or in the vicinity of the project area.

Enclosed are maps showing the proposed project area. I invite you to contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or send me an email at cathy@scshawaii.com with any information or recommendations concerning this Cultural Impact Assessment. We would greatly appreciate hearing from you!

Mahalo nui for your time and any information you would like to contribute.

Aloha ā hui hou,

Cathleen Dagher
Senior Archaeologist

Enclosures (12)

APPENDIX B: CIA NOTICE PUBLISHED IN KA WAI OLA, SEPTEMBER 2019

CULTURAL IMPACT ASSESSMENT - MĀLAMALAMAIKI AHUPUAʻA, SOUTH HILO DISTRICT, ISLAND OF HAWAIʻI

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for a single-family residence being proposed for a roughly 6.48-acre parcel (TMK: (3) 2-5-012:028) situated in Mālamalamaiki Ahupuaʻa (located south of Honomū Ahupuaʻa), South Hilo District, Island of Hawaiʻi. Please contact ASM Affiliates if you would like to participate or contribute to this study by sharing your manaʻo about any cultural or historical resources or other information you believe may be relevant. This includes, but not limited to, knowledge of past land use, history, traditional cultural uses of the proposed project area; or those who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property. If you have and can share any such information please contact Lokelani Brandt (lbrandt@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

CULTURAL IMPACT ASSESSMENT ASSESSMENT - THE WAIKŌLOA VILLAGE SOLAR PROJECT

On behalf of EDF Renewables, ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for the proposed Waikōloa Village Solar Project. The proposed solar site on TMK (3) 6-8-002:018 and 019 has a roughly 1,000-acre study area in Waikōloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Please contact Lokelani Brandt if you would like to participate or contribute to this study by sharing your manaʻo about any cultural or historical resources or other information you believe may be relevant. This includes, but not limited to, knowledge of past land use, history, traditional cultural uses of the proposed project area; or those who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property. If you have and can share any such information please contact Lokelani Brandt (lbrandt@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

CULTURAL IMPACT ASSESSMENT - KUPEHAU SOLAR PROJECT IN KUNIA, HONOULIULI AHUPUAʻA

On behalf of the project owner, 174 Power Global, and its planning consultant, Group 70 International, Inc. dba G70, TCP Hawaiʻi, LLC, is preparing a Cultural Impact Assessment (CIA) for the Kupehau Solar project in Kunia, Honouliuli Ahupuaʻa. The project area at TMK (1) 9-2-004:008 is 400 acres. These lands are located two miles west of Kunia Road and the Royal Kunia neighborhood. Please contact Chris Monahan at (808) 754-0304 or mookahan@gmail.com if you would like more information; or if you would like to participate or contribute to this study by sharing your manaʻo about any cultural or historical resources or other information you believe may be relevant. This could include moʻolelo (oral history) or any recollections about the project area in the past, or use of these lands that may include (in the past or currently) traditional and customary practices. Mahalo nui!

CULTURAL IMPACT ASSESSMENT - THE DEPARTMENT OF WATER SUPPLY LĀLĀMILO 10MG RESERVOIR

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for the proposed County of Hawaiʻi Department of Water Supply Lālāmilo 10MG Reservoir located on a roughly 10-acre portion of TMK: (3) 6-8-001:001, Waikōloa Ahupuaʻa, South Kohala District, Island of Hawaiʻi. Please contact ASM Affiliates if you would like to participate or contribute to this study by sharing your manaʻo about any cultural or historical resources or other information you believe may be relevant. This includes, but not limited to, knowledge of past land use, history, traditional cultural uses of the proposed project area; or those who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property. If you have and can share any such information please contact Lokelani Brandt (lbrandt@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

CULTURAL IMPACT ASSESSMENT - HĀNA

Scientific Consultant Services, Inc. (SCS) is seeking information on cultural resources and traditional, previously conducted or on-going, traditional cultural activities in the vicinity of proposed improvements to six historic bridges along Hāna Highway (Hāna Belt Road, Route 360) on the Island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puolaukanoa Stream Bridge (MP 11.0), Kopiliʻula Stream Bridge (MP 21.7) and staging area, ʻUlaʻino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.5) in the Ahupuaʻa of Puʻuomāile, and Pāpaʻaea, East Makaiwa, Kōlea, Loiloa, Kaliae, Keknapaweta, ʻUlaʻino, and Makapuʻu, Hāmākualoa and Koʻolau Districts, Island of Maui, Hawaiʻi (TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way). The proposed action is being conducted by the Federal Highway Administration, Central Federal Lands Highway Division, in partnership with the State of Hawaii Department of Transportation. The Hāna Belt Road is designated as State Inventory of Historic Places (SIHP) State Site # 50-50-va-01638. In 2001, the Hāna Belt Road was added to the National Register of Historic Places (National Register Reference # 01000615). Please respond within 30 days to Cathleen Dagher, Senior Archaeologist, at (808) 597-1182.

CULTURAL IMPACT ASSESSMENT - KAHULUI, WAILUKU AHUPUAʻA

Scientific Consultant Services, Inc. (SCS) is seeking information on cultural resources and traditional, previously or on-going, traditional cultural activities in the vicinity of the proposed Department of Transportation (DOT) Kahului Baseyard Improvement Project in Kahului, Wailuku Ahupuaʻa, Wailuku District, Island of Maui, Hawaiʻi (TMK: (2) 3-8-079:018 por.). The Department of Transportation proposes to make various improvements at the Kahului Baseyard facility, which was constructed approximately 40 years ago. The project site encompasses a 5.2-acre portion of an approximately 22-acre parcel. The majority of the site is paved and has several buildings utilized for agency operations including a district office, maintenance, industrial repair, and industrial storage facilities. Some components of the facility have reached the end of their useful life. Proposed improvements include the replacement of a wash rack and increasing the volume and operational capacity of the existing fuel station. New fuel tanks will be placed on relatively the same footprint as the originals, with secondary containment systems in place to provide protection in the case of any fuel spills. Photovoltaic systems may be installed on all existing buildings subject to the availability of funding. Please respond within 30 days to Cathleen Dagher, Senior Archaeologist, at (808) 597-1182 or via email (cathy@scshawaii.com).■

APPENDIX C: EXAMPLE FOLLOW-UP LETTER

Aloha kāua:

This is the follow-up to our August 25, 2020 letter pertaining to the Cultural Impact Assessment for the proposed Hana Bridges Improvements project. Scientific Consultant Services, Inc. is seeking information on cultural resources and traditional cultural practices conducted previously, or on-going, in the vicinity of six historic bridges along Hāna Highway (Hāna Belt Road, Route 360) on the Island of Maui. The bridges are Kailua Stream Bridge (Mile Post [MP] 5.9); Makanali Stream Bridge (MP 8.2); Puohokamoa Stream Bridge (MP 11.0); Kopiliʻula Stream Bridge (MP 21.7) and staging area; ʻUlaʻino Stream Bridge (MP 27.9); and Mokulehua Stream Bridge (MP 28.3). The bridges are located in the Ahupuaʻa of Puʻuomāile, and Pāpaʻaea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu, within the Districts of Hāmākualoa and Koʻolau, Island of Maui, Hawaiʻi [TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and the Hāna Highway Right-of-Way].

The proposed undertaking is being conducted by the Federal Highway Administration, Central Federal Lands Highway Division, in partnership with the State of Hawaii Department of Transportation. The Hāna Belt Road is designated as State Inventory of Historic Places (SIHP) State Site # 50-50-va-01638. In 2001, the Hāna Belt Road was added to the National Register of Historic Places (National Register Reference # 01000615). The overall purpose of the proposed undertaking is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.
The purpose of this Cultural Impact Assessment (CIA) is to identify and understand the importance of any traditional Hawaiian and/or historic cultural resources or traditional cultural practices associated with the adjacent ahupuaʻa. In an effort to promote responsible decision-making, the CIA will gather information about the project area and its surroundings through research and interviews with individuals that are knowledgeable about the area in order to assess potential impacts to the cultural resources, cultural practices and beliefs identified as a result of the proposed Project. We are seeking your kōkua and guidance regarding the following aspects of our study:

- General history as well as present and past land use of the project area
- Knowledge of cultural resources which may be impacted by future development of the project area (i.e. historic and archaeological sites, as well as burials)
- Knowledge of traditional gathering practices in the project area, both past and ongoing
- Cultural associations of the project area, such as legends, traditional uses and beliefs
- Referrals of kūpuna or elders and kamaʻāina who might be willing to share their cultural knowledge of the project area and the surrounding ahupuaʻa
- Due to the sensitive nature regarding iwi kūpuna or ancestral remains discovered, manaʻo regarding nā iwi kūpuna will be greatly appreciated
- Any other cultural concerns the community has related to Hawaiian cultural practices within or in the vicinity of the project area.

I invite you to contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or send me an email at cathy@scshawaii.com with any information or recommendations concerning this Cultural Impact Assessment. We would greatly appreciate hearing from you!

Mahalo nui for your time and any information you would like to contribute.

Aloha ā hui hou,

Cathleen Dagher
Senior Archaeologist

Appendix D.

Biological Survey Report

BIOLOGICAL SURVEY AND ASSESSMENT
for the
HĀNA HIGHWAY BRIDGE REHABILITATION PROJECT
HĀMĀKUA, KO'OLAU & HĀNA, EAST MAUI, HAWAII

INTRODUCTION

The Hana Highway Bridge Rehabilitation Project is located along the rugged, windward slopes of East Maui. The project includes six bridges that have been identified as needing rehabilitation improvements to ensure their long-term serviceability. These bridges, named Kailua, Makanali, Puohokamoa, Kōpili′ula, ′Ula′ino and Mokulehua, span these named streams (see Figure 1).

This biological study has been initiated in fulfillment of environmental requirements of the planning process. The biological resources at each of these locations were assessed individually but are included in this report as integral parts of the overall project.

SITE DESCRIPTION

The windward slopes of East Maui throughout the project corridor are one continuous lowland to montane wet tropical forest. Rainfall ranges from 150 inches per year on the lower slopes up to as much as 350 inches per year in the montane forests (Armstrong, 1983). Soils remain at or near saturation most of the time (Foote et al, 1972). Watershed lengths average only about six to seven miles down to sea level but traverse this distance from an elevation of 8,000 feet. Stream gradients are thus quite steep. Frequent high rainfall events produce torrential spates that scour stream channels and can move great amounts of debris and boulders. Due to the short and steep nature of the watersheds, however, the streams drain rapidly and return to moderate flow levels. These characteristics of terrain, climate and hydrology have a profound effect on what plants and animals can survive and thrive in and around these stream channels.

BRIEF BIOLOGICAL HISTORY OF THE PROJECT AREA

Prior to the year 1800 native ecosystems across windward East Maui were largely intact. Native Hawaiians were scattered throughout the area in small communities and had introduced a small array of their food, fiber and medicinal plants which were mainly concentrated around their dwellings and in low elevation valley bottoms. With the advent of foreign cultures many new plants and animals were introduced and these began to multiply and spread.

At this time there was no road to Hāna but only an ancient foot trail along this coast. By 1910 road building had begun but was initially little more than a dirt road. Some of the earliest bridges date from this period. As access improved and vehicular traffic increased there began an influx of new land uses. Pasture lands increased, introduced trees were planted and homes were built. Many ornamental plants thrived and spread across the landscape. The lowlands were gradually transformed into non-native environments and native species crowded out.

Today many of the habitats around the subject bridges are dominated by non-native plants and wildlife. Only at higher elevations do native ecosystems still thrive, mainly in protected areas.

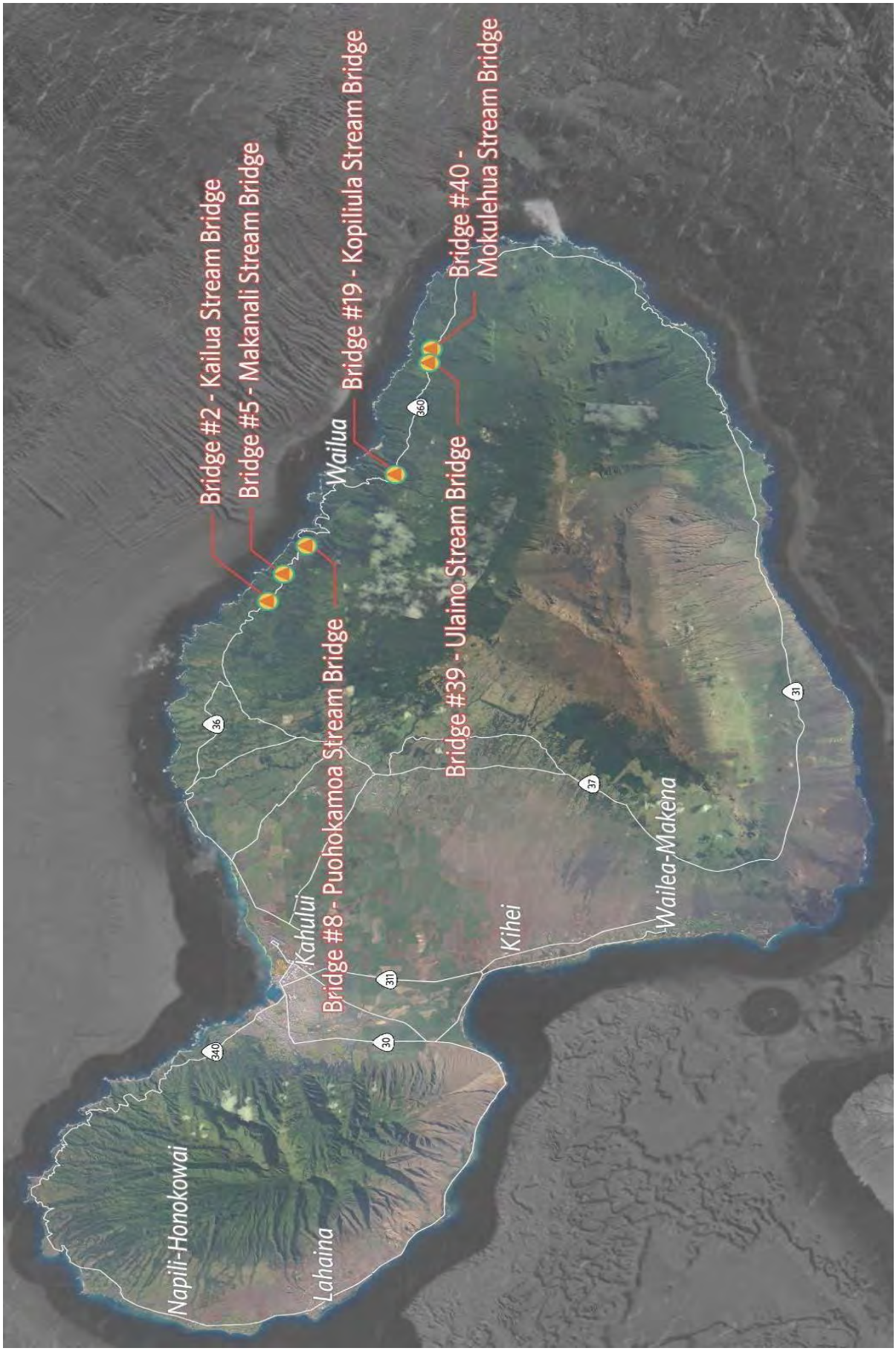


Figure 1 Hāna Highway Bridge Replacement Project Map

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the Hāna Highway Bridge Rehabilitation Project corridor in East Maui which was conducted during December 2018. The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.

2. Document the status and abundance of each species.

3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.

4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BIOLOGICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical and wildlife survey method was used, covering all parts of the six project locations. This included inspection of bridge footprints as well as the stream waters, the stream beds and adjacent banks and gulch sides to distances of 100 feet upstream and 300 feet downstream. Notes were made on plant and animal species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF ENVIRONMENTAL CHARACTERISTICS COMMON TO ALL SIX PROJECT SITES

Vegetation is nearly non-existent in the stream beds. Periodic storm flow events scour stream beds of soils and gravel, leaving only bare rock and boulders. Vegetation on the upper banks and gulch sides, however, has dense growths of trees, shrubs, vines and ferns in this wet tropical environment. Animal life including mammals, birds, insects, mollusks and fish were found to be sparsely represented throughout the project areas. Each of the six bridge sites is described in more detail and assessed individually. Many plant and animal species were found to be present at a majority of the six project sites.

SURVEYS

KAILUA BRIDGE

The vegetation in this survey area was dominated by non-native species. A total of 47 plant species were recorded during the survey and of these 44 were non-native species of trees, shrubs, grasses and ferns. One tree species dominated the stream corridor, hau (*Hibiscus tiliaceus*), which forms a dense tangle of growth. Also common was shoe button ardisia or inkberry (*Ardisia elliptica*). Three native fern species were found: the endemic lepelepe a moa (*Selaginella arbuscula*), and the indigenous uluhe (*Dicranopteris linearis*) and moa (*Psilotum nudum*). All three of these ferns are widespread throughout Hawaii. No other native plant species were seen.

Animal species were poorly represented in their survey area. Just one non-native bird, the red-billed leiothrix (*Leiothrix lutea*) and two non-native insects, the southern house mosquito (*Culex quinquefasciatus*) and the long-tailed blue butterfly (*Lampides boeticus*), were recorded. Although not seen, some other non-native mammals such as rats, mice, mongoose and wild pigs undoubtably occasionally occur in this habitat, and several non-native birds as well. No insects, mollusks, or fish were seen in or around the stream.

An evening survey was conducted to determine if there was any presence of the endemic and Endangered ʻōpeʻapeʻa or Hawaiian hoary bat (USFWS, 2018). A bat detector (Batbox IIID) was employed, set to the frequency of 27,000 hertz that these bats emit when echo-locating for nocturnal flying insect prey. No bats were detected at this site with the use of this device.

No Endangered or Threatened plant or animal species were found to occur in the Kailua Bridge survey area.

Figure 2. Kailua Bridge showing dense forest growth.

Figure 3. Kailua Bridge showing streamside vegetation.

Figure 4. Kailua Stream above the bridge showing growth of hau (*Hibiscus tiliaceus*).

Figure 5. Kailua Stream below the bridge

MAKANALI BRIDGE

The vegetation in this survey area was dominated by non-native species. A total of 44 plant species were recorded during the survey, and of these 41 were non-native trees, shrubs, vines, grasses and ferns. Two non-native trees were found to be common, the African tulip tree (*Spathodea campanulata*) and Henon bamboo (*Phyllostachys nigra*). Three indigenous native species were found, the uluhe fern, ʻieʻie (*Freycinetia arborea*) and hala tree (*Pandanus tectorius*). All three of these species are widespread and common throughout Hawaii. No other native plant species were found.

Animal species were poorly represented in the survey area. Two mammals were recorded here, the non-native mongoose (*Herpestes auropunctatus*) and the endemic and Endangered ʻōpeʻapeʻa (*Lasiurus cinereus semotus*). This bat was detected during an evening survey, with the use of the above mentioned bat detector. Two non-native insects were recorded, the Southern house mosquito and the banana leaf roller butterfly (*Erionota thrax*). No birds were seen or heard in this dense forest. No mollusks or fish were seen in or around the stream. The Endangered bat was the only Federally protected species found in this review area. No other endangered or threatened plant or animal species were found to occur in the Makanali bridge survey area.

Figure 6. Makanali Bridge showing dense forest and steep terrain.

Figure 7. Makanali Stream above the bridge showing dense vegetation.

Figure 8. Makanali Stream below the bridge showing a steep drop off.

Figure 9. Makanali Gulch above the bridge showing a native ʻieʻie vine (*Freycinetia arborea*).

PUOHOKAMOA BRIDGE

The vegetation in this survey area is dominated by non-native species. A total of 51 plant species were recorded during the survey and of these 49 were non-native trees, shrubs, vines, grasses and ferns. Seven non-native species were found to be common: Formosa koa (*Acacia confusa*), African tulip tree, ink berry, pothos (*Epipremnum pinnatum*), yellow ginger (*Hedychium flavescens*), platanillo (*Heliconia collinsiana*) and crepe ginger (*Cheilocostus speciosus*). Just two indigenous native species were found, the hala tree and the uluhe fern. Both of these are widespread and common throughout Hawaii. No other native plant species were found.

The endemic and Endangered ′ōpe′ape′a was detected here during an evening survey with the use of the bat detector. No other mammals were seen but the presence of rats, mice, mongoose and wild pigs are expected in this habitat. One non-native bird, the red-billed leiothrix was identified by its call. No other birds were seen or heard but a few other non-native birds could occur here. Four non-native insects were recorded here. These included the Asian spiny-backed spider (*Gasteracantha mammosa*), the common garden spider (*Argiope appensa*) the black earwig (*Chelisoches morio*) and the Southern hose mosquito. No mollusks or fish were seen in or around the stream.

The Endangered bat was the only federally protected species found in this review area. No other endangered or threatened plant or animal species were found to occur in the Puohokamoa Bridge review area.

Figure 10. Puohokamoa Bridge showing dense forest growth.

Figure 11. Puohokamoa Stream above the bridge.

Figure 12. Puohokamoa Stream below the bridge.

Figure 13. Puohokamoa Stream below the bridge showing dense streamside vegetation.

KŌPILIʻULA BRIDGE

The Kōpiliʻula Bridge is located at the highest elevation on the Hāna Highway at 1,260 feet elevation. Here the vegetation begins to include more middle elevation species and native species become more common.

A total of 60 plant species were recorded during the survey and of these 52 were non-native trees, shrubs, vines, grasses and ferns. One native fern and six other non-native species were found to be common: uluhe fern, Job's tears (*Coix lacryma-jobi*), yellow ginger, African tulip tree, moonflower (*Ipomoea alba*), strawberry guava (*Psidium cattleianum*) and California grass (*Urochloa mutica*).

Eight native plant species were found in the review area. Included were four endemic species, ʻamaʻu fern (*Sadleria cyatheoides*), hāpuʻu pulu tree fern (*Cibotium glaucum*), koa (*Acacia koa*), ʻōhiʻa (*Metrosideros polymorpha*), and four indigenous species, uluhe fern, *Cyperus polystachyos* (no common name), ahaniu (*Machaerina mariscosdes*) and kamole (*Persicaria glabra*). All of these eight native species are common throughout Hawaii. No other native plants were found.

No mammals were found during the survey, although rats, mice, mongoose and wild pigs are expected in this habitat. An evening survey conducted with a bat detector failed to find evidence of any activity of the endemic and Endangered ʻōpeʻapeʻa in the review area.

No bird species were heard or seen during the survey.

Four species of insects were recorded in the review area, including one endemic damselfly, the pīnaoʻula (*Megalagrion calliph*ya), one indigenous dragonfly, pīnao or globe skimmer (*Pantala flavescens*), and two non-native species, the blowfly (*Rhinia Testacea*) and the small rice grasshopper (*Oxya japonica*). No mollusk or fish were seen in or around the stream.

No Endangered or Threatened plant or animal species were found to occur in the Kōpiliʻula Bridge review area.

Figure 14. Kōpili′ula Bridge showing a stream diversion.

Figure 15. Kōpili′ula Stream above the bridge.

Figure 16. Kōpili′ula Stream below the bridge.

Figure 17. Kōpili′ula Stream below the bridge showing a level section flowing toward a waterfall.

ʻULAʻINO BRIDGE

The vegetation in this survey area was dominated by non-native species. A total of 55 plant species were recorded during the survey, and of these 52 were non-native trees, shrubs, grasses and ferns. Six non-native species were found to be common. These included California grass, yellow ginger, lobster claw (*Heliconia bihai*), ki (*Cordyline fruticosa*), parasitic maiden fern (*Cyclosorus parasiticus*) and crepe ginger. Three indigenous native plant species were found in the review area. There were the uluhe fern, the (*Cyperus polystachyos*) and the hala tree. All three of these native species are common throughout Hawaii. No other native plants were found.

No mammals were found during the survey, although non-native rats, mice, mongoose and wild pigs are expected int his habitat. An evening survey conducted with a bat detector failed to find evidence of any activity of the endemic and Endangered ʻōpeʻapeʻa in the review area.

Three species of non-native bird were recorded during the survey, the zebra dove (*Geopelia striata*), the spotted dove (*Streptopelia chinensis*) and the hwamei (*Leucodioptron canorum*).

Three species of non-native insects were recorded during the survey, the Asian spiny-backed spider, the Southern house mosquito and the honey bee (*Apis mellifera*). No mollusks or fish were seen in or around the stream.

No Endangered or Threatened plant or animal species were found to occur in the ʻUlaʻino Bridge review area.

Figure 18. ʻUlaʻino Bridge view upstream showing dense forest.

Figure 19. ʻUlaʻino Stream above the bridge showing steep sides and dense forest growth.

Figure 20. ʻUlaʻino Stream below the bridge flowing toward a waterfall.

Figure 21. ʻUlaʻino Stream showing steep sides with dense growth.

MOKULEHUA BRIDGE

The vegetation in this review area was dominated by non-native species. A total of 44 plant species were recorded during the survey, and of these 43 were non-native trees, shrubs, vines, grasses and ferns. Three non-native species were found to be common, the parasitic maiden fern, the yellow ginger and the African tulip tree. Just one indigenous native fern was found in the review area, the ʻēkaha or bird's nest fern (*Asplenium nidus*). This large fern is common in lowland wet forest throughout Hawaii. No other native plants were found.

Two domestic mammal species were seen, the domestic cat (*Felis catus*) and the domestic dog (*Canis familiaris*), both associated with nearby homes. Also expected in this habitat are non-native rats, mice, mongoose and wild pigs. An evening survey conducted with a bat detector failed to find evidence of any activity of the endemic and Endangered ʻōpeʻapeʻa in the review area. No bird species were seen or heard in this review area.

Just two non-native insect species were found in this review area, the Southern house mosquito and the Asian swallowtail butterfly (*Papilio xutha*). No mollusks or fish were seen in or around the stream.

No Endangered or Threatened plant or animal species were found to occur in this Mokulehua Bridge review area.

Figure 22. Mokulehua Bridge showing adjacent properties with ornamental vegetation.

Figure 23. Mokulehua Bridge with view up the rocky stream bed.

Figure 24. Mokulehua Bridge with view of upstream vegetation.

Figure 25. Mokulehua Stream below the bridge showing ornamental plantings on adjacent properties.

DISCUSSION AND RECOMMENDATIONS

The Hāna Highway Bridge Rehabilitation Project lies within a great region of tropical forest habitat on the windward slopes of East Maui. The project footprint around the six bridge sites represents only a minute fraction of this generally similar habitat. The lower elevations, in which the project lies, have been gradually altered during the past two centuries from native ecosystems into assemblages of non-native forest plantings, escaped ornamental plants and other weedy species. Native plant and animal species have been reduced to some of the hardier and more adaptable representatives. This is the setting in which these environmental assessments were conducted.

Native plant species found during the surveys included four endemic species and seven indigenous species. All of these are common throughout Hawaii. Just two native insect species were found. One, the pīnaoʹula, is an endemic damselfly that is not common but occurs on four islands and is not a federally protected species. The other native insect is the pīnao or globe skimmer dragonfly which is abundant throughout Hawaii.

Just one native mammal was recorded, the ʹōpeʹapeʹa, but this bat is listed as an Endangered species and requires special consideration. The ʹōpeʹapeʹa is known to occur on nearly all of the Hawaiian Islands, but not a lot is known about population numbers or ranges and habits. This is due to the fact that this bat is active nocturnally and does not make any sounds that are audible to humans. A number of personal twilight sightings and night detections have been made between Hāna and Keʹanae, however, and these findings indicate significant numbers may occur in this forested habitat. This was further confirmed during this survey by detections at Makanali and Puohokamoa Bridges.

ʹŌpeʹapeʹa are strong fliers and highly mobile and have a wide range of habitats. They appear to respond to spikes in insect activity, as they occur in different areas. As a result of this, however, they may be absent from an area at one time and have significant activity there at another time of year. For these reasons it would be likely that there would be periodic events of activity at all of the bridge locations. However, when considering the vast amount of forested and riparian habitat across windward East Maui as compared with the small bridge footprints associated with this project, it would appear that any disturbances resulting from bridge renovations would have a negligible effect on available bat habitats. The ʹōpeʹapeʹa's Endangered status, however, requires involvement of the U.S. Fish and Wildlife Service and they should be consulted for guidance. This would likely involve the timing on the removal of any trees that may be required as work progresses.

No native birds were recorded during the survey. Hawaii's forest birds are highly susceptible to foreign avian diseases that are carried and transmitted by mosquitoes. Mosquitoes are abundant in elevations up to 4,000 feet so Hawaiian forest birds do not thrive below this elevation.

The densely forested habitat is also unsuitable for native seabirds or for the Endangered nēnē goose. Some seabirds may fly upslope over these forests to reach their nesting burrows in the open sub-alpine habitats above the forests but do not occupy or use this forest habitat.

No stream life in the form of native insects, mollusks and fish were seen. The steep stream gradients and the frequent occurrence of powerful streamflow flooding events combine to flush out most life forms and many waterfalls make it difficult for aquatic life forms to migrate very far upstream. Some native aquatic insects like the dragonflies and damselflies are able to successfully spend their aquatic larval stages in small pools from springs and seeps that eventually flow into the larger streams, but none of these types of habitat were found in any of the review area.

The assessment of the biological resources in the six bridges review area found that the only organism that would require special attention and federal guidance was the Endangered ʻōpeʻapeʻa. The use of best management practices to minimize disturbances to stream channels and the adjacent environment is desirable. With the above guidance it is determined that the development of the improvements involved in the Hāna Highway Bridge Rehabilitation project should not have any significant negative effects on the streams and biological resources in this part of Maui.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within each of three groups Ferns, Monocots and Dicots. Taxonomy and nomenclature of the Ferns are in accordance with Palmer (2003), the flowering plants (Monocots and Dicots) are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation

2. Common English or Hawaiian name.

3. Bio-geographical status. The following symbols are used:

   endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   Polynesian = those plants brought to the islands by the Hawaiians during their migrations.

   non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

   A = Abundant = forming a major part of the vegetation within the project area.

   C = Common = widely scattered throughout the area or locally abundant within a portion of it.

   U = Uncommon = scattered sparsely throughout the area or occurring in a few small patches.

   R = Rare = only a few isolated individuals within the project area.

5. Bridge Names (6) Abbreviation

   KA = KAILUA

   MA = MAKANALI

   PU = PUOHOKAMOA

   KO = KŌPILIʻULA

   UL = ʻULAʻINO

   MO = MOKULEHUA

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
FERNS								
ASPLENIACIAE (Asplenium Family)								
Asplenium nidus L.	bird's-nest fern, 'ēkaha	Indigenous						R
ATHYRIACEAE (Lady Fern Family)								
Deparia petersenii (Kuntze) M. Kato	Japanese lady fern	non-native		R				
Diplazium esculentum (Retz.) Sw.	vegetable fern	non-native	R				U	U
BLECHNACEAE (Chain Fern Family)								
Blechnum appendiculatum Willd.	palm fern	non-native	U	R	R	R		
Sadleria cyatheoides Kaulf.	'ama'u	endemic				R		
CIBOTIACEAE (Cibotium Family)								
Cibotium glaucum (Sm.) Hook. & Arnott	hāpu'u pulu	endemic				R		
GLEICHENIACEAE (False Staghorn Family)								
Dicranopteris linearis (Burm.f.) Underw.	'uluhe	indigenous	U	R	U	C	U	
MARATTIACEAE (Marattia Fern Family)								
Angiopteris evecta (G. Forst.) Hoffm.	mule's foot fern	non-native				R		
NEPHROLEPIDACEAE (Sword Fern Family)								
Nephrolepis brownii (Desv.) Hovenc. & Miaym.	Asian sword fern	non-native	U	U	U	R	U	U
POLYPODIACEAE (Polypody Fern Family)								
Phlebodium aureum (L.) J.Sm.	rabbit's-foot fern	non-native		U	U	R	U	U
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	laua'e	non-native	R		U		U	U
PSILOTACEAE (Whisk Fern Family)								
Psilotum nudum (L.) P. Beauv.	moa	indigenous	R					
PTERIDACEAE (Brake Fern Family)								
Adiantum raddianum C. Presl.	delta maidenhair	non-native	R	R	R			
SELAGINELLACEAE (Spike-moss Family)								
Salaginella arbuscula (Kaulf.) Spring	lepelepe a moa	endemic	R					
THELYPTERIDACEAE (Marsh Fern Family)								
Cyclosorus parasiticus (L.) Farw.	parasitic maiden fern	non-native	U	U	U	U	C	C
MONOCOTS								
ARACEAE (Aroid Family)								
Epipremnum pinnatum (L.) Engl.	pothos	non-native			C		U	
Monstera deliciosa Liebmann	monstera	non-native						R

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
Xanthosoma sagittifolium (L.) Schott.	arrow leaf elephant ear	non-native						R
ARECACEAE (Palm Family)								
Archontophoenix alexandrae (Muell.) Wendl & Drude	alexandra palm	non-native						R
Cocos nucifera L.	niu, coconut	Polynesian						U
Dypis lutescens (H. Wendl.) Beentje & J. Dransfield	golden-fruited palm	non-native					U	
Livistona chinensis (Jacq.) R. Br. ex Mart.	Chinese fan palm	non-native					U	U
ASPARAGACEAE (Asparagus Family)								
Cordyline fruticosa (L.) A. Chev.	kī, ti	Polynesian		R	R	U	C	
Dracaena fragrans (L.) Ker-Gawler	fragrant dracaena	non-native					U	
Dracaena marginata Lamack	money tree	non-native					R	
CANNACEAE (Canna Family)								
Canna indica L.	canna, ali′ipoe	non-native		R				
COMMELINACEAE (Spiderwort Family)								
Commelina diffusa N.L. Burm.	honohono	non-native	U	R	U	U	U	U
COSTACEAE (Costus Family)								
Cheilocostus speciosus (J. Konig.) C. Specht	crepe ginger	non-native	U		C		C	
Costus barbatus Suess.	spiral ginger	non-native	R					
Costus woodsonii Maas	Indian head ginger	non-native			R		R	
CYPERACEAE (Sedge Family)								
Cyperus polystachyos Rottb.	----------	indigenous				R	R	
Kyllinga brevifolia Rottb.	kili'o'opu	non-native	R	R	R			
Kyllinga nemoralis (J.R. & G. Forster) Dandy	kili'o'opu	non-native		R	R			
Machaerina mariscoides (Gaud.) J. Kern	'ahaniu	Indigenous				R		
DIOSCOREACEAE (Yam Family)								
Dioscorea pentaphylla L.	pi'a	Polynesian		R	R			
HELICONIACEAE (Heliconia Family)								
Heliconia bihai (L.) L.	lobster claw	non-native					C	
Heliconia collinsiana Griggs.	platanillo	non-native			C			
JUNCACEAE (Rush Family)								
Juncus planifolius R. Br.	broadleaf rush	non-native	R					
Juncus polyanthemos Buchenau	many-flower rush	non-native	U		R	R		

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
MARANTACEAE (Arrowroot Family)								
Calathea crotalifera S. Watson	rattlesnake plant	non-native					R	
MUSACEAE (Banana Family)								
Musa acuminata x balbisiana Colla	banana	non-native		R	R	R	R	R
ORCHIDACEAE (Orchid Family)								
Spathoglottis plicata Blume	Phillipine ground orchid	non-native	R	R		R	R	R
PANDANACEAE (Screwpine Family)								
Freycinetia arborea Gaud.	'ie'ie	indigenous		R				
Pandanus tectorius S. Parkinson ex Z	hala	Indigenous		R	U		U	
POACEAE (Grass Family)								
Axonopus compressus (Sw.) P. Beauv.	broad-leaved carpetgrass	non-native					R	R
Cenchrus purpureus (Schumach.) Morrone	Napier grass	non-native					U	R
Coix lacryma-jobi L.	Job's tears	non-native	R		R	C	U	
Digitaria violascens Link	smooth crabgrass	non-native				R	R	
Eleusine indica (L.) Gaertn.	wiregrass	non-native				R		
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	non-native						R
Megathyrsus maximus (Jacq.) Simon & Jacobs	Guinea grass	non-native				U		
Oplismenus hirtellus (L.) P. Beauv.	basketgrass	non-native		R			R	
Paspalum conjugatum Bergius	Hilo grass	non-native	R	R	R	U	U	U
Phyllostachys nigra (Lodd. ex Lindley) Munro	Henon bamboo	non-native		C				R
Saccharum officinarum L.	sugar cane	non-native					R	
Sacciolepis indica (L.) Chase	Glenwood grass	non-native	R			R	R	R
Setaria palmifolia (J. Konig) Stapf.	palmgrass	non-native	U	U	U			U
Setaria parviflora (Poir.) Kerguelen	yellow foxtail	non-native				R		
Sporobolus indicus (L.) R. Br.	West Indian dropseed	non-native	R			R		R
Urochloa mutica (Forssk.) T.Q. Nguyen	California grass	non-native	U		R	C	C	
ZINGIBERACEAE (Ginger Family)								
Hedychium coronarium J. Konig	white ginger	non-native	U					
Hedychium flavescens N. Carey ex Roscoe	yellow ginger	non-native		U	C	C	C	C
DICOTS								
ANACARDIACEAE (Mango Family)								
Mangifera indica L.	mango	non-native			R			

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
Schinus terebinthifolius Raddi	Christmas berry	non-native						U
ASTERACEAE (Sunflower Family)								
Ageratina riparia (Regel) King & Robinson	Hāmākua pāmakani	non-native	R			R		R
Ageratum conyzoides L.	maile hohono	non-native	U	R	R	U	R	U
Bidens pilosa L.	Spanish needle	non-native	R			R		
Conyza bonariensis (L.) Cronq.	hairy horseweed	non-native				R		
Erechtites valerianifolia (Wolf.) DC.	fireweed	non-native	R	R		R	R	
Emilia sonchifolia (L.) DC.	violet pualele	non-native	U	R	R			
Erigeron bellioides DC.	daisy fleabane	non-native				R	R	
Pluchea carolinensis (Jacq.) G.Don	sourbush	non-native		R				
Sphagneticola trilobata (L.) Pruski	wedelia	non-native	U	R	U	U		
Synedrella nodiflora (L.) Gaertn.	node weed	non-native		R	U			
Youngia japonica (L.) DC.	Oriental hawksbeard	non-native	U	R		R		
BEGONIACEAE (Begonia Family)								
Begonia hirtella Link	Brazilian begonia	non-native	U	U	U	R	R	R
BIGNONIACEAE (Bignonia Family)								
Spathodea campanulata P. Beauv.	African tulip tree	non-native	U	C	C	C	U	C
CARYOPHYLLACEAE (Pink Family)								
Drymaria cordata (L.) Willd.	pipili	non-native			R			
COMBRETACEAE (Indian Almond Family)								
Terminalia myriocarpa Van Heurk & Mull. Arg.	jhalna	non-native				U		
CONVOLVULACEAE (Morning Glory Family)								
Ipomoea alba L.	moon flower	non-native				C		
EUPHORBIACEAE (Spurge Family)								
Aleurites moluccana (L.) Willd.	kūkui	Polynesian			U		R	
Manihot glaziovii Mull. Arg.	ceara rubber tree	non-native					R	
FABACEAE (Pea Family)								
Acacia confusa Merr.	Formosa koa	non-native			C			
Acacia koa A. Gray	koa	endemic				R		
Chamaecrista nictitans (L.) Moench	partridge pea	non-native	R		R	R	R	R
Crotalaria pallida Aiton	smooth rattlepod	non-native					R	
Desmodium heterophyllum (Willd.) D.C.	variable leaved tick trefoil	non-native	R			R		R

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
Desmodium incanum DC.	Spanish clover	non-native			R	R		
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	non-native			R			
Falcateria moluccana (Miq.) Barneby & Grimes	albizia	non-native	U					
Macroptilium atropurpureum (DC.) Urb.	siratro	non-native	R					
Macroptilium lathyroides (L.) Urb.	wild bean	non-native	R				R	
Mimosa pudica L.	hilahila	non-native	R	R	R	R	U	R
Samanea saman (Jacq.) Merr.	monkeypod	non-native				R		
LAURACEAE (Laurel Family)								
Persea americana Mill.	avocado	non-native			R			R
MALVACEAE (Mallow Family)								
Hibiscus tiliaceus L.	hau	Polynesian	A					
Sida rhombifolia L.	arrowleaf sida	non-native	U	R	U	U	R	
MELASTOMATACEAE (Melastoma Family)								
Clidemia hirta (L.) D.Don	Koster's curse	non-native	U	U	U	U	U	U
Tibouchina herbacea (DC.) Cogn.	cane tibouchina	non-native				R	R	
Medenilla venosa (Blume) Blume	holdtight medenilla	non-native						R
MORACEAE (Mulberry Family)								
Ficus platypoda (Miq.) A. Cunn. Ex Miq.	desert fig	non-native		R	U	U	R	U
Ficus microcarpa L.f.	Chinese banyan	non-native						R
MYRSINACEAE (Myrsine Family)								
Ardisia elliptica Thunb.	shoe-button ardisia	non-native	C	U	C	R	R	U
MYRTACEAE (Myrtle Family)								
Eucalyptus robusta Sm.	swamp mahogany	non-native				U		
Melaleuca quinquenervia (Cav.) S.T. Blake	paperbark tree	non-native			R			
Metrosideros polymorpha Gaud.	'ōhi'a	endemic				R		
Psidium cattleianum Sabine	strawberry guava	non-native	R		U		U	U
Psidium guajava L.	common guava	non-native	U	U	U	C	R	U
Syzygium malaccense (L.) Merr. & Perry	'ōhi'a 'ai, mountain apple	Polynesian			U		U	
OLEACEAE (Olive Family)								
Fraxinus uhdei (Wenzig) Lingelsh.	tropical ash	non-native				R		
ONAGRACEAE (Evening Primrose Family)								
Ludwigia octovalvis (Jacq.) Raven	primrose willow	non-native		R	R	R		

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
PHYLLANTHACEAE (Phyllanthus Family)								
Phyllanthuis debilis Klein ex Willd.	niruri	non-native					R	
OXALIDACEAE (Wood Sorrel Family)								
Oxalis corniculata L.	'ihi'ai, yellow wood sorrel	Polynesian			R			
Oxalis debilis Kunth	pink wood sorrel	non-native		R				
PASSIFLORACEAE (Passion Flower Family)								
Passiflora edulis Sims	passion fruit	non-native					R	R
Phyllanthus debilis Klein ex Willd.	niruri	non-native					R	
PIPERACEAE (Pepper Family)								
Piper aduncum L.	spiked pepper	non-native				R		R
PLANTAGINACEAE (Plantain Family)								
Plantago major L.	broad-leaved plantain	non-native		R		R		
POLYGALACEAE (Milkwort Family)								
Polygala paniculata L.	polygala	non-native	U	R	U	R	U	
POLYGONACEAE (Buckwheat Family)								
Persicaria glabra (Willd.) M. Gomez	kamole	Indigenous				R		
ROSACEAE (Rose Family)								
Rubus rosifolius Sm.	thimbleberry	non-native	U	R		R		
SCROPHULARIACEAE (Snapdragon Family)								
Buddleja asiatica Lour.	dog tail	non-native		R		R	R	R
SOLANACEAE (Nightshade Family)								
Solanum torvum Sw.	turkey berry	non-native						R
URTICACEAE (Nettle Family)								
Pilea microphylla (L.) Liebm.	artillery plant	non-native	U	U	U	R	U	R

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within three groups: Mammals, Birds or Insects. Taxonomy and nomenclature for the Mammals follows Tomich (1986), for the Birds the American Ornithologists' Union (2018) and for the Insects Nishida etal (1992). For each species the following information is provided:

1. Scientific name
2. Common name
3. Bio-geographical status. The following symbols are used:

   endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

   indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

   non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

   migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

   A = Abundant = many flocks or individuals seen throughout the area at all times of day
   .

   C = Common = a few flocks or well scattered individuals throughout the area.

   U = Uncommon = only one flock or several individuals seen within the project area.

   R = Rare = only one or two seen within the project area.

5. Bridge Names (6) Abbreviation

   KA = KAILUA

   MA = MAKANALI

   PU = PUOHOKAMOA

   KO = KŌPILIʻULA

   UL = ʻULAʻINO

   MO = MOKULEHUA

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
MAMMALS								
FELIDAE (Cat Family)								
Felis catus L.	domestic cat	non-native						U
CANIDAE (Dog Family)								
Canis familiaris L.	domestic dog	non-native						U
VESPERTILIONIDAE (Common Bat Family)								
Lasiurus cinereus semotus H. Allen	'ōpe'ape'a, Hawaiian hoary bat	endemic		U	U			
VIVERRIDAE (Mongoose Family)								
Herpestes auropunctatus Hodgson	small Indian mongoose	non-native		U				
BIRDS								
COLUMBIDAE (Dove Family)								
Geopelia striata L.	zebra dove	non-native					U	
Streptopelia chinensis Scopoli	spotted dove	non-native					R	
LEIOTHRICHIDAE (Leiothrix Family)								
Leiothrix lutea Scopoli	red-billed leiothrix	non-native	R		R			
Leucodioptron canorum L.	hwamei, Chinese laughing thrush	non-native					R	

SCIENTIFIC	COMMON	STATUS	KA	MA	PU	KO	UL	MO
INSECTS								
Order ARANAE - true spiders								
ARANEIDAE (Orb Weaver Family)								
Argiope appensa Koch	common garden spider	non-native			R			
Gasteracantha mammosa Koch	Asian spiny-backed spider	non-native			R		R	
Order DERMAPTERA - earwigs								
CHELISOCHIDAE (Black Earwig Family)								
Chelisoches morio Fabricius	black earwig	non-native			R			
Order DIPTERA - flies								
CALLIPHORIDAE (Blowfly Family)								
Rhinia testacea Robineau-Desvoidy	blowfly	non-native				R		
CULICIDAE (Mosquito Family)								
Culex quinquefasciatus Say	Southern house mosquito	non-native	R	C	U		U	U
Order HYMENOPTERA - bees, wasps, ants								
APIDAE (Honey Bee Family)								
Apis mellifera L.	honey bee	non-native					U	
Order LEPIDOPTERA - butterflies, moths								
HESPERIIDAE (Skipper Butterfly Family)								
Erionota thrax L.	banana leaf roller	non-native		R				
LYCAENIDAE (Gossamer-winged Butterfly Family)								
Lampides boeticus L.	long-tailed blue butterfly	non-native	R					
PAPILIONIDAE (Swallowtail Butterfly Family)								
Papilio xutha L.	Asian swallowtail butterfly	non-native						R
Order ODONATA - Dragonflies, damselflies								
COENAGRIONIDAE (Damselfly Family)								
Megalagrion callyphia McLachlan	pīnao'ula, Hawaiian damselfly	endemic				R		

SCIENTIFIC	COMMON	STATUS	**KA**	**MA**	**PU**	**KO**	**UL**	**MO**
LIBELLULIDAE (Skimmer Dragonfly Family)								
Pantala flavescens Fabricius	pīnao, globe skimmer dragonfly	indigenous				R		
Order ORTHOPTERA - grasshoppers, crickets								
ACRIDIDAE (Grasshopper Family)								
Oxya japonica Thunberg	small rice grasshopper	non-native				U		

Literature Cited

American Ornithologist's Union 2018. Check-list of North American Birds. 7th edition. American Ornithologists' Union. Washington D.C.

Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2nd. ed.) University of Hawaii Press.

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens. 1972. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Dept. of Agriculture, Soil Conservation Service. Washington, D.C.

Nishida, G.M., G.A. Samuelson, J.S. Strazanac, K.S. Kami. 1992. Hawaiian Terrestrial Anthropod Checklist. Hawaii Biological Survey.

Palmer, D.D. 2003. Hawai'i's Ferns and Fern Allies. University of Hawaii Press. Honolulu.

Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.

U.S. Fish and Wildlife Service. 2018. Endangered and Threatened Wildlife and Plants. Listings and Occurrences for Hawaii. www.usfws.gov/endangered

Wagner, W. L., D.R. Herbst, and S. H. Sohmer. 1999. Manual of the Flowering Plants of Hawaii. University of Hawaii Press and Bishop Museum Press. Honolulu.

Appendix E.

Pre-Assessment Consultation

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

March 27, 2023

In Reply Refer To:
HFPM-16

[INSERT ADDRESSEE HERE]

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear [INSERT ADDRESSEE HERE]:

The Federal Highway Administration, Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is conducting environmental studies to evaluate the impacts of a project to improve six of the historic bridges along Hana Highway (Route 360) on the island of Maui. We are assisted in this effort by our consultant, HDR Engineering, Inc. (HDR). The bridges include the following:

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puohokamoa Stream Bridge (MP 11.0)
- Bridge # 19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

The purpose of the project is to address existing structural deterioration and sub-standard structural conditions by improving the bridges to be consistent with current standards and guidelines for load capacity, bridge railing and transitions, and seismic and scour standards. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges on the route. The six bridges now being studied in more detail have been identified by HDOT as high priority for improvements. Bridge inspections have revealed evidence of structural degradation that requires attention. The bridges also do not meet current load capacity standards, were not designed to current seismic and scour standards, and bridge railings and rail transitions do not meet current crashworthiness requirements. The project would improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities.

At five of the six bridge locations, Kailua Stream Bridge (Bridge #2), Makanali Stream Bridge (Bridge #5), Puohokomoa Stream Bridge (Bridge #8), Ulaino Stream Bridge (Bridge #39), and Mokulehua Stream Bridge (Bridge #40), the proposed solution is to retain the existing substructure, including the character-defining abutments and piers, and provide a new single-span structure that spans over the existing supports. The concrete superstructures would be designed to

best match the existing historic features while also meeting project design criteria. The proposed solution at Kopiliula Stream Bridge (Bridge #19) is to retain the existing bridge in its entirety and construct a new, off-alignment bridge *makai* of the existing bridge.

Enclosed with this letter are maps showing the location of the bridges.

The environmental review for this project is being conducted in accordance with the National Environmental Policy Act (NEPA) and Hawaii Revised Statutes (HRS), Chapter 343.

To aid our assessment of this project, please share with us any input, comments, or information you may have regarding the project, surrounding area, or resources that may be affected. Please mail or email your written comments to the following within 30 days:

Tomasz Kubicz, Project Manager
FHWA-CFLHD
12300 W. Dakota Ave., Suite 380
Lakewood, CO 80228
tomasz.kubicz@dot.gov

Thank you for your participation in the planning of this project. Should you have any questions, please contact me at (720) 963-3498 or tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

Enclosures:

- Project Location Maps

RICHARD T. BISSEN, JR.
Mayor

KEKUHAUPIO R. AKANA
Managing Director

PATRICK S. MCCALL
Director

SHANE T. DUDOIT
Deputy Director

DEPARTMENT OF PARKS AND RECREATION
COUNTY OF MAUI
700 HALI'A NAKOA STREET, UNIT 2
WAILUKU, MAUI, HAWAI'I 96793
www.mauicounty.gov

April 10, 2023

Tomasz Kubicz, Project Manager
FHWA-CFLHD
12300 W. Dakota Ave., Suite 380
Lakewood, CO 80228

Dear Mr. Kubicz:

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT; HANA HIGHWAY BRIDGE IMPROVEMENTS PROJECT, MAUI, HI; HI STP SR360(1)

Thank you for the opportunity to review and comment on the subject project. The Department of Parks and Recreation has no comment at this time.

Should you have any questions, please feel free to contact me or Samual Marvel, Chief of Planning and Development, at Samual.marvel@co.maui.hi.us or (808) 270-7931.

Sincerely,

PATRICK S. MCCALL
Director of Parks and Recreation

c: Samual Marvel, Chief of Planning and Development

PSM:SM

April 10, 2023

Tomasz Kubicz, Project Manager
FHWA-CFLHD
12300 W. Dakota Ave., Suite 380
Lakewood, CO 80228

via email: tomasz.kubicz@dot.gov

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Kubicz,

Thank you for allowing us to comment on the subject project to improve six historic bridges along Hana Highway in the following:

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puokokamoa Stream Bridge (MP 11.0)
- Bridge #19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

In reviewing our records and the information received, Hawaiian Electric Company – Maui County has no objections to the project at this time. Our facilities appear to be beyond your project area and do not appear to be impacted. However, there may be other utilities operated by the communication and cable entities nearby, thus we suggest contacting them for confirmation. If your consultants discover conflicts with our electric facilities upon planning, we highly encourage the customer's consultant to submit plans and a project time schedule as soon as practical so that any field assistance or facility relocation can be provided on a timely basis.

Should you have any questions or concerns, please feel free to contact me at ray.okazaki@hawaiianelectric.com (as we continue to work remotely) or leave a message at 808-871-2340 (office).

Sincerely,

Ray Okazaki

Ray Okazaki
Consulting Engineer, Engineering
Hawaiian Electric Company – Maui County

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Ray Okazaki, Consulting Engineer
Hawaiian Electric Company – Maui County
P.O. Box 398
Kahului, HI 96733

via email: ray.okazaki@hawaiianelectric.com

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Okazaki:

Thank you for your letter dated April 10, 2023, regarding the above-referenced project. We acknowledge that your facilities do not appear to be impacted. Should our consultants identify conflicts with your electric facilities during project design, or if any questions arise, we will coordinate with your office as soon as practical. We are also contacting other utility companies such as communication and cable entities to identify any potential conflicts.

We appreciate your participation in the environmental review process. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

RICHARD T. BISSEN, JR.
Mayor

KEKUHAUPIO R. AKANA
Managing Director

MARC I. TAKAMORI
Director

KAUANOE BATANGAN
Deputy Director

DEPARTMENT OF TRANSPORTATION
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAI'I 96793

TELEPHONE: (808) 270-7511
FAX: (808) 270-7505

April 12, 2023

Tomasz Kubicz, Project Manager
FHWA-CFLHD
12300 W. Dakota Ave., Suite 380
Lakewook, CO 80228

Via email: tomasz.kubicz@dot.gov

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1) (HFPM-16)

Dear Mr. Kubicz,

Thank you for the opportunity to review and comment on this project. We have no comments to make at this time.

Please feel free to contact me should you have any questions.

Sincerely,

Kauanoe Batangan
Deputy Director
Department of Transportation

From:	Kubicz, Tomasz (FHWA)
To:	Nicole Winterton; Oroho, Sean; Beazley, Sandy
Cc:	Badon, Gregory (FHWA)
Subject:	FW: Pre Assessment Consultation Draft Environmental Assessment Hana Highway Bridge Improvements Project - HFPM-16
Date:	Wednesday, April 19, 2023 7:46:46 PM

All,

Another letter on the Hana Highway project.

Thank you,

Tom Kubicz, PE, DBIA
Project Manager
Central Federal Lands Highway Division
Federal Highway Administration
12300 W. Dakota Ave - Lakewood, CO 80228
Office: 720-963-3498
Cell: 202-981-4183

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Wednesday, April 19, 2023 2:16 PM
To: Kubicz, Tomasz (FHWA) <tomasz.kubicz@dot.gov>
Cc: Kuwaye, Kristen <kristen.kuwaye@hawaiianelectric.com>
Subject: Pre Assessment Consultation Draft Environmental Assessment Hana Highway Bridge Improvements Project - HFPM-16

Dear Mr. Kubicz,

Thank you for the opportunity to comment on the subject project. Maui Electric Company has no objection to the project. Should Maui Electric have existing easements and facilities on the subject impacted property and bridges, we will need continued access for maintenance of our facilities. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hana Highway Bridge Improvement project comes to fruition, please continue to keep us informed.

Should there be any questions, please contact me at 808-543-7245.

Thank you,

Rouen Liu
Permit Engineer
Hawaiian Electric Company

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Rouen Liu, Permit Engineer
Hawaiian Electric Company
P.O. Box 398
Kahului, HI 96733

via email: Rouen.liu@hawaiianelectric.com

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Liu:

Thank you for your email dated April 19, 2023, regarding the above-referenced project. We acknowledge that Maui Electric will need continued access for maintenance of your facilities and that you would like to stay informed as the proposed project comes to fruition. We will continue to keep you informed as the project advances and will no preclude access to your facilities through project implementation.

We appreciate your participation in the environmental review process. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
KA 'OIHANA HO'ONA'AUAO
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

OFFICE OF FACILITIES AND OPERATIONS

April 25, 2023

Tomasz Kubicz, Project Manager
FHWA-CFLHD
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228

VIA Email to: tomasz.kubicz@dot.gov

Re: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, Hawaii
HI STP SR360(1)

Dr. Mr. Kubicz:

Thank you for your letter dated March 27, 2023. Based on the information provided, the Hawaii State Department of Education (Department) has the following comment on the Hana Highway Bridge Improvements Project (Project).

The Department requests consultation with the Hana High and Elementary School administration prior to and during the Project to identify and minimize any transportation impact on students, staff, and service providers to the schools.

We appreciate the opportunity to comment. Should you have any questions, please contact Cori China of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us.

Sincerely,

Roy Ikeda
Interim Public Works Manager
Planning Section

RI:ctc

c: Rebecca Winkie, Complex Area Superintendent, Hana/Lahainaluna/Lanai/Molokai
Facilities Development Branch

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Roy Ikeda, Interim Public Works Director
State of Hawaii, Department of Education
Planning Department
P.O. Box 2360
Honolulu, HI 96804

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Ikeda:

Thank you for your letter dated April 25, 2023, regarding the above-referenced project. As requested in your comment letter, we will consult with the Hana High and Elementary School administration prior to and during the project to identify and minimize any transportation impact on students, staff, and service providers to the school.

The draft environmental assessment will describe anticipated construction approaches, potential traffic impacts, and proposed mitigation measures. The primary method of construction will feature the use of Accelerated Bridge Construction (ABC) techniques that allow for the rapid construction of the bridges. While rapid, ABC methods do still include short duration roadway closures (anticipated up to 4 days at each bridge) to install the new bridges. The intent behind this approach is to limit the impacts on school transportation and school operations to the extent practical during construction. FHWA-CFLHD will ensure the timing of roadway closures is coordinated and adequate advance notification is provided. The contract documents will include language requiring the contractor to coordinate these closures with the State, as well as local stakeholders, including Hana High and Elementary School administrations. This coordination will require ample lead time for stakeholder and agency input. The contract will also specify periods when traffic must be accommodated (i.e., closures will not be allowed), as well as requirements for traffic management, risk management, contingency planning, and communications plan submissions for State and stakeholder review and input prior to the closures. This strategy will also include requirements related to public outreach and information related to the construction impacts through various media well in advance of closures.

We appreciate your participation in the environmental review process and look forward to continued coordination as the project progresses. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

April 26, 2023

Ref. No. HFPM-16

U.S. Department of Transportation
Federal Highway Administration
Central Federal Lands Highway Division
Attn: Mr. Tomasz Kubicz
12300 W. Dakota Avenue, Suite 380
Lakewood, Colorado 80228

via email: tomasz.kubicz@dot.gov

Dear Mr. Kubicz:

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the **Hana Highway Bridge Improvements Project** located in Hana, Island of Maui, Hawaii; Various TMK's

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Division of Aquatic Resources, (b) Engineering Division, and (c) Office of Conservation & Coastal Lands on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

April 5, 2023

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (glenn.r.higashi@hawaii.gov)
__Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (daniel.l.ornellas@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the **Hana Highway Bridge Improvements Project**
LOCATION: Hana, Island of Maui; Various TMKs
APPLICANT: U.S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division in Partnership with Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **April 26, 2023.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
(X) We have no comments. RS
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: D K S
Print Name: David Sakoda
Division: Div. of Aquatic Resources
Date: Apr 20, 2023

Attachments

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL
RESOURCES DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 4/20/2023
DAR # 6377

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Russell Sparks, Aquatic Biologist

SUBJECT: Pre-Assessment Consultation for DEA for Hana Highway Bridge Improvements Project.

Request Submitted by: Russell Y. Tsuji, Land Administrator

Location of Project: Hana, Island of Maui; Various TMKs

Brief Description of Project:

This is a pre-consultation effort in preparation to complete a draft environmental assessment (DEA) for a project to improve six of the historic bridges along the Hana Highway (Route 360) on Maui. The bridges to be considered include: Kailua Stream Bridge; Makanali Stream Bridge; Puohokamoa Stream Bridge; Kopiliula Stream Bridge; Ulaino Stream Bridge; and Mokulehua Stream Bridge. There are no specific concerns or comments at this point, but DAR looks forward to reviewing the DEA once completed and will be looking for any impacts that may occur to the streams that these bridges cross.

Comments:

☒ No Comments ☐ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: Date: Apr 20, 2023

David Sakoda for Brian J. Neilson
DAR Administrator

F Cnz. HA
23-157

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

2023 APR -5 P 12:07
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

2023 APR 25 PM 1:34
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED
LAND DIVISION

April 5, 2023

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources (glenn.r.higashi@hawaii.gov)
__Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Maui District (daniel.l.ornellas@hawaii.gov)
X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the **Hana Highway Bridge Improvements Project**
LOCATION: Hana, Island of Maui; Various TMKs
APPLICANT: U.S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division in Partnership with Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **April 26, 2023.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed: _____
Print Name: Trevor Fitzpatrick
Division: OCCL
Date: 4/20/2023

Attachments

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
Office of Conservation and Coastal Lands
P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

LAURA H.E. KAAKUA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF: OCCL: TF

COR: MA 23-157

Apr 20, 2023

Tomasz Kubicz, Project Manager
U.S. Department of Transportation Federal Highways Administration
12300 W. Dakota Ave., Suite 380
Honolulu, HI 96813

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment Regarding the Hana Highway Bridge Improvements Project, Maui County, HI HI STP SR360(1) Located at Various Bridges along Hana Highway
Bridge #2 - Kailua Stream Bridge (Mile Post [MP] 5.9), Bridge #5 - Makanali Stream Bridge (MP 8.2), Bridge #8 - Puohokamoa Stream Bridge (MP 11.0), Bridge #19 - Kopiliula Stream Bridge (MP 21.7), Bridge #39 - Ulaino Stream Bridge (MP 27.9), Bridge #40 - Mokulehua Stream Bridge (MP 28.3)
Plat Numbers: (2) 2-9-010, (2) 1-1-001, (2) 1-2-001, (2) 1-2-003, & (2) 1-3-002

Dear Tomasz Kubicz:

The Office of Conservation and Coastal Lands (OCCL) has reviewed your letter and attachments regarding the subject matter. According to the information in your letter, the Federal Highway Administration Central Federal Lands Highway Division (CFLHD) in partnership with the State of Highway Department of Transportation (HDOT) and assistance from HDR Engineering, Inc. (HDR) is conducting environmental studies to evaluate the impacts of a project to improve six of the historic bridges along Hana Highway (Route 360) on the island of Maui. The letter notes that the six bridges include the following:

- Bridge #2 - Kailua Stream Bridge (MP 5.9)
- Bridge #5 - Makanali Stream Bridge (MP 8.2)
- Bridge #8 - Puohokamoa Stream Bridge (MP 11.0)
- Bridge #19 - Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 - Ulaino Stream Bridge (MP 27.9)
- Bridge #40 - Mokulehua Stream Bridge (MP 28.3)

The letter states that the purpose of the project is to address existing structural deterioration and sub-standard structural conditions by improving the bridges to be consistent with current standards and guidelines for load capacity, bridge railing and transitions, and seismic and scour standards. The letter notes that the six bridges have been identified by HDOT as high priority for improvements.

At five of the six bridge locations (Bridge #2 - Kailua Stream Bridge, Bridge #5 - Makanali Stream Bridge, Bridge #8 - Puohokamoa Stream Bridge, Bridge #39 - Ulaino Stream Bridge, and Bridge #40 - Mokulehua Stream Bridge), the proposed solution is to retain the existing substructure, including the character-defining abutments and piers, and provide a new single-span structure that spans over the existing supports. The concrete superstructures would be designed to best match the existing historic features while also meeting project design criteria. The proposed solution at Bridge #19 - Kopiliula Stream Bridge is to retain the existing bridge in its entirety and construct a new off-alignment bridge makai (seaward) of the existing bridge.

The letter notes that environmental review for this project is being conducted in accordance with the National Environmental Policy Act (NEPA) and Hawaii Revised Statutes (HRS) Chapter 343. On behalf of HDOT and HDR, CFLHD is requesting any input, comments, or information regarding the project.

The OCCL regulates land uses in the State Land Use Conservation District through the issuance of Conservation District Use Permits and Site Plan Approvals to help conserve, protect, and preserve important natural and cultural resources. Based on the information you have provided; it appears that the six bridges may have the following State Land Use designations or district boundaries:

- Bridge #2 Kailua Stream Bridge – Agricultural District and Conservation District
- Bridge #5 Makanali Stream Bridge – Agricultural District and Conservation District
- Bridge #8 Puohokamoa Stream Bridge – Agricultural District and Conservation District
- Bridge #19 Kopiliula Stream Bridge – Conservation District Protective and Resource Subzone
- Bridge #39 Ulaino Stream Bridge – Agricultural District
- Bridge #40 Mokulehua Stream Bridge – Agricultural District

You may want to consider consulting and confirming with the State of Hawaii Land Use Commission (LUC – (808) 587-3822) regarding the bridges and project areas State Land Use designations and boundaries. In the instances where the bridges are near a State Land Use District boundary, it appears that a boundary interpretation may need to be performed. This will help to establish jurisdictional authority at these locations.

Proposed work and land uses in the Conservation District will require review and potentially authorization from the Department or Board of Land and Natural Resources (BLNR). The current rules and regulations of the Conservation District, noted as Hawaii Administrative Rules (HAR) Chapter 13-5, as well as proposed amendments can be found at https://dlnr.hawaii.gov/occl/rules/ .

REF: OCCL: TF COR: MA 23-157
Tomasz Kubicz, Project Manager
U.S. Department of Transportation Federal Highways Administration

Should you have any questions, feel free to contact Trevor Fitzpatrick of the Office of Conservation and Coastal Lands at (808) 798-6660 or trevor.j.fitzpatrick@hawaii.gov .

Sincerely,

S Michael Cain

Michael Cain, Administrator
Office of Conservation and Coastal Lands

CC: Land Use Commission
Maui Division Land Office
County of Maui Planning Department

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Michael Cain, Administrator
State of Hawaii, Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, HI 96809

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Cain:

Thank you for your comments regarding the subject project transmitted through the Land Division in a letter dated April 26, 2023. Information regarding State Land Use designations and boundaries near the project bridges will be included in the Draft Environmental Assessment (Draft EA) for the project. We acknowledge proposed work and land uses in the Conservation District will require review and potential authorization from the Department or Board of Land and Natural Resources. We will continue consultation with your office for land use reviews and potential authorizations as applicable, as well as consult with the Land Use Commission for boundary interpretations should they be required. The need for land use review and potential permits will be identified as a requirement in the Draft EA.

We appreciate your participation in the environmental review process and look forward to continued coordination as the project progresses. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

April 5, 2023

MEMORANDUM

FROM: ~~TO:~~ **DLNR Agencies:**

- X Div. of Aquatic Resources (glenn.r.higashi@hawaii.gov)
- ___ Div. of Boating & Ocean Recreation
- X Engineering Division (DLNR.ENGR@hawaii.gov)
- X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
- X Div. of State Parks (curt.a.cottrell@hawaii.gov)
- X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
- X Land Division – Maui District (daniel.l.ornellas@hawaii.gov)
- X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: ~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the **Hana Highway Bridge Improvements Project**

LOCATION: Hana, Island of Maui; Various TMKs

APPLICANT: U.S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division in Partnership with Hawaii Department of Transportation

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit any comments by **April 26, 2023.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(✓) Comments are included/attached.

Signed: *Carty S. Chang*
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Apr 13, 2023

Attachments

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji

Ref: Pre-Assessment Consultation for Draft Environmental Assessment for the Hana Highway Bridge Improvements Project
Location: Hana, Island of Maui
TMK: Various
Applicant: U.S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division in Partnership with Hawaii Department of Transportation

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Apr 13, 2023

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Carty S. Chang, Chief Engineer
State of Hawaii, Department of Land and Natural Resources
Engineering Division
P.O. Box 621
Honolulu, HI 96809

via email: DLNR.ENGR@hawaii.gov

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Chang:

Thank you for your comments regarding the subject project transmitted through the Land Division in a letter dated April 26, 2023. Information regarding flood hazard zone designations for the project will be included in the Draft Environmental Assessment (Draft EA). Hydraulic analyses are being conducted for each of the six bridges and potential impacts will be described in the Draft EA. Project engineers will also coordinate with the County of Maui to ensure that the project complies with requirements of the floodplain management program.

We appreciate your participation in the environmental review process. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

POLICE DEPARTMENT
COUNTY OF MAUI
55 MAHALANI STREET
WAILUKU, MAUI, HAWAII 96793
TELEPHONE: (808) 244-6400
FAX: (808) 244-6411

RICHARD T. BISSEN, JR.
MAYOR

OUR REFERENCE

YOUR REFERENCE

JOHN PELLETIER
CHIEF OF POLICE

WADE M. MAEDA
DEPUTY CHIEF OF POLICE

April 18, 2023

Mr. Tomasz Kubicz, P.E.
Project Manager
FHWA-CFLHD
12300 West Dakota Avenue, Suite 380
Lakewood, Colorado 80228

Re: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Kubicz:

This is in response to your letter dated March 27, 2023 requesting comments on the pre-assessment consultation for the Draft Environmental Assessment (DEA) for the Hana Highway Bridge Improvements Project.

In review of the submitted documents, we have no objections to the upcoming construction project if it meets minimal standards set forth by county codes and state laws. As this is the only way in and out of Hana for non-four wheeled drive vehicles, traffic is heavy daily with residents and tourist traveling in and out of the area, as well as emergency vehicles (police, fire, medics). Traffic delays need to be kept at a minimum. Majority of the areas affected by the bridge repairs are in narrow areas of the highway where only one vehicle may pass at a time. Traffic congestion may be so great in these areas causing gridlock and making it difficult and unsafe to direct traffic. We suggest the bridge improvements be done in the evening/night hours where traffic is less busy. We also suggest posting proper notification and signage prior to the construction so local residents can make the necessary arrangements to travel accordingly.

During severe weather conditions the roadway through Kaupo and Ulupalakua may not be available. Consideration should be made in the event these occasions will make access to Piilani Highway unavailable.

Pot holes on bridges due to heavy and large trucks driving on Hana Highway, as well as water undermining the bridges, have made them unstable. Majority of the bridges are near waterfalls or heavily rained upon, so consideration should be made on the quality of materials being used to stabilize these bridges.

Thank you for giving us the opportunity to comment on this project.

Sincerely,

Assistant Chief Keola Tom
for: JOHN PELLETIER
Chief of Police

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

John Pelletier, Chief of Police
County of Maui Police Department
55 Mahalani Street
Wailuku, HI 96793

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Pelletier:

Thank you for your comments regarding the subject project in a letter dated April 18, 2023. Your input will be incorporated into the project's draft environmental assessment and planning and design process. With regards to the impacts on traffic and potential traffic delays during construction, we acknowledge the heavy use of the roadway and the need to incorporate design and construction approaches into the project to minimize impacts to the traveling public and essential services. The contractor will be required to perform most work that impacts traffic during overnight hours. The primary anticipated method of construction will feature the use of Accelerated Bridge Construction (ABC) techniques that allow for the rapid construction of the bridges. While rapid, ABC methods do still include short duration roadway closures (anticipated up to 4 days at each bridge) to install the new bridges. FHWA-CFLHD will coordinate the timing of roadway closures and provide advance notifications. The project contract documents will include language requiring the contractor to coordinate closures with the State, as well as local stakeholders, including emergency services (police, fire, medics). This coordination will require ample lead time for stakeholder and agency input, as well as contractor requirements for traffic management, risk management, contingency planning, and communications plan submissions for State and stakeholder review and input prior to the closures. This strategy will also include requirements related to public outreach and information related to the construction impacts through various media well in advance of closures.

We recognize that during construction, work zones adjacent to traffic can cause driver distraction and confusion. To mitigate this, FHWA-CFLHD will require the contractor to utilize strategic advanced signage, as well as mobile traffic control units (i.e., temporary traffic signals) near the start and end of the work zones at each bridge to manage traffic flows during construction.

With regards to durability of the highway and bridges relative to weather events and existing potholes along the Hana Highway, a goal of our bridge improvement project is to install structures that provide a safe, reliable, and durable solution well into the future. While our design seeks to maintain the cultural environment and context of the existing highway, we are proposing improvements and materials that promote longevity and reliability.

We appreciate your participation in the environmental review process. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

RICHARD T. BISSEN JR.
Mayor

KATHLEEN ROSS AOKI
Planning Director

GARRETT E. SMITH
Deputy Director

DEPARTMENT OF PLANNING
COUNTY OF MAUI
ONE MAIN PLAZA
2200 MAIN STREET, SUITE 315
WAILUKU, MAUI, HAWAI'I 96793

May 11, 2023

Mr. Tomasz Kubicz, P.E.
FHWA-CFLHD
12300 West Dakota Avenue, Suite 380
Lakewood, Colorado 80228

Dear Mr. Kubicz:

SUBJECT: REQUEST FOR PRE-ASSESSMENT CONSULTATION FOR THE HANA HIGHWAY BRIDGE IMPROVEMENTS DRAFT ENVIRONMENTAL ASSESSMENT, LOCATED ALONG HANA HIGHWAY (ROUTE 360) RIGHT-OF-WAY, ISLAND OF MAUI, HAWAII; (RFC2023-00033)

The Department of Planning (Department) is in receipt of the request for comments on the proposed improvements to 6 bridges along Hana Highway (Route 360). The project's purpose is to address existing structural deterioration and sub-standard structural conditions. The project will bring these bridges up to current standards for load capacity, bridge railing and transitions, and seismic and scour standards.

The following bridges are being evaluated:

- Bridge #2 – Kailua Stream Bridge, Mile Post (MP) 5.9
- Bridge #5 – Makanali Stream Bridge, MP 8.2
- Bridge #8 – Puohokamoa Stream Bridge, MP 11.0
- Bridge #19 – Kopiliula Stream Bridge, MP 21.7
- Bridge #39 – Ulaino Stream Bridge, MP 27.9
- Bridge #40 – Mokulehua Stream Bridge, MP 28.3

All bridges appear to be in the Hana Highway right-of-way. The bridges and surrounding TMKs appear to be located in the following County of Maui zoning districts:

- Bridge #2: surrounding TMKs 2-9-014:001 and 2-9-013:015 and appears to straddle Agriculture and Interim
- Bridge #5: surrounding TMKs 1-1-001:042 and 1-1-001036 and appears to straddle Agriculture and Interim
- Bridge #8: TMKs 1-1-001:022 and 1-1-001:044 and appears to straddle Agriculture and Interim
- Bridge #19: TMKs 1-2-004:005 and 1-2-001:003 and appears to be in Interim
- Bridge #39: TMKs 1-2-003:005 and 1-2-003:001 and appears to be in Agriculture
- Bridge #40: TMKs 1-3-002:020 and 1-3-002:023 and appears to be in Agriculture

For Agriculture zoning, it appears that the bridge repairs are a permitted use pursuant to 19.30A.050 Permitted uses A. Principal uses, *7. Retention, restoration, rehabilitation, or improvement of building, sites, or cultural landscapes of historical or archaeological significance.*

For Interim zoning, it appears the proposed bridge improvements are a permitted use pursuant to 19.02A.030 Permitted property uses 4. *The construction of new, or the expansion of existing parks, playgrounds, community centers, or public/quasi-public facilities, owned or operated by private or governmental agencies and tower structures in support of a utility; provided that the utility services the new or expanded park, playground, community center or public/quasi-public facility.*

Hana Highway appears to be the dividing line for the SMA boundary; therefore, an SMA assessment will be required to ascertain if an SMA permit is required.

For the State Land Use District designation, the TMKs appear to be located in the following districts:

- Bridge #2: straddles Agriculture and Conservation
- Bridge #5: straddles Agriculture and Conservation
- Bridge #8: straddles Agriculture and Conservation
- Bridge #19: Conservation
- Bridge #39: Agriculture
- Bridge #40: Agriculture

For proposed bridge repairs in the State Land Use Agriculture District, uses permitted in the highest productivity categories (A or B) are governed by statute. Uses in the lower-productivity categories - C, D, E, or U - are established by the Commission and include those allowed on A or B lands as well as those stated under Section 205.4.5, Hawaii Revised Statutes. For proposed repairs in the State Land Use Conservation District, a Conservation District Use Application (CDUA) may be required.

Thank you for the opportunity to comment on this project. Should you require further clarification, please contact Staff Planner Rachel Beasley by email at rachel.beasley@co.maui.hi.us or by phone at (808) 270-7814.

Sincerely,

Kathleen Ross Aoki

KATHLEEN ROSS AOKI
Planning Director

xc: Ann T. Cua, Planning Program Administrator (PDF)
Candace T. Thackerson, Environmental Planning Supervisor (PDF)
Rachel Beasley, Staff Planner (PDF)

KRA:ATC:RB:lp
K:\WP_DOCS\Planning\RFC\2023\00033_DraftEABridgeImprovement\Comment Letter

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Kathleen Ross Aoki, Planning Director
County of Maui, Department of Planning
One Main Plaza
2200 Main Street, Suite 315
Wailuku, HI 96793

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Ms. Aoki:

Thank you for your comments regarding the subject project transmitted in a letter dated May 11, 2023. The information you shared regarding the County of Maui zoning districts applicable to each of the project bridges, as well as applicable permitted uses, will be included in the Draft Environmental Assessment (Draft EA) for the project. We acknowledge that Hana Highway appears to be the dividing line for the Special Management Area (SMA) boundary. The need for an SMA assessment and potential SMA use permit will be identified as a requirement in the Draft EA. We will consult further with your office as the project progresses regarding the SMA assessment and review process. The Draft EA will also provide information regarding the applicable State Land Use District designations and identify a Conservation District Use Application as a likely project requirement. We are also consulting with the State of Hawaii Department of Land and Natural Resources regarding Conservation District land use reviews and potential authorizations.

We appreciate your participation in the environmental review process and look forward to continued coordination as the project progresses. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

JOSH GREEN, M.D.
GOVERNOR

SCOTT J. GLENN
INTERIM DIRECTOR

235 South Beretania Street, 6th Floor, Honolulu, Hawaiʻi 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaiʻi 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: https://planning.hawaii.gov/

DTS 202304041302NA

Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Branch

April 21, 2023

Mr. Tomasz Kubicz
Project Manager
FHWA-CFLHD
12300 W. Dakota Avenue, Suite 380
Lakewood, Colorado 80228

Dear Mr. Tomasz Kubicz:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment - Hana Highway Bridge Improvements Project, Maui County, HI STP SR360(1).

Thank you for the opportunity to provide comments on your early consultation request for the proposed Hana Highway Bridge Improvement project. The review material was received by our office via memo on April 4, 2023.

It is our understanding that this bridge and roadway improvement project intends to address existing structural deterioration and sub-standard structural conditions of current bridges along Hana Highway. It will do this by making improvements to bridges "under stress" and make repairs. The six bridges involved in this study have been identified as high priority. The bridges do not meet current load capacity standards, were not designed to current seismic and scour standards, and the bridge railings and rail transitions do not meet current crashworthiness requirements. The project would make upgrades, so they remain functional for highway users and the communities that rely on them.

At five of the six bridge locations, Kailua Stream Bridge (Bridge #2), Makanali Stream Bridge (Bridge #5), Puohokomoa Stream Bridge (Bridge #8), ʻUlaʻino Stream Bridge (Bridge #39), and Mokulehua Stream Bridge (Bridge #40); the preferred solution is to retain the existing substructure, including the character-defining abutments and piers, and provide a new single-span structure that spans over the existing supports. The preferred alternative for the remaining bridge, Kopiliula Stream Bridge (Bridge #19), is to retain the existing bridge in its entirety and construct a new, off-alignment bridge *makai* of the existing bridge.

The Office of Planning and Sustainable Development (OPSD) has reviewed the submitted material and has the following comments to offer:

1. Coastal Zone Management Act (CZMA), Federal Consistency
   We note that the proposed action is being conducted in partnership with the Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), and the State of Hawai‘i Department of Transportation (HDOT). The direct involvement by CLFHD, as well as the use of FHWA funds may subject this proposed action to a CZMA federal consistency review.

   OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that CLFHD and/or HDOT consult with our office on the applicable regulations and regulatory process associated with CZMA federal consistency.

2. Hawai‘i Coastal Zone Management (CZM) Program
   The CZM area is defined as “all lands of the State and the area extending seaward from the shoreline to the limit of the State’s police power and management authority, including the U.S. territorial sea” under Hawai‘i Revised Statutes (HRS) § 205A-1.

   Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by FHWA and HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project’s consistency with the policies of the Hawai‘i CZM Program, HRS § 205A-2, as amended.

   Furthermore, the objectives and supporting policies of the Hawai‘i CZM Program serve as the foundation of the enforceable policies of the State of Hawai‘i. Disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

3. Special Management Area (SMA) Use Permitting
   We note that the Hana Highway frequently constitutes the outermost boundary of the SMA as delineated by the County of Maui. If the proposed bridge improvement activity falls within proximity of the ocean side (makai) portion of Hana Highway, we recommend that the County of Maui, Planning Department be consulted on the applicability of SMA Use permitting.

4. Climate Change Adaptation/Sea Level Rise (SLR)
   The project roadways run along the north and eastern coastlines of the island of Maui. Roadway approaches to the bridges may be vulnerable to coastal inundation and natural hazards associated with SLR. These impacts include storm surge, coastal erosion, intense wave action, high winds, and potentially hurricanes. These coastal area threats may

negatively affect the long-term viability the Hana Highway and the bridge spans that serve it. To assess the potential environmental impacts and vulnerability of this facility, we suggest the Draft EA refer to the findings of the Hawai‘i Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawai‘i Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii Sea Level Rise Viewer at https://www.pacioos.hawaii.edu /shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, including setbacks from the shoreline or relocation options further inland, increasing the height of the support facilities to accommodate higher water levels, or various climate change adaptation strategies to respond to impacts of 3.2-foot SLR or greater.

If you have any questions, please contact Joshua Hekekia on Environmental Assessment concerns as they relate to this OPSD response letter at (808) 587-2845; or Debra Mendes on CZMA federal consistency issues at (808) 587-2840.

Sincerely,

for Scott J. Glenn,
Interim Director

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

November 6, 2023

In Reply Refer To:
HFPM-16

Scott Glenn, Interim Director
State of Hawaii, Office of Planning and Sustainable Development
P.O. Box 2359
Honolulu, HI 96813

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Hana Highway Bridge Improvements Project, Maui County, HI
HI STP SR360(1)

Dear Mr. Glenn:

Thank you for your letter dated April 21, 2023, providing comments on the above-referenced project. We offer the following responses in the order presented in your letter:

1. Coastal Zone Management Act (CZMA), Federal Consistency
   The Draft Environmental Assessment (Draft EA) for the project will include CZMA federal consistency review as a requirement. Our office will also consult with the Office of Planning and Sustainable Development (OPSD) to facilitate completion of the CZMA federal consistency review for the project.

2. Hawaii Coastal Zone Management (CZM) Project
   The Draft EA will include a discussion on the project's consistencies with the policies and supporting objectives of the Hawaii CZM program.

3. Special Management Area (SMA) Use Permitting
   The County of Maui (County) Planning Department has been consulted on the applicability of SMA Use permitting. According to the County Planning Department, Hana Highway does appear to be the dividing line for the SMA boundary. Therefore, an SMA assessment will be performed for the project to ascertain if an SMA permit is required.

4. Climate Change Adaptation/Sea Level Rise (SLR)
   The Draft EA will provide a map of the 3.2-foot SLR exposure area in relation to the project area. The project is inland from the coast at elevations ranging from 551 to 1,275 feet above mean sea level and is not located in areas identified as being exposed to sea level rise.

We appreciate your participation in the environmental review process. If you have any questions, please contact me at (720) 963-3498, or by email at tomasz.kubicz@dot.gov.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

Appendix F.

Regulatory Correspondence

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3688
Fax: 720-963-3596
Thomas.W.Parker@dot.gov

April 8, 2019

In Reply Refer To:
HFPM-16

Field Supervisor
U.S. Department of the Interior, U.S. Fish and Wildlife Service
Pacific Islands Fish & Wildlife Office
300 Ala Moana Blvd., Room 3-122
Honolulu, HI 96850

Subject: Hana Highway Bridge Improvements Project
Request for Species/Critical Habitat List under Section 7, Endangered Species Act

Dear Field Supervisor:

The Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is planning to undertake environmental studies for a project to improve six bridges along Hana Highway (Route 360) on the island of Maui. The bridges include the following:

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puohokamoa Stream Bridge (MP 11.0)
- Bridge #19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

The project would improve these six bridges in a context-sensitive manner so they are safe and functional for highway users. Project goals will be refined through the environmental process; however, the project would generally seek to improve the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards. Enclosed with this letter is a project location map with accompanying information on each of the project bridges.

In accordance with Section 7 of the Endangered Species Act, FHWA-CFLHD is requesting a list of threatened, endangered, proposed, and candidate plant and animal species, and designated critical habitats in the project vicinity so that we may assess the potential impacts of the proposed action.

Furthermore, to assist with our assessment, we also respectfully ask for input the USFWS may have in relation to specific avoidance and minimization measures that should be considered for the project. Your response within 30 calendar days of receipt of this letter would be appreciated.

Should you have any questions, please contact Lisa Hemesath, Environmental Protection Specialist, at (720) 963-3473 or by email at Lisa.Hemesath@dot.gov.

Sincerely yours,

Thomas W. Parker
Project Manager

Enclosures:

- Project Location Map
- Project Bridges Fact Sheets

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2019-SL-0262

April 16, 2019

Thomas W. Parker
Project Manager
Federal Highway Administration
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228

Subject: Species List for Proposed Improvement Project for Six Bridges along Hana Highway Bridge, Maui (HFPM-16)

Dear Mr. Parker:

The U.S. Fish and Wildlife Service (Service) received your correspondence on April 8, 2019, requesting information on the presence of endangered or threatened species and critical habitat near the sites for a proposed improvement project at six bridges along the Hana Highway in east Maui.

The project would improve six bridges along the Hana Highway:

- Kailua stream bridge at mile post 5.9
- Makanali stream bridge at mile post 8.2
- Puohokamoa stream bridge at mile post 11.0
- Kopiliula stream bridge at mile post 21.7
- ʻUlaʻino stream bridge at mile post 27.9
- Mokulehua stream bridge at mile post 28.3

The exact details and goals of the project will be defined through the environmental review process; however, in general, the project will seek to ensure the bridges are more consistent with current standards. Particular attention will be paid to load capacity, bridge railing and transitions, bridge width, and seismic standards.

Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Project, there are seven listed species that may occur in the vicinity of the project area (Table 1). There is no proposed or final critical habitat within the vicinity of the project area. However, there is critical habitat for five species downstream of both the Puohokamoa and Kopiliula bridges along the coast. These units are critical habitat for the plant species: *Brighamia rockii*, *Cyperus pennatiformis*, *Ischaemum byrone*, *Peucedanum sandwicense*, and *Vigna o-wahuensis*. We recommend that the attached

best management practices for working in aquatic environments are followed to reduce potential impacts to these species.

Table 1 – Listed species in the vicinity of the project area.

Common Name	**Scientific Name**	**Status**
Hawaiian hoary bat	*Lasiurus cinereus semotus*	Endangered
Hawaiian petrel	*Pterodroma sandwichensis*	Endangered
band-rumped storm-petrel	*Oceanodroma castro*	Endangered
Hawaiian Pacific damselfly	*Megalagrion pacificum*	Endangered
flying earwig damselfly	*Megalagrion nesiotes*	Endangered
Hawaiian stilt	*Himantopus mexicanus knudseni*	Endangered
Newell's shearwater	*Puffinus newelli*	Threatened

All six streams in this project are high value, perennial streams and therefore have migratory diadromous stream biota. Diadromous is a general category describing fish that spend portions of their life cycles partially in fresh water and partially in salt water. We offer the following recommendations to avoid and minimize project impacts to listed species pursuant to the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq*.) and diadromous stream biota.

Hawaiian hoary bat:
The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away. Additionally, Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Seabirds (Hawaiian petrel, Newell's shearwater, and band-rumped storm-petrel):
Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following applicable measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.

- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian stilt:
Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation.

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following applicable measures into your project description:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
- Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Hawaiian damselflies:
Hawaiian damselflies are found in aquatic habitats across the islands, with high species endemism within islands. Breeding habitat includes anchialine pools, perennial streams, marshes, ponds, and even artificial pools and seeps. Major threats include introduced fish, amphibians, and invertebrates in streams, reduced stream flow from drought and water diversion, small isolated populations, reduced habitat quality from ungulates and nonnative plants, and possibly over-collection.

- The U.S. Fish and Wildlife Service Recommended Standard Best Management Practices for Work in Aquatic Environments should be incorporated into the project description to minimize the degradation of water quality and impacts to fish and wildlife resources.
- Permits are required for accurate surveys of this species, so consult with the Service if work will be done in proximity to stream areas or within water bodies.

Thank you for your efforts to conserve listed species and native habitats. Please contact Fish and Wildlife Biologist John Vetter (808-792-9406, email: john_vetter@fws.gov) if you have any questions or for further guidance.

Sincerely,

Michelle Bogardus
Island Team Manager
Maui Nui and Hawaii Island

Recommended Standard Best Management Practices for Aquatic Habitats

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see http://www.haccp-nrm.org/Wizard/default.asp) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

December 12, 2019

In Reply Refer To:
HFPM-16

Mr. David Smith, Administrator
State of Hawaii Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl St. Room 325
Honolulu, HI 96813

Subject: Hana Highway Bridge Improvements Project
Request for Information

Dear Mr. Smith:

The Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is performing engineering and environmental studies for a project to improve six bridges along Hana Highway (Route 360) on the island of Maui. The bridges include the following:

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puohokamoa Stream Bridge (MP 11.0)
- Bridge #19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

The project would improve these six bridges in a context-sensitive manner so they are safe and functional for highway users. Project goals will be refined through the environmental process; however, the project would generally seek to improve the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards. Enclosed with this letter is a project location map with accompanying information on each of the project bridges.

To aid our assessment of this project, please share with us any input, comments, or information you may have regarding the project, surrounding area, or resources that may be affected. We would also appreciate information regarding known or potential presence of protected species or habitats in the project vicinity, as well as any specific avoidance or minimization measures that should be considered for the project. Your response within 30 calendar days of receipt of this letter would be appreciated.

Should you have any questions, please contact Lisa Hemesath, Environmental Protection Specialist, at (720) 963-3473 or by email at Lisa.Hemesath@dot.gov.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

Enclosures:

- Project Location Map
- Project Bridges Fact Sheets

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

MAR 2 1 2020

Log no. 2415

J. Michael Will
U.S. Department of Transportation, Federal Highway Administration
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228

Dear J. Michael Will:

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for information for the proposed Hana Highway (Route 360) bridge improvements project on the island of Maui, Hawai'i. Proposed work would include structural improvements to meet current standards and guidelines for load capacity, railings, transitions, width, and seismic events and would occur on six bridges: Kailua Stream Bridge (Bridge #2), Makanali Stream Bridge (Bridge #5), Puohokamoa Stream Bridge (Bridge #8), Kopiliula Stream Bridge (Bridge #19), Ulaino Stream Bridge (Bridge #39), and Mokulehua Stream Bridge (Bridge #40).

The project work could affect native plants and wildlife, including species listed in the State endangered species law, Chapter 195D, Hawaii Revised Statutes. Therefore, DOFAW recommends that surveys should be conducted by a qualified biologist to determine if listed species are present in the project area and to assess any potential impacts to those species.

The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW. Barbed wire should be avoided for any construction because bat mortalities have been documented as a result of becoming ensnared by barbed wire during flight.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea.

Best management practices at the work sites should include containing all food, refuse, and organic matter to minimize predator presence, and providing covered trash receptacles. Work at all times shall avoid release of sedimentation, soil, or other harmful materials into streams that flow through Forest Reserve lands. Any work planned for Forest Reserve lands will require a Special Use Permit pursuant to Chapter 13-104, Hawaii Administrative Rules.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Jim Cogswell, Wildlife Program Manager at (808) 587-4187 or James.M.Cogswell@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

April 22, 2019

In Reply Refer To:
HFPM-16

Mr. Brian Neilson, Administrator
State of Hawaii Division of Aquatic Resources
1151 Punchbowl St. Room 330
Honolulu, HI 96813

Subject: Hana Highway Bridge Improvements Project
Request for Information

Dear Mr. Neilson:

The Federal Highway Administration (FHWA), Central Federal Lands Highway Division (CFLHD), in cooperation with the Hawaii Department of Transportation (HDOT), is performing engineering and environmental studies for a project to improve six bridges along Hana Highway (Route 360) on the island of Maui. The bridges include the following:

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puohokamoa Stream Bridge (MP 11.0)
- Bridge #19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

The project would improve these six bridges in a context-sensitive manner so they are safe and functional for highway users. Project goals will be refined through the environmental process; however, the project would generally seek to improve the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards. Enclosed with this letter is a project location map with accompanying information on each of the project bridges.

To aid our assessment of this project, please share with us any input, comments, or information you may have regarding the project, surrounding area, or resources that may be affected. We would also appreciate information regarding known or potential presence of protected species or habitats in the project vicinity, as well as any specific avoidance or minimization measures that should be considered for the project. Your response within 30 calendar days of receipt of this letter would be appreciated.

Should you have any questions, please contact Lisa Hemesath, Environmental Protection Specialist, at (720) 963-3473 or by email at Lisa.Hemesath@dot.gov.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

Enclosures:

- Project Location Map
- Project Bridges Fact Sheets

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: May 15, 2020
DAR # 6118

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Skippy Hau, Aquatic Biologist

SUBJECT: Hana Highway Bridge Improvement Project

Request Submitted by: J. Michael Will, P.E. Project Manager

Location of Project: Bridges along Hana Highway

Brief Description of Project:

This project will make improvements so highway bridges are safe and functional for highway users. It should make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

Comments:

☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: May 18, 2020

Brian J. Neilson
DAR Administrator

DAR# 6118

Comments

This week, Jody Kimmel and I conducted inspections of the bridges listed for this project. We fully support the proposed improvements and modifications to increase the safety and increased capacity of these bridges.

On May 12, we visited the Mokulehua Stream Bridge and found standing water. We used the sonde to measure water quality in a pool upstream of the bridge.

We inspected the Ulaino (Honomaele) Stream bridge. This stream flows intermittently and standing water was seen in isolated pools. Makai of the bridge is a large pandanus (lauhala tree). We want to relay a neighbor's concern for the large healthy hala tree. He felt this plant should be protected. {Due to disease, many of the lauhala from Keanae to Hana appear to be in a weakened state.}

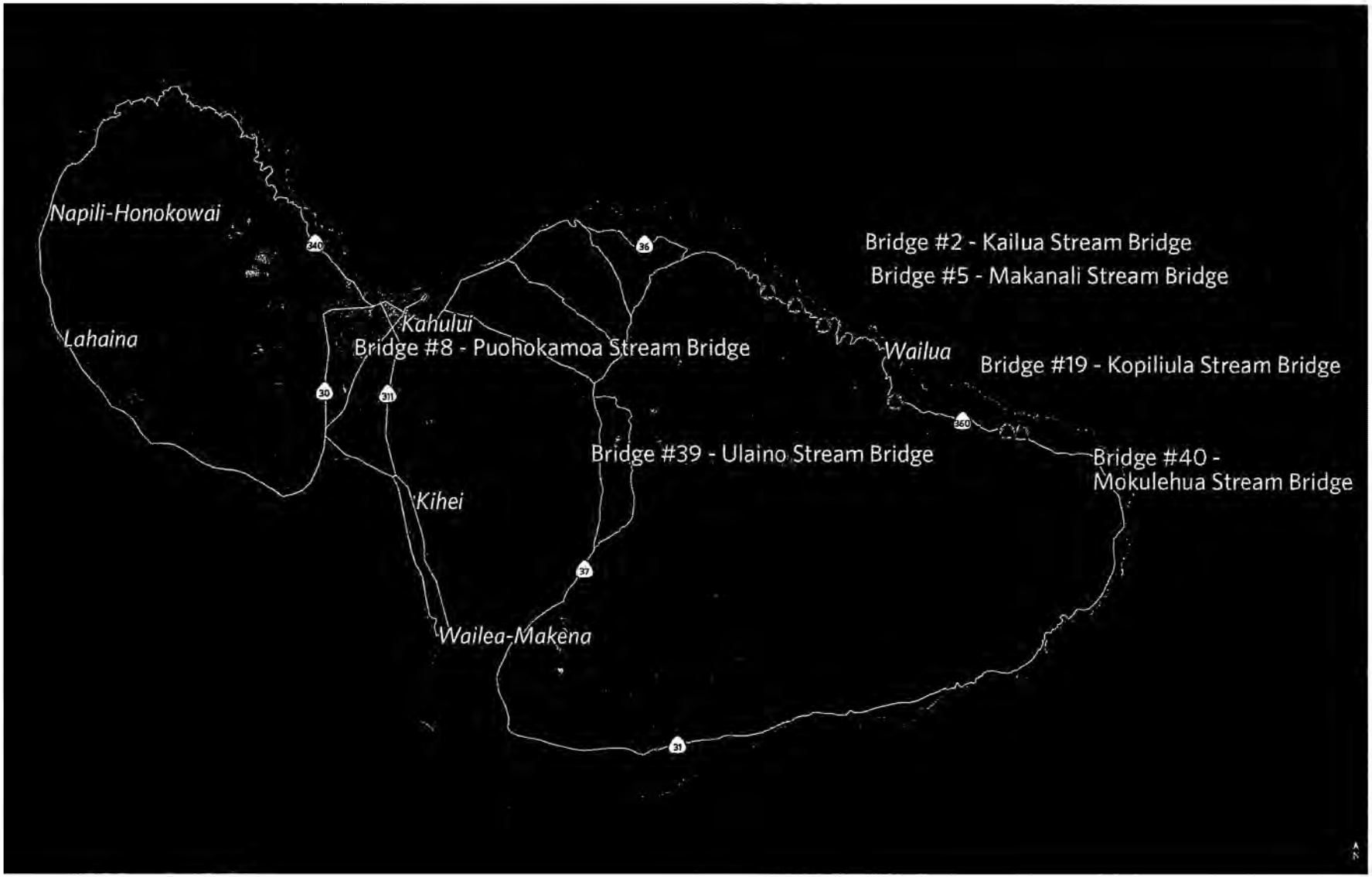
We inspected the Makanali Stream Bridge. Water was flowing in the irrigation ditch where we found prawns (Macrobrachium lar), and guppies (Poecilia reticulata). There was a metal diversion which keeps the irrigation ditch flowing.

On May 13, we inspected Kopili'ula Stream. We measured flow and took water quality measurements. We sampled 77 opae in a pool upstream of the ditch and diversion. The opae averaged 39.6 mm total length. The smallest was 32.7 and largest was 49.6 mm.
Flow was estimated to be 3.8 CFS or 2.46 MGD.

We inspected Puohokamoa Stream and measured 16.55 CFS or 10.7 MGD flow.
We found a large tree straddled by the bridge. This tree needs to be removed before debris begins to accumulate and form a dam.

On May 14, we inspected Kailua Stream. We measured 1.23 CFS or 0.79 MGD flow. 17 guppies (Poecilia reticulata) averaged 38.0 mm total length and 1.01 g total weight. Two prawns (Macrobrachium lar) were also caught. One was a berried female (carrying eggs). The prawns averaged 101.6 mm total length and 13.91 g total weight.

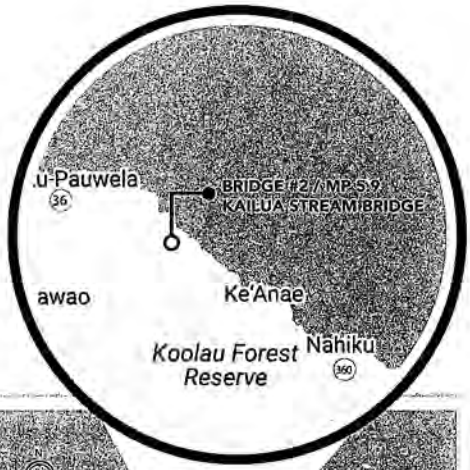
Hana Highway Bridge Improvements Project: Bridge Locations

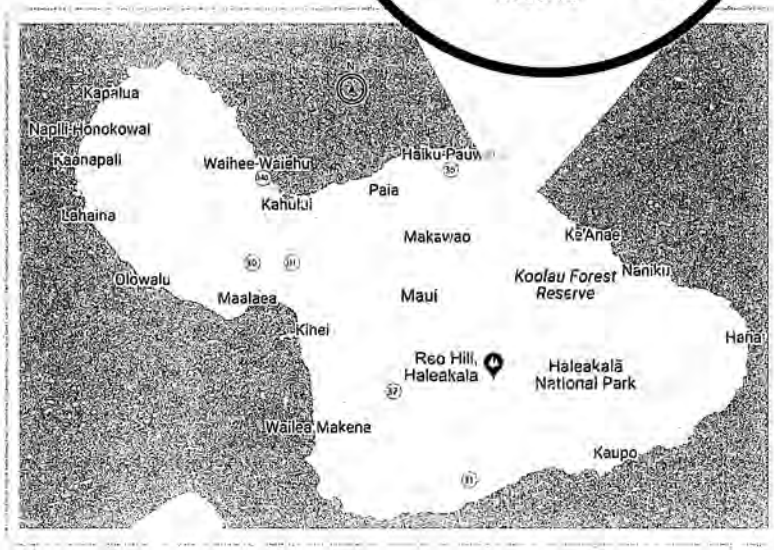


HANA HIGHWAY
BRIDGE IMPROVEMENTS

KAILUA STREAM BRIDGE 02

Photo courtesy of FAI





Bridge Name
Kailua Stream Bridge

Milepost
5.9

Year Built
1929

Maximum Load
10 ton

Bridge Length
40.03 ft.

Span Length
39.04 ft.

Width (curb to curb)
20.34 ft.

Bridge Type:
Concrete Tee Beam

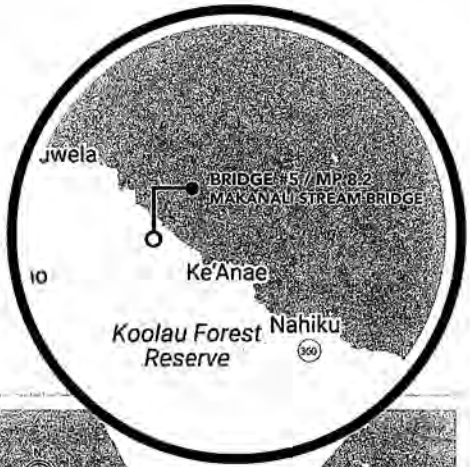
Number of Spans: 1

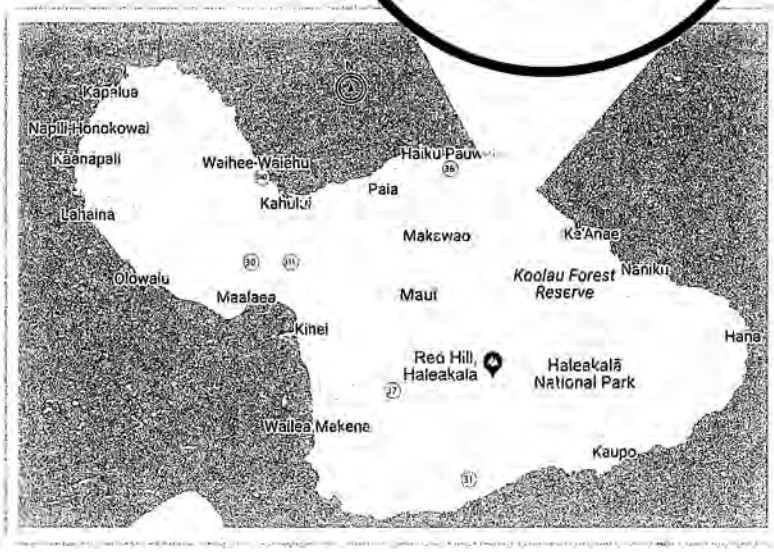
Rail Type
Concrete Open Vertical

Adjacent TMKs
2-2-9-010-001, 2-2-9-014-001,
2-2-9-012-041, 2-2-9-013-015

HANA HIGHWAY
BRIDGE IMPROVEMENTS

MAKANALI STREAM BRIDGE 05





Bridge Name
Makanali Stream Bridge

Milepost
8.2

Year Built
1928

Maximum Load
10 ton

Bridge Length
18.04 ft.

Span Length
13.12 ft.

Width (curb to curb)
16.40 ft.

Bridge Type:
Concrete Slab

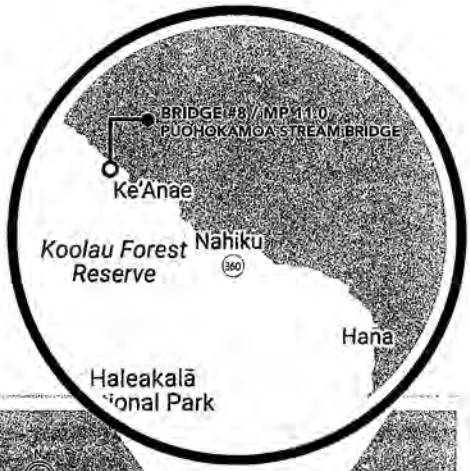
Number of Spans: 1

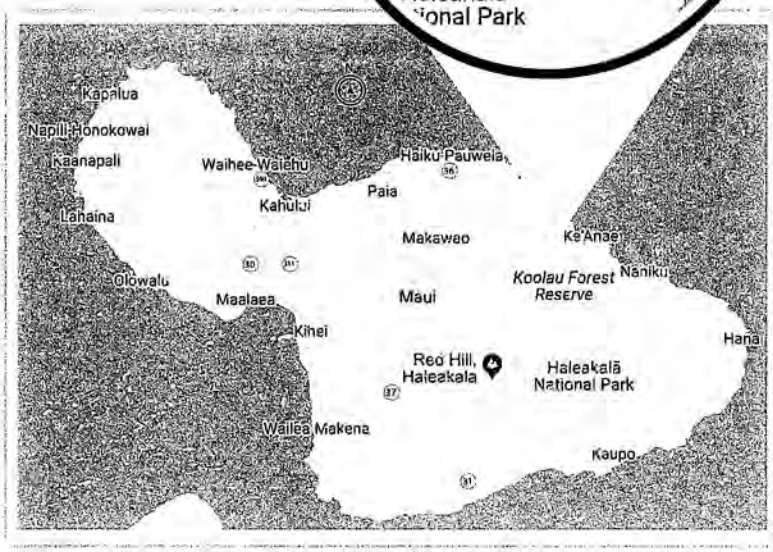
Rail Type
Concrete Open Vertical

Adjacent TMKs
2-1-1-001-042, 2-1-1-001-036

HANA HIGHWAY
BRIDGE IMPROVEMENTS

PUOHOKAMOA STREAM BRIDGE 08





Bridge Name
Puohokamoa Stream Bridge

Milepost
11.0

Year Built
1912

Maximum Load
10 ton

Bridge Length
56.10 ft.

Span Length
24.93 ft.

Width (curb to curb)
15.09 ft.

Bridge Type:
Concrete Tee Beam

Number of Spans: 2

Rail Type
Soild Reinforced
Concrete Parapet

Adjacent TMKs
2-1-1-001-023, 2-1-1-001-044,
2-1-1-001-022, 2-1-1-001-052

HANA HIGHWAY
BRIDGE IMPROVEMENTS

KOPILIULA STREAM BRIDGE 19

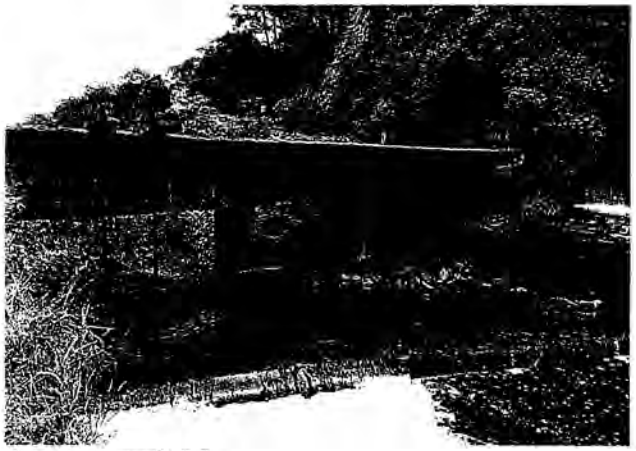
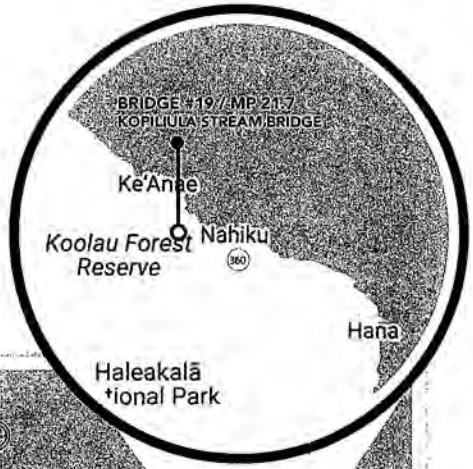
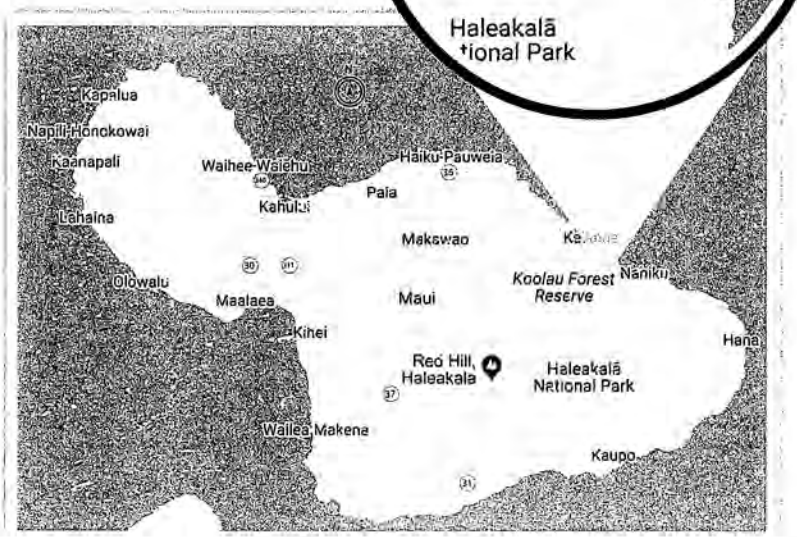


Photo courtesy of NOEI





Bridge Name
Kopiliula Stream Bridge

Milepost
21.7

Year Built
1926

Maximum Load
10 ton

Bridge Length
77.10 ft.

Span Length
33.14 ft.

Width (curb to curb)
14.44 ft.

Bridge Type:
Concrete Girder

Number of Spans: 2

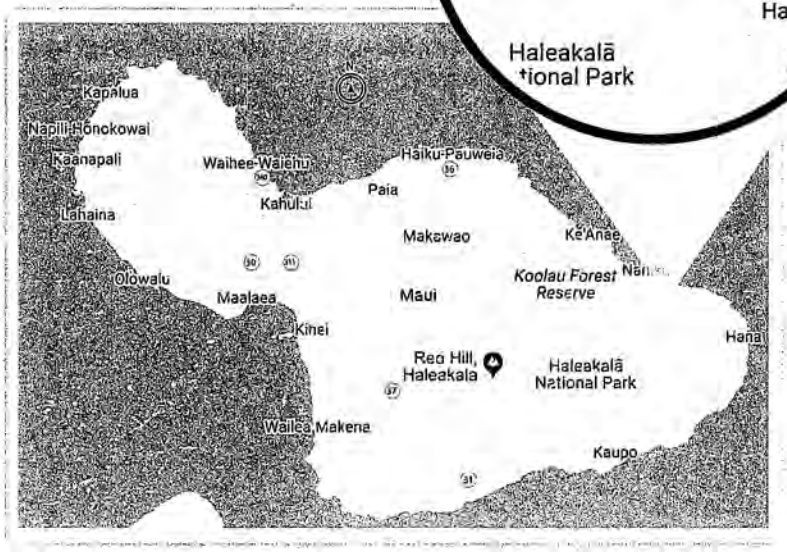
Rail Type
Concrete Solid

Adjacent TMKs
2-1-2-001-003, 2-1-2-004-005

HANA HIGHWAY
BRIDGE IMPROVEMENTS

ULAINO STREAM BRIDGE 39

Photo courtesy of NOEI



Bridge Name
Ulaino Stream Bridge

Milepost
27.9

Year Built
1914

Maximum Load
10 ton

Bridge Length
39.04 ft.

Span Length
18.04 ft.

Width (curb to curb)
16.40 ft.

Bridge Type:
Concrete Tee Beam

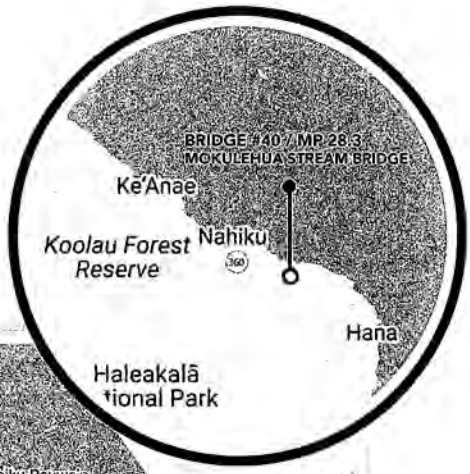
Number of Spans: 2

Rail Type
Concrete Open Vertical

Adjacent TMKs
2-1-2-003-005, 2-1-2-003-001

MOKULEHUA STREAM BRIDGE 40

Photo courtesy of FAI



Bridge Name
Mokulehua Stream Bridge

Milepost
28.31

Year Built
1908

Maximum Load
10 ton

Bridge Length
47.90 ft.

Span Length
14.11 ft.

Width (curb to curb)
13.78 ft.

Bridge Type:
Concrete Slab

Number of Spans: 3

Rail Type
Concrete Solid

Adjacent TMKs
2-1-2-003-005, 2-1-2-003-001,
2-1-3-002-023, 2-1-3-002-020

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 Ala Moana Boulevard, Rm. 3-122
Honolulu, Hawaii 96850

July 15, 2021

Sandy Beasley
AICP, Environmental Manager
HDR
1670 Broadway, Suite 3400
Denver, CO 80202

Dear Mr. Beasley

The U.S. Fish and Wildlife Service (Service) is providing this Draft Fish and Wildlife Coordination Act Planning Aid Report to you in your capacity as the consultant to the U. S. Department of Transportation, Federal Highway Administration, Central Federal Lands Highway Division, for the Hana Highway Bridge Improvements Project, along the Hana Highway on the island of Maui, Hawaii.

The Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 et seq.; 48 Stat. 401], as amended (FWCA), was established to provide a basic procedural framework for the orderly consideration of fish and wildlife conservation measures to be incorporated into federally funded or permitted projects that present potential impacts to aquatic resources. This report has been prepared under the authority of and in accordance with provisions of the FWCA, the Federal Clean Water Act of 1977 [33 U.S.C. 1251 et seq.; 62 stat. 1155], as amended (CWA), and the Endangered Species Act [16 U.S.C 1531 et seq.], as amended (ESA). These comments are also consistent with the National Environmental Policy Act of 1969 [42 U.S.C. 4321 et seq.; 83 Stat. 852], as amended, and other authorities mandating the Service's review of projects and provision of technical assistance to conserve trust resources.

This report was prepared by the Service in coordination with the State of Hawaii's Department of Land Natural Resources, Division of Forestry and Wildlife.

We appreciate the opportunity to provide input on the proposed project. If you have any questions regarding the report, please contact Fish and Wildlife Biologist Dan Polhemus at 808-779-4202, or dan_polhemus@fws.gov.

Sincerely,

for Earl Campbell
Field Supervisor

Phase 1 Aquatic Resources Habitat Characterization
Hana Highway Bridge Improvements
Maui Is., Hawaii

Planning Aid Report - Fish & Wildlife Coordination Act

DRAFT REPORT **June 2022**

Prepared for

U. S. Department of Transportation
Lakewood, Colorado

Prepared by

Dan Polhemus
U. S. Fish & Wildlife Service
Pacific Islands Fish & Wildlife Office
Honolulu, Hawaii

Polhemus, D. A. 2022.

Phase 1 Aquatic Resources Habitat Characterization: Hana Highway Bridge Improvements, Maui Is., Hawaii

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

Fish and Wildlife Coordination Act Planning Aid Report

June 2022

Cover: Puohokamoa Stream bridge, Hana Highway, Maui, Hawaii.

DRAFT

FISH AND WILDLIFE COORDINATION ACT
PLANNING AID REPORT

HANA HIGHWAY BRIDGE IMPROVEMENTS
MAUI IS., HAWAII

Prepared by:

DAN A. POLHEMUS

U.S. Department of the Interior
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii

Prepared for:

HDR
Denver, CO
Acting as agent for
U. S. Department of Transportation
Federal Highways Administration

June 2022

TABLE OF CONTENTS

INTRODUCTION

Authority, Purpose and Scope

The current document constitutes the U.S. Fish and Wildlife Service's (Service) Draft Planning Aid Report on plans developed by the U.S. Department of Transportation, Federal Highway Administration (FHA), for structural rehabilitation of six historic bridges along the Hana Highway, located on the island of Maui, Hawaii (Figs. 1, 4). This report has been prepared under the authority of the Fish and Wildlife Coordination Act of 1934 (FWCA) [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, and other authorities mandating Department of the Interior (DOI) coordination to minimize impacts from federal projects. This report is also consistent with the National Environmental Policy Act of 1969 (NEPA) [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended and the Endangered Species Act of 1973 [16 U.S.C. 1531 *et. seq.*; 87 Stat. 884], as amended (ESA). The report has also been prepared in coordination with the State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife, (DOFAW), and its findings incorporate their recommendations as well as those of the Service.

The purpose of this report is to document existing fish and wildlife resources at the proposed project sites and to ensure that conservation of fish and wildlife conservation trust resources receives equal consideration with other proposed project objectives as required under the FWCA. The report includes an assessment of conspicuous diurnal fish and wildlife resources at the proposed project sites, an evaluation of potential impacts associated with the proposed alternative actions, and recommendations for fish and wildlife mitigation measures.

The overall purpose of the proposed bridge repairs is to ensure that the ageing bridges are more consistent with current highway safety standards. The project will improve these six bridges in a context-sensitive manner so that they are safe and functional for highway users. Although the project goals are still being defined through the environmental review process, the project would generally seek to improve the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards. Pursuant to correspondence dated 11 February 2019, and 16 April 2019, the FHA invited the Service to provide information on threatened, endangered, proposed and candidate species in the project vicinity, associated critical habitat, and recommendations to avoid or minimize impacts that might result from this proposed project. The FHA was subsequently advised that their actions triggered compliance under FWCA and provided funding to the Service via their contracted consultant, HDR, for surveys of aquatic trust resources in the project area.

Field surveys to assess the potential environmental impacts of this project were originally scheduled for March of 2020, but work was curtailed due to logistical constraints imposed by the global coronavirus pandemic. Over the past two years the Service has continued to coordinate closely through e-mail with representatives of HDR, the consulting firm undertaking the environmental compliance documentation for this project on behalf of the U.S. Department of Transportation, to discuss the proposed project alternatives and progress on other aspects.

Copies of this draft report are being provided to the National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NOAA-NMFS), the U.S. Environmental Protection Agency (EPA), and DOFAW.

Prior Fish and Wildlife Service Studies and Reports

The Service has not undertaken any field studies or prepared any previous FWCA reports regarding this proposed action but has undertaken a considerable number of field surveys in streams along the Hana Highway over the past 30 years, due to the presence of ESA-listed native *Megalagrion* damselfly species in that area. Due to travel restrictions occasioned by the currently ongoing global coronavirus pandemic, field work to undertake supplemental surveys and direct observations of the proposed project footprints, originally scheduled for early 2020, were delayed until April 2022. The current report utilizes these recent field observations, along with existing information available from scientific literature, and internal Service work products from recent surveys in the area (Polhemus, 2019).

Hydrological assessment work related to specific streams proposed for action in the project area was undertaken by the Hawaii State Commission on Water Resource Management (CWRM) in relation to the setting of Interim Instream Flow Standards (CWRM 2009a, 2009b, 2020), and by the U. S. Geological Survey (Gingerich, 2009). In addition, faunal surveys in support of these proposed instream flow standards were also undertaken by the State of Hawaii, Department of Land and Natural Resources, Division of Aquatic Resources (DAR) along certain streams proposed for action (Higashi *et al.* 2009a, Higashi *et al.* 2009b), building upon information previously compiled by DAR in the Maui volume of their *Atlas of Hawaiian Watersheds* (Parham *et al.* 2008). Terminology for stream reach classifications follows that of Polhemus *et al.* (1992). Catchment petrology was evaluated using the geological map of Maui produced by Sherrod *et al.* (2007).

DESCRIPTION OF THE PROJECT AREA

The project area lies on the northeastern flank of Haleakala volcano on East Maui and extends form Kailua Stream in the northwest to Mokulehua Stream in the southeast. All six of the bridge sites surveyed lie in areas that receive high annual rainfall, ranging from 137 to 225 inches per year, based on both rain gauge records, and supplemental modelling obtained from the online Rainfall Atlas of Hawaii (Giambelluca et al. 2013). Three of the study sites are on streams that were formerly gauged, although none of these gauges are currently active, and their hydrographs reflect flashy discharge patterns with a significant range of variation in total flow. Exemplar hydrographs are provided for these 3 systems for the years 1955-1957 (Figs. 2, 3, 5)**,** because this is the most recent period congruently spanned by all 3 gauges. Two of the systems under study, Ulaino and Mokuleha, exhibit intermittent flow at the elevation of the Hana Highway, going dry and retaining only remnant pools during certain summer months.

The six bridge sites under study fall into two discrete geographical sets of three bridges, lying west and east of the Koolau Gap respectively. The locations of the three western bridges are shown in Fig. 1 below and discussed subsequently.

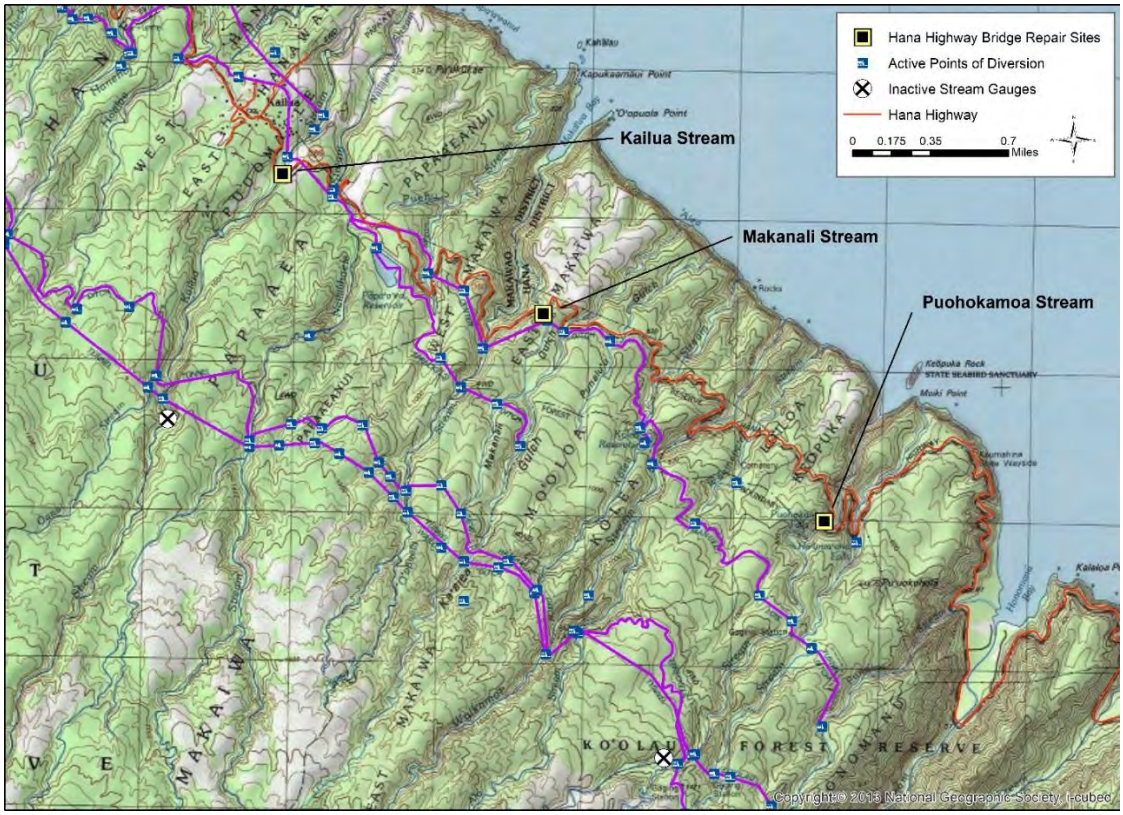


Fig. **1**. Map of the western sector of the windward coast on Haleakala, Maui, showing the locations of bridges proposed for repair at Kailua, Makanali, and Puohokamoa streams. The Hana Highway is shown in red; ditch system alignments are shown in purple; current and former points of diversion are indicated by small blue-and-white squares; and former gauging stations are indicated by white circles with crosses.

Kailua Stream Catchment

Kailua Stream originates near 4500 ft elevation on the flanks of Puu O Kekae, an eroded secondary cone on the windward flank of Haleakala. The stream follows a largely linear course for approximately 6 miles, being joined above 2400 ft elevation by two small east-bank tributaries, and at 1200 ft by the major Ohanui Stream (spelled Oanui on USGS topographic maps) tributary from the west. The stream is heavily incised along portions of its midreach, with several high falls, and enters the ocean via a set of waterfalls at its seaward terminus, where it is nearly confluent with Nailiilihaele Stream, which occupies the catchment immediately to the west. As such, Kailua Stream lacks a terminal reach or estuary.

The Kailua Stream catchment contains five points of diversion, three of them above the bridge repair site, and two below. In the upstream direction, the Wailoa Ditch diverts water from the Ohanui Stream tributary at Intake W-16 and from the main stem of Kailua Stream at Intake W-15, both of which lie near 1250 ft elevation and are currently active. At about 1200 ft elevation the New Hamakua Ditch diverts water from the Ohanui tributary immediately above its confluence with the main stem Kailua at Intake NH-14, which is also currently listed in active status. Downstream of the Hana Highway, Kailua Stream is diverted at about 680 ft elevation by

Intake L-2 on the Lowrie Ditch; and at about 500 ft elevation by Intake H-1 on the Haiku Ditch. Recent observations indicate that these latter ditches are not in good repair, and the status of these latter intakes is uncertain, although they may still represent barriers to diadromous faunal passage. In addition, another barrier may be imposed by the small Kailua Reservoir lying near 550 ft elevation and linked to the Haiku Ditch system.

The bed of the stream below the Ohanui confluence runs in scoured bedrock channel of Hana series lavas less than 100,000 years old, a narrow finger of which flowed into the gulch from the Puu O Kakae vent upslope. This section of the stream below 1000 ft elevation thus has a poorly developed hyporheic zone, and little buffering capacity for flash floods. As a result of natural topographic barriers, as well as artificial barriers imposed by multiple points of ditch diversion, Kailua Stream at the elevation of the Hana Road supports limited diadromous macrofauna.

An active rainfall gauge is present at the East Maui Irrigation Company baseyard near the Hana Highway bridge at 700 ft elevation. This gauge has a 120-year period of record, from 1902 to the present, and with a mean annual rainfall of 193 inches. Estimated rainfall at higher elevations in this catchment, based on the online Rainfall Atlas of Hawaii (http://rainfall.geography.hawaii.edu/), is on the order of 225 inches per year.

There are no current stream gauging stations on Kailua Stream, although this catchment has in the past been gauged at three points:

a) USGS gauge 16574000, lying at 3080 ft elevation, with coordinates 20°49'58"N 156°14'15"W. This gauge had a 17-year period of record, from 1918-1934.

b) USGS gauge 16574500, lying at 2480 ft elevation, with coordinates 20°50'16"N 156°14'14"W. This gauge had a 9-year period of record, from 1963-1971.

c) USGS gauge 16577000, lying at 1250 ft elevation, with coordinates 20°52'23"N 156°13'15"W. This gauge had a 46-year period of record, from 1913-1958. This is by far the longest-duration hydrograph for this system, and reveals that total flow varied widely, from a high of 2000 cubic feet per second (cfs) to a low of 0.2 cfs. The hydrograph provided here, spanning the years 1955-1957, is indicative of these patterns, showing that stream discharge contracts significantly during the summer months, but that the stream never goes completely dry at the Hana Highway bridge. Using the data from USGS gauge 16577000, CWRM calculated a TFQ_{50} (the total flow that is equaled or exceeded 50 percent of the time) of 7.8 cfs in the vicinity of the Hana Highway bridge, with a mean flow of about 30 cfs (CWRM 2020).

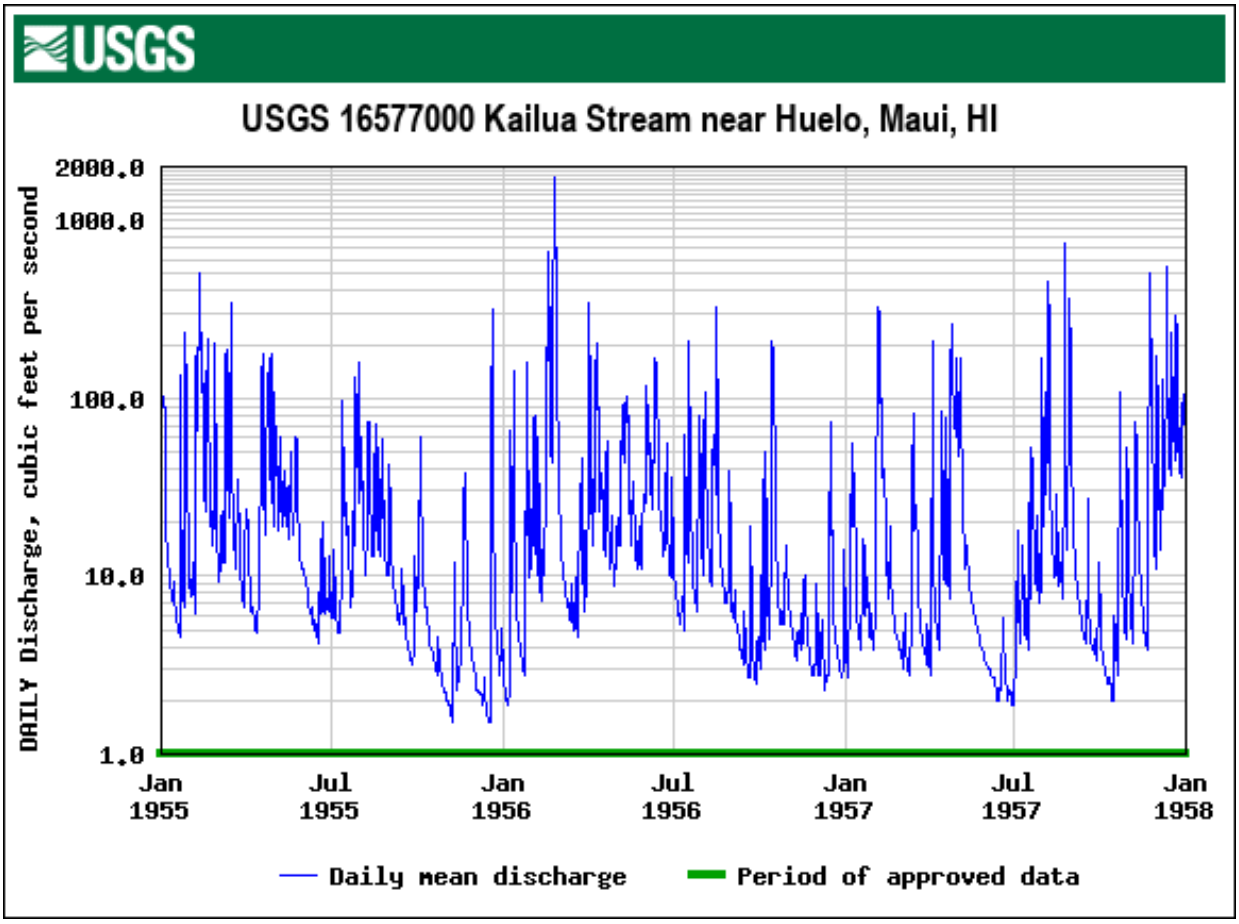


Fig. **2**. Exemplar hydrograph for Kailua Stream spanning the years 1955-1957, and showing the wide variations in discharge rate, and the generally lower pattern of discharge during the drier summer months from May through August. (from online data provided by the USGS Water Resources Division).

During the present survey, Kailua Stream was visited on 25 April 2022 from 9:45-10:45 AM in partly cloudy weather, with one passing rain shower and then full sun. Faunal observations were made in the vicinity of the Hana Highway bridge, and for approximately 100 ft upstream and 300 ft downstream (Figs. 7-10). The area immediately beneath the bridge consisted of a quiet pool up to 3 ft deep, floored with water-rounded rocks and gravel. The stream reach above the bridge consisted of large boulders overtopped with hau (*Hibiscus tiliaceus*) which inhibited progress. The stream reach below the bridge was a more open channel in bedrock, bordered by Job's tears (*Coix lachryma-jobi*), with long pools up to 3 ft deep, eventually leading to the lip of a waterfall with a large plunge pool below. The water temperature in flowing sections was 22° C. The stream flow was low, possibly due to upstream diversions, and no fishes, either native or introduced, were observed. It is speculated that the upstream migration of diadromous species along Kailua Stream may be potentially blocked by diversion structures and a reservoir further downstream. A full list of aquatic species observed here can be found in Table 1.

Makanali Stream Catchment

Makanali Stream occupies a relatively short and compact elevation, with headwaters near 1400 ft elevation. This stream is a tributary to the Oopuola Stream, which occupies the next catchment to the east, with the two streams confluencing in a deep valley below the Hana Highway at about 200 ft elevation before reaching the sea at Makaiwa Bay. In contrast to many streams in this sector, the lower section of the combined Makanali-Oopuola catchment has a well-developed terminal reach, and a short estuary that forms seasonally behind the rock and cobble bar at the stream mouth, rendering it favorable for the recruitment of diadromous species.

There are four points of diversion along Makanali Stream, all lying upstream of the Hana Highway bridge. The first of these is Intake C-6 on the Center Ditch, at around 720 ft elevation, followed by Intake S-12 on the Spreckels Ditch near 920 ft, then Intake NH-4 on the New Hamakua Ditch at 1240 ft, and finally Intake W-7 on the Wailoa Ditch at 1320 ft. It is not clear if all of these intakes are currently in operation at the present time.

The bed of Makanali Stream runs in Kula series basalts, which tend to form channels with complex mixes of substrate types and does not exhibit any secondary infilling by Hana series basalts.

There are no active rainfall gauges in the vicinity of Makanali Stream. Estimated rainfall at the Hana Highway bridge, based on the online Rainfall Atlas of Hawaii, is 137 inches per year, with higher elevations in the catchment receiving up to 187 inches per year.

Makanali Stream has never been gauged, and no hydrograph is available for this site.

During the present survey, Makanali Stream was visited on 25 April 2022 from 11:00 AM until noon, in partly cloudy weather with filtered sunlight through thin overcast. Faunal observations were made in the vicinity of the Hana Highway bridge, and for approximately 500 ft upstream and 300 ft downstream (Figs. 11-14). The area immediately beneath the bridge consisted of riffles and shallow pools amid water-rounded rocks and gravel. The stream reach above the bridge was initially blocked by a tangled treefall, with a diversion structure further upstream impounding a small, deep pool bordered by Job's tears and honohono grass (*Commelina diffusa*). Beyond this in an upstream direction the stream exhibited a stair-step profile of small cascades and pools over bedrock, with about 50 percent shading. The stream reach below the bridge was a more open channel in bedrock, with a series of runs leading to the lip of a waterfall at least 50 ft high. The water temperature in flowing sections was 22° C. The stream flow was low, possibly due to upstream diversions, and introduced topminnows (Poeciliidae) were observed as far upstream as the survey party ventured. The native damselfly *Megalagrion hawaiiense* was observed perching on vegetation along the margins of the pool impounded by the diversion. A full list of aquatic species observed here can be found in Table 1.

Puohokamoa Stream Catchment

Puohokamoa is a rather large catchment, with its headwaters lying near 4600 ft elevation. The main stream channel is 6.1 miles in length, and has several major tributaries, the first entering from the east bank near 2100 ft elevation, and another entering from the west at about 1300 ft,

just above the Wailoa Ditch point of diversion. Downstream of the Hana Highway the stream passes over a high waterfall and occupies a deeply incised valley, entering the sea over a rock and cobble bar.

There are six points of diversion along Puohokamoa Stream, all lying upstream of the Hana Highway bridge. The first of these is Intake UF-2 on the Upper Kula Water System (also known as the Waikamoi Flume), lying at 4100 ft. Below this in succession, moving downstream, are the following additional intakes: and un-named ditch intake at 2250 ft.; Intake S-9 on the Spreckels Ditch, at 1360 ft.; Intakes K-33 and K-33a on the Wailoa Ditch at 1280 ft.; and Intake ML-3 on the Manuel Luis Ditch at 900 ft.

The three main headwater branches of Puohokamoa Stream exhibit a mix of gaining a losing reaches between 3200 and 2400 ft, then have gaining reaches between 2400 and 1300 ft due to groundwater influx, then becoming very weakly gaining from 1300 ft down to 500 ft (Gingerich, 1999). Like adjacent Waikamoi Stream to the west, Puohokamoa is a losing system in its terminal reach below 500 ft because the bed here is underlain Honomanu basalt, which is unsaturated in this sector west of the Koolau Gap and thus creates losses due to infiltration. As a result, the terminal reach can run dry in the summer months, a pattern further compounded by the many layers of diversions upstream. The transition to the Honomanu series is marked by the high waterfall at the head of the deeply incised lower valley, about 0.2 miles downstream of the Hana Highway bridge.

There are no active rainfall gauges in the vicinity of the Puohokamoa Stream bridge, but estimated rainfall at the Hana Highway, based on the online Rainfall Atlas of Hawaii, is 147 inches per year. The active rainfall gauge Puohokamoa 2 is present in the upper section of the catchment at 2980 ft elevation, with 91 years of record from 1931 to present, and a mean annual rainfall of 259 inches.

Due to its multiple converging branches which produced a high total flow, Puohokamoa Stream was heavily utilized by plantation-era diversion ditches and was extensively monitored. Although there are currently no active gauging stations on Puohokamoa Stream, the catchment has in the past been gauged at the following six points:

a) USGS gauge 16542000, lying at 2800 ft elevation on the easternmost tributary of Puohokamoa Stream above the Wailoa Ditch diversion point, with coordinates 20°49'24"N 156°12'13"W. This gauge had a 7-year period of record (based on complete water years) from 1920-1927, with a mean discharge of 1.9 cfs, and a calculated TFQ_{50} (the total flow that is equaled or exceeded 50 percent of the time) of 0.77 cfs (CWRM 2009a).

b) USGS gauge 16543000, lying at 2900 ft elevation on the main branch of Puohokamoa Stream above the Wailoa Ditch diversion point, with coordinates 20°49'28"N 156°12'41"W. This gauge had a 14-year period of record (based on complete water years) from 1920-1933, with a mean discharge of 3.8 cfs, and calculated a TFQ_{50} of 1.3 cfs (CWRM 2009a).

c) USGS gauge 16544000, lying at 2800 ft elevation on the main branch of Puohokamoa Stream above the Wailoa Ditch diversion point, with coordinates 20°49'44"N 156°12'50"W. This gauge had a 10-year period of record (based on complete water years) from 1919-1928, with a mean discharge of 5.5 cfs, and calculated a TFQ_{50} of 1.7 cfs (CWRM 2009a).

d) USGS gauge 16545000, lying at 1322 ft elevation on the main channel of Puohokamoa Stream, with coordinates 20°51'09"N 156°11'19"W. This gauge had 58-year period of record, from 1914-1971 (based on complete water years). Within this period of record, total flow varied widely, from a high of 1000 cfs to a low of 0.6 cfs. The hydrograph provided here, spanning the years 1955-1957, is indicative of these patterns, showing that stream discharge contracts significantly during the summer months, but that the stream never goes completely dry at the Hana Highway bridge. Using the data from USGS gauge 16545000, Puohokamoa Stream in the reach near the bridge during the time the diversions were operational had a mean discharge of 33 cfs and calculated a TFQ_{50} of 13 cfs. (CWRM 2009a).

e) USGS gauge 16546000, lying at 1300 ft elevation above the Hana Highway, between the Wailoa and Spreckles ditch points of diversion. No flow statistics are available for this gauge.

f) USGS gauge 16547000, lying at 1250 ft elevation above the Hana Highway, downstream from the Wailoa Ditch point of diversion. No flow statistics are available for this gauge.

A previous survey of this stream in the vicinity of the Hana Highway bridge was conducted on 11 December 2008 by staff from Hawaii DAR and the Bishop Museum (Higashi *et al*. 2009)). This survey occurred during a year when the Hawaii Commercial and Sugar Company (HC&S) plantation was still active, and the East Maui Irrigation Company (EMI) ditch system was diverting a significant amount of water. As such, this report noted that: “The majority of stream habitat appeared to be lost in Puohokamoa Stream due to minimal flow. Pools with little or no flow were the only habitat available.” In addition, the DAR survey was conducted during rainy conditions, which were not suitable for objective evaluation of the presence or absence of native damselfly species. Only a single species of native goby, *Lentipes concolor*, was detected.

During the present survey, Puohokamoa Stream was visited on 25 April 2022 from 12:30-2:00 PM, in initially rainy weather than then cleared to filtered sunlight, and then to full sun. Faunal observations were made in the vicinity of the Hana Highway bridge, and for approximately 200 ft upstream and 1000 ft downstream (Figs. 15-18). The area immediately beneath the bridge consisted of rapids and flowing pools up to 3 ft deep, amid large, jagged boulders, rocks, cobbles and gravel. The stream reach above the bridge consisted of additional rapids and pools, leading to a large, deep, circular, cliff-bound plunge pool below a waterfall over bedrock about 50 ft high. The stream reach below the bridge was open and unshaded, with the stream flowing through rapids amid numerous large boulders before passing over a waterfall about 100 ft high. The water temperature in flowing sections was 21° C. The stream flow was flowing at a moderately high volume, and the water was clear, indicating that this was not due to flooding

from upslope rains, but instead from limited diversion from upstream ditches. An immature native damselfly *Megalagrion hawaiiense* was taken from a wet bedrock face adjacent the waterfall upstream of the bridge. A full list of aquatic species observed here can be found in Table 1.

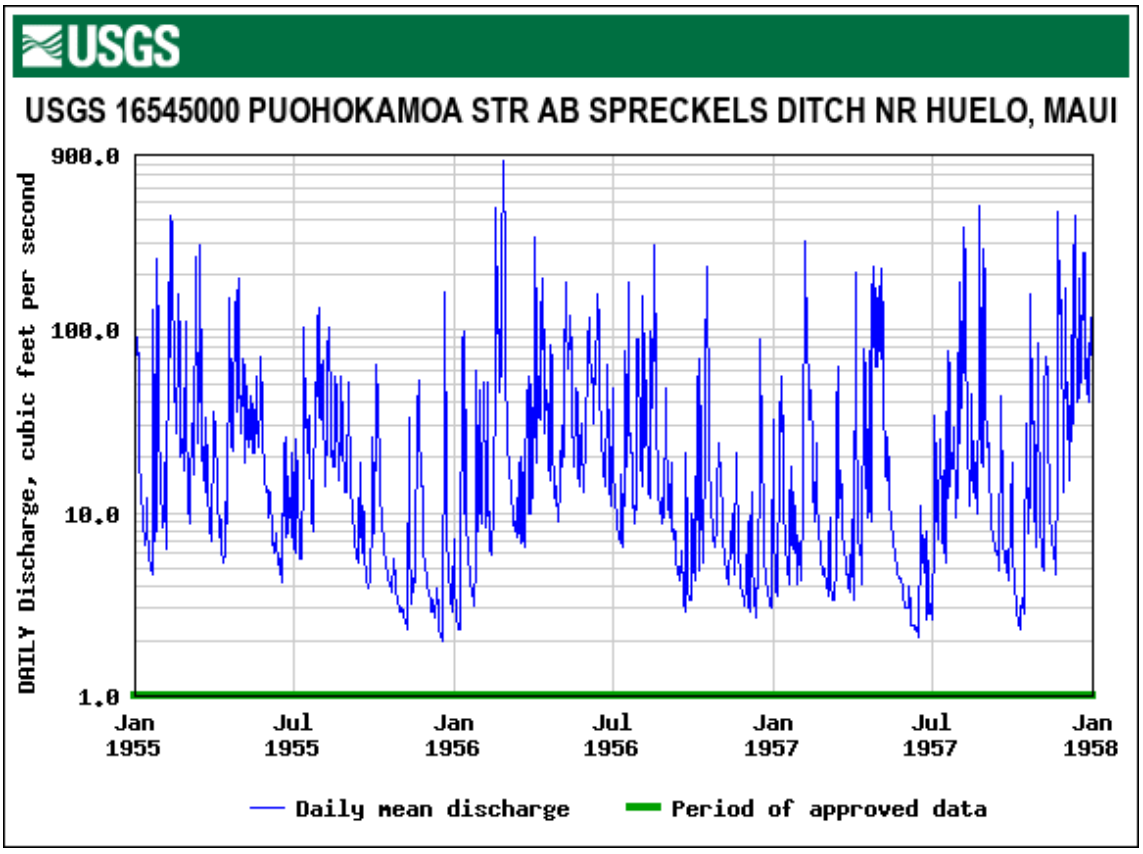


Fig. **3**. Exemplar hydrograph for Puohokamoa Stream spanning the years 1955-1957, and showing the wide variations in discharge rate, and the generally lower pattern of discharge during the drier summer months from May through August (from online data provided by the USGS Water Resources Division).

This minimal amount of flow observed by the DAR survey team in year 2008, as noted above, stands in great contrast to what was observed during the current survey (Figs. 15-18), where the stream was flowing strongly and clearly exceeded the TFQ_{50} of 13 cfs. This indicates that significant changes have occurred in regard to stream discharge following the closure of the HC&S plantation and the consequent reduction of diversions by ditches upstream of the Hana Highway, but since gauging on Kailua Stream was discontinued in 1971, no quantitative record of such changes is available.

Kopiliula Stream Catchment

The location of Kopiliula Stream, and of the other two more easterly bridges, are shown in Fig. 4 below.

Kopiliula Stream has its headwaters near 8000 ft elevation on the north Kalapawili Ridge, which rims Haleakala Crater. The headwater reaches contain three major branches, which run roughly

parallel before consolidating near 2400 ft. A major east bank tributary, the Puakaa, also enters just above the stream mouth. The Kopiliula Stream system gains groundwater flow from 3100 ft down to 1300 ft, then formerly lost flow between 1300 and 500 ft due to ditch diversions, before reverting to a gaining system from 500 ft down to sea level (Gingerich, 1999). With the closure of the sugar plantation subsequent to that study, and the resultant

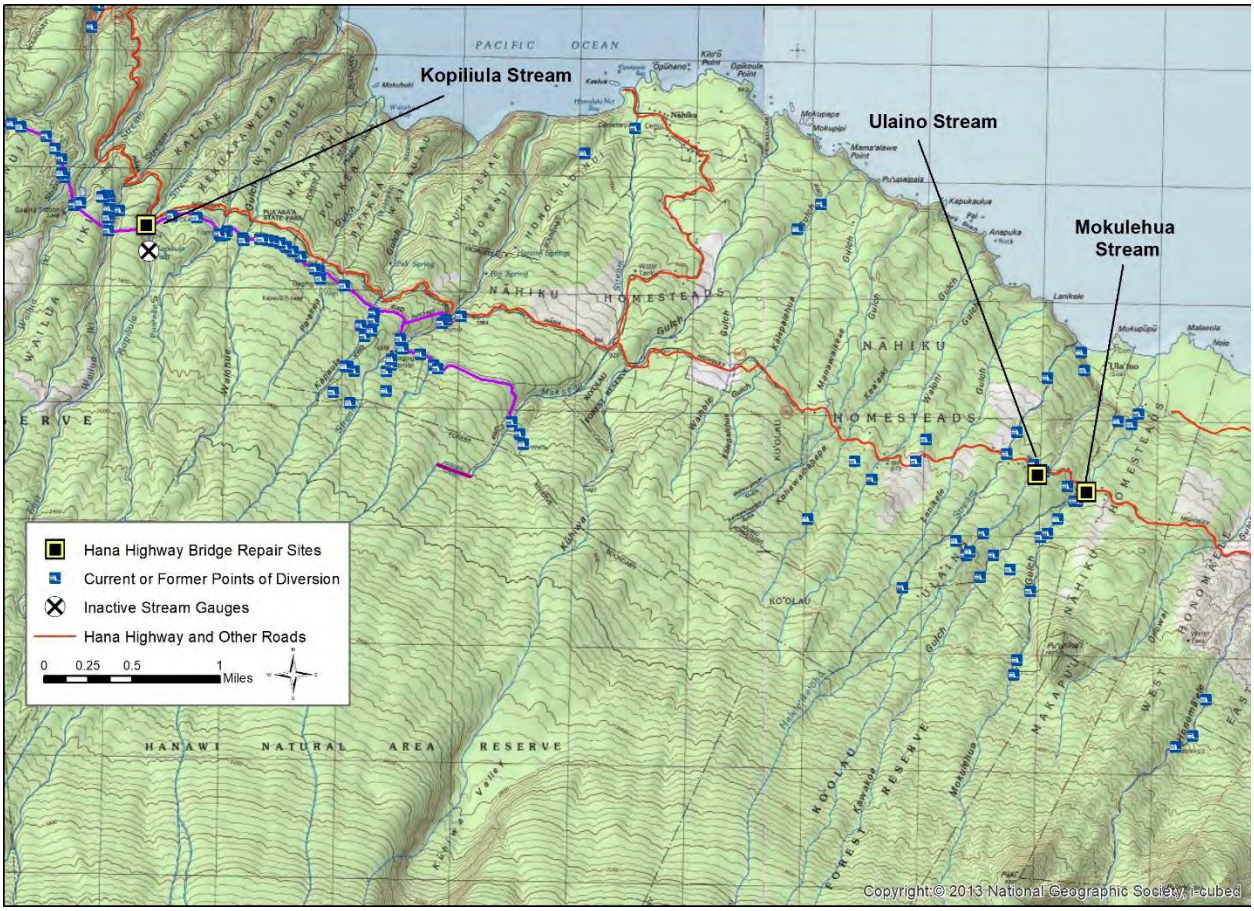


Fig. **4**. Map of the western sector of the windward coast on Haleakala, Maui showing the locations of bridges proposed for repair at Kopiliula, Ulaino, and Mokulehua streams. The Hana Highway is shown in red; ditch system alignments are shown in purple; current and former points of diversion are indicated by small blue-and-white squares; and former gauging stations are indicated by white circles with crosses.

reduction in diversion volume, it is possible that the Kopiliula is currently a gaining system throughout its length. The hydrologic character of the stream in its headwater reaches above 3100 ft has not been studied.

As is typical of streams east of the Koolau Gap, there is only a single point of diversion on Kopiliula Stream, represented by Intake K-15 on the Koolau Ditch. The control structures for this intake are integrated into the Hana Highway bridge (Figs. 19, 20), with the stream channel forming a portion of the ditch conveyance. The ditch waters enter the stream from a short tunnel on the east side (Fig. 22), are captured behind a weir that forms part of the bridge structure, and then exit to the west through another tunnel behind a control house (Fig. 20). The stream reach containing the bridge and weir is bounded by a high waterfall not far upstream, while

downstream of the bridge the stream enters a deeply incised bedrock gorge with three high waterfalls in close succession, separated by deep plunge pools and bedrock rapids. Given these topographical constraints, biological survey work was conducted only in the upstream direction. A set of springs also enters from the west wall of the stream valley not far upstream of the highway crossing, providing additional aquatic habitat.

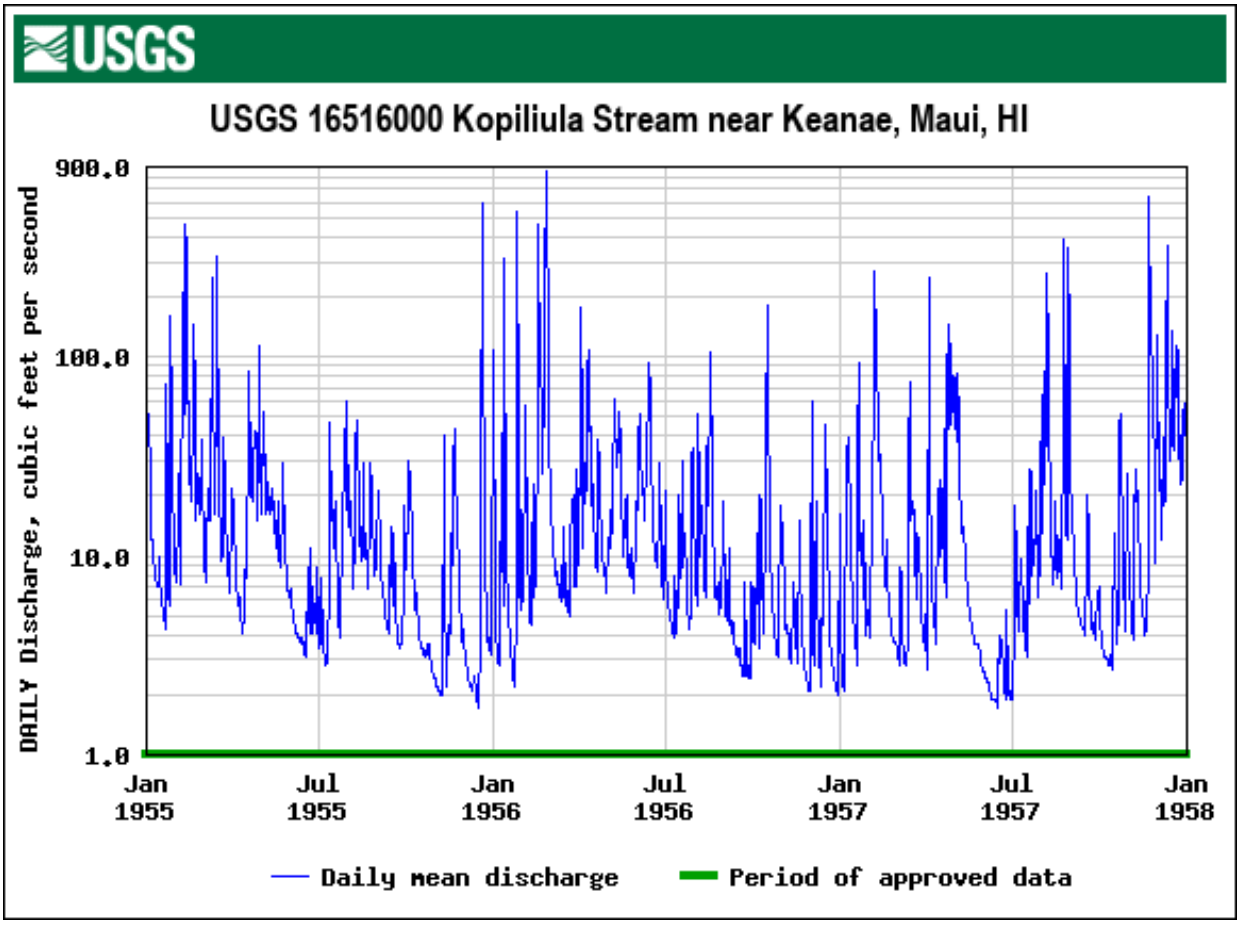


Fig. **5**. Exemplar hydrograph for Kopiliula Stream spanning the years 1955-1957, and showing the wide variations in discharge rate, and the generally lower pattern of discharge during the drier summer months from May through August (from online data provided by the USGS Water Resources Division).

There are no active rainfall gauges in the vicinity of Kopiliula Stream. Estimated rainfall at the Hana Highway bridge, based on the online Rainfall Atlas of Hawaii, is 225 inches per year, with higher elevations in the catchment receiving up to 248 inches per year.

There are no current gauging stations on Kopiliula Stream, although this catchment has in the past been gauged at the following point:

USGS gauge 16516000, lying at 1290 ft elevation, with coordinates 20°48'53"N 156°08'02"W. This gauge had a 44-year period of record, from 1914-1957. Within this period of record, total flow varied widely, from a high of 1500 cfs to a low of 1.0 cfs. The hydrograph provided here, spanning the years 1955-1957, is indicative of these patterns, showing that stream discharge contracts significantly during the summer months, but that the stream

> never goes completely dry at the Hana Highway bridge. Using the data from USGS gauge 16516000, Kopiliula Stream in the reach near the bridge during the time the diversions were operational had a mean discharge of 28 cfs, and calculated a TFQ_{50} of 9 cfs. (CWRM 2009b).

During the present survey, Kopiliula Stream was visited on 26 April 2022 from 12:50-2:00 PM, in partly cloudy weather gradually deteriorating to rain. Faunal observations were made in the vicinity of the Hana Highway bridge, and for approximately 500 ft upstream (Figs. 19-24); no observations were made downstream of the bridge due to steep topography and high waterfalls which rendered access hazardous (Fig. 25). The area immediately beneath the bridge consisted of the downstream face of the diversion weir, set on an exposure of bedrock. The stream reach above the bridge consisted of a large, deep pool behind the diversion weir, divided on its upstream side by a bedrock promontory. Further upstream of this point the stream could be followed through a set of rocky rapids until reaching a moderately large plunge pool in bedrock, lying below a waterfall about 50 ft high. The stream reach below the bridge flowed in rapids over bedrock sills before passing over a waterfall about 50 ft high with a large, deep plunge pool below. The water temperature in flowing sections was 21° C. The stream flow was flowing at a moderately high volume, having been increased by minor flooding from upslope rains, so that the water was slightly cloudy and turbid. The recently emerged adults of the native damselfly *Megalagrion hawaiiense* (Fig. 26) were observed in the vicinity of spring outflows coming off the west wall of the gulch in the area upstream of the pool impounded by the diversion. A full list of aquatic species observed here can be found in Table 1.

Ulaino Stream Catchment

The headwaters of Ulaino Stream lie near 5000 ft elevation in a boggy area along the Haleakala east rift zone, which receives very high rainfall. The stream channel morphology of the upper Ulaino catchment is complex because the area is underlain by recent Hana series basalts of Pleistocene age, on which the drainage networks are still very recent. In particular, the upper midreach channels of Ulaino Stream upslope of the Hana Highway are reticulate, and interbraided with those of Heleleikeoha Stream, occupying the catchment immediately to the east (Fig. 6). As such, these two catchments are not hydrologically discrete, and likely share aquatic biota.

In addition, the headwaters of Ulaino Stream lie in one of the wettest areas on earth. Although there are no active rainfall gauges in the vicinity of Ulaino Stream itself, estimated rainfall at the Hana Highway bridge, based on the online Rainfall Atlas of Hawaii, is 161 inches per year, with higher elevations in the catchment receiving up to 394 inches per year.

The Hana basalt surface that prevails on the northern slope of Haleakala to the east of Nahiku significantly influences stream channel morphology and hydrology. As noted by CWRM (2009b), these young basalts are highly permeable and lack interstratfied beds of clay or other impermeable material, which allows most rainfall to percolate directly through to the base of the formation (Stearns and MacDonald, 1942). Consequently, the headwaters and midreaches of systems such as the Ulaino are intermittent rather than perennial, flowing at irregular intervals in a confusing network of interconnected channels that convey the high local rainfall down the

slopes. These channels dry out quickly following rains, leaving only remnant pools amid the bedrock, some of these probably fed by residual seepage. At lower altitudes near the coast, where the percolating waters finally emerge, some of these intermittent channels may become perennial, as the ground water discharges into these streams as base flow (Takasaki & Yamanaga, 1970), and large amounts of such groundwater are believed to flow seaward as undersea discharges at the base of the Hana volcanics (Stearns & MacDonald, 1942).

Fig. **6**. Oblique satellite image of the Ulaino Stream catchment, looking southeast, with the major drainage channels emphasized in blue. The intertwined nature of this catchment with that of adjacent Heleleikeoha Stream, immediately to the west, is evident, and is typical of the complex and reticulating drainage networks formed on the Pleistocene Hana series basalts along the windward flank of Haleakala from Hanawi Stream eastward to Hana. The higher elevations in this area see very high annual rainfall, approaching 400 inches per year.

Although records from the State of Hawaii, Commission on Water Resource Management indicate the presence of four diversion on Ulaino Stream, it is not clear that any of these are currently active. All are apparently small, localized diversions, mostly in the form of pipes, and associated with cattle ranching activities; none are integrated into larger ditch systems.

Ulaino Stream has never been gauged, and no hydrograph is available for this site. In drier months the channel lacks surface flow, with only scattered pools present in a bed of Hana series basalt bedrock (Figs. 27, 28). This channel morphology and hydrology appears to have inhibited the upstream migration of invasive aquatic species in this catchment.

During the present survey, Ulaino Stream was visited on 26 April 2022 from 11:15 AM-12:30 PM, in sunny to partly cloudy weather. Faunal observations were made in the vicinity of the

Hana Highway bridge, and for approximately 500 ft upstream and 100 ft downstream (Figs. 27-34). The area immediately beneath the bridge, as well as the reaches upstream and downstream, consisted of unshaded and irregular exposures of Hana basalt bedrock with scattered pools, some connected by very shallow, seeping flows. Approximately 200 ft upstream of the bridge a set of pools is shaded by several large riparian trees, and in this area (Fig. 34) individuals of the ESA-listed damselfly species *Megalgrion pacificum* were observed. The water temperature in these shaded pools was 24° C, and thus notably cooler than in the unshaded pools in the nearby bedrock, which had water temperatures of 27° C. A full list of aquatic species observed here can be found in Table 1.

Mokulehua Stream Catchment

The headwaters of Mokulehua Stream lie near 5000 ft elevation in a very rainy and boggy area along the Haleakala east rift zone. Above the Hana Highway this catchment has two branches of nearly equal length, the Kawakoa to the west, and Mokulehua to the east, which join 0.12 miles upstream of the Hana Highway bridge. The area lying further upslope, between these two branches, has numerous reticulating channels similar to those seen in the upper Ulaino-Heleleikeoha system.

Similar to adjacent Ulaino Stream, the headwaters Mokulehua Stream lie in one of the wettest areas on earth. Although there are no active rainfall gauges in the vicinity of the Mokulehua Stream bridge, estimated rainfall at the Hana Highway, based on the online Rainfall Atlas of Hawaii (Giambelluca *et al*., 2013), is 165 inches per year. The Big Bog rain gauge, located near the stream's headwaters, has a 29-year period of record from 1993 to present, and an astounding mean annual rainfall reading of 404 inches per year.

Although records from the State of Hawaii indicate the presence of 10 diversions on Ulaino Stream, it is not clear that any of these are currently active. All are apparently small, localized diversions, most in the form of pipes associated with cattle ranching activities, and none are integrated into larger ditch systems.

Mokulehua Stream has never been gauged, and no hydrograph is available for this site. The channel can run completely dry during certain summer months, since the catchment is underlain by young Hana series basalts with poor water retention. At the time of our survey in April 2022, rains upslope had created a strong flow in the channel, but in some cases the waters were emerging from lava tubes at the bases of waterfalls, rather than passing over the lips of the falls themselves (Fig. 38), further illustrating the complex channel morphology of this stream.

During the present survey, Mokulehua Stream was visited on 26 April 2022 from 10:30-11:10 AM, in sunny to partly cloudy weather. Faunal observations were made in the vicinity of the Hana Highway bridge, and for approximately 500 ft upstream and 100 ft downstream (Figs. 35-38). The area immediately beneath the bridge consisted of a deep, flowing pool bordered by basalt cliffs and the concrete bridge abutments. The reach downstream of the bridge consisted of partly shaded exposures of Hana basalt bedrock, with the stream flowing in deep pools until reaching the lip of a waterfall about 50 ft high. The reach upstream of the bridge was a large, deep plunge pool with a vertical bedrock sill on its upstream side. On the day of the survey,

turbid flood waters were emerging from a lava tube at the base of this sill, rather than cascading over it, illustrating the complex channel morphology of this stream created by the Hana basalts. Although overnight rains upslope had caused to stream to flood to some degree on the day of the survey, aerial photographs from other times of year indicate that the channel is often dry in the area near the bridge. The water temperature in the flowing sections of the channel was 21° C. A full list of aquatic species observed here can be found in Table 1.

FISH AND WILDLIFE RESOURCE CONCERNS AND PLANNING OBJECTIVES

The Service's primary concerns with the proposed project are to determine any potential impacts to species formally listed as Threatened or Endangered under the ESA, as well as any other fish and wildlife trust resources and their habitats, from planned modifications to stream channels and adjacent riparian habitats. Specific Service planning objectives are to maintain and enhance any existing significant habitat values at the proposed project site by (1) obtaining basic biological data for the proposed project site, (2) evaluating and analyzing the impacts of proposed-project alternatives on fish and wildlife resources and their habitats, (3) identifying the proposed-project alternatives least damaging to fish and wildlife resources, and (4) recommending mitigation for unavoidable project-related habitat losses consistent with the FWCA and the Service's Mitigation Policy.

Under the authority of the ESA, the Department of the Interior and the Department of Commerce share responsibility for the conservation, protection, and recovery of federally listed endangered and threatened species. Authority to conduct consultations has been delegated by the Secretary of the Interior to the Director of the Service and by the Secretary of Commerce to the Assistant Administrator for Fisheries of the National Oceanic Atmospheric Administration (NOAA). Section 7(a)(2) of the ESA requires federal agencies, in consultation with and with the assistance of the Service or NMFS, to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitats. The Biological Opinion is the document that states the opinion of the Service or NMFS as to whether the federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The Biological Opinion is also a document separate from the current Planning Aid Report, prepared under the authority of FWCA.

The Service's 19881 Mitigation Policy outlines internal guidance for evaluating project impacts affecting fish and wildlife resources. The Mitigation Policy complements the Service's participation under NEPA and the FWCA. The Service's Mitigation Policy was formulated with the intent of protecting and conserving the most important fish and wildlife resources while facilitating balanced development of the nation's natural resources. The policy focuses primarily on habitat values and identifies four resource categories and mitigation guidelines. The resource categories are the following:

a) Resource Category 1: Habitat to be impacted is of high value for the evaluation species and is

unique and irreplaceable on a national basis or in the ecoregion section.

b) Resource Category 2: Habitat to be impacted is of high value for the evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.

c) Resource Category 3: Habitat to be impacted is of high to medium value for the evaluation species and is relatively abundant on a national basis.

d) Resource Category 4: Habitat to be impacted is of medium to low value for the evaluation species.

Given the presence of perennial base flow along all the streams surveyed; the presence of extensive riffle and pool habitat; and the documented presence of an ESA-listed native damselfly species at one of the six sites, the habitat to be impacted by the proposed project is considered to represent Category 1.

EVALUATION METHODOLOGY

Existing Faunal Records

The Hawaii DAR, in partnership with the Bishop Museum, has conducted previous faunal surveys using standardized point quadrat methods in two of the streams covered by the current report: Puohokamoa and Kopiliula. The other four streams treated by this report have not been subject to previous Hawaii DAR surveys, but existing data in regard to previous faunal records was compiled in the Maui volume of the DAR Atlas of Hawaiian Watersheds (Parham et al. 2008). Subsequent detailed surveys, concentrating primarily on diadromous macrofauna, were undertaken by DAR along Puohokamoa and Kopiliula streams in support of development of instream flow standards by CWRM (Higashi et al. 2009a, 2009b). Previous faunal records from these surveys are incorporated into Table 1 below.

New Survey Work

The six streams described in the preceding sections were surveyed on 25 and 26 April 2022 by a combined team of six field biologists from the U. S. Fish and Wildlife Service, the State of Hawaii DLNR Division of Forestry and Wildlife, and Bishop Museum, so that each hour spent at a survey site equated to six man-hours of observations. The purpose of these surveys was to augment the previous faunal information with more detailed observations and collections of native aquatic invertebrate species, including aquatic insects and snails, with a particular emphasis on the presence or absence of native *Megalagrion* damselfly species listed under the Endangered Species Act. These additional faunal observations are also included in Table 1 below.

DESCRIPTION OF FISH AND WILDLIFE RESOURCES

Based on the studies and surveys described above, the native and introduced aquatic species recorded from the proposed project area are summarized in Table 1 below. The native species

listed, which are trust resources of concern to the Service, are either resident within or periodically transit the stream reaches that would be impacted by the proposed bridge repair activities. The number of aquatic species present, and of native versus introduced aquatic species, varies greatly across the six proposed project sites, but at four out of the six streams (Puohokamoa, Kopiliula, Ulaino and Mokulehua) the number of native species exceeds the number of introductions. The two biologically richest streams are Puohokamoa and Kopiliula, which are also the two streams with the highest base flows.

Table 1 – Records of aquatic biota from the six streams under study

Note: Itinerant estuarine species are not included in this table.

Species codes: E = native species endemic to the Hawaiian Islands, N = native indigenous species, I = introduced species not native to the Hawaiian Islands

Catchment codes: KAI = Kailua, MAK = Makanali, PUO = Puohokamoa, KOP = Kopiliula, ULA = Ulaino, MOK = Molulehua

Taxon	Type	KAI	MAK	PUO	KOP	ULA	MOK
AQUATIC INSECTS							
Anax junius	N	-	-	X	X	-	-
Anax strenuus	E	-	X	-	-	X	-
Pantala flavescens	N	X	-	X	-	X	X
Megalagrion blackburni	E	-	-	-	X	-	-
Megalagrion calliphya	E	-	-	-	X	-	-
Megalagrion hawaiiense	E	X	X	X	X	-	-
Megalagrion nigrohamatum	E	X	-	-	X	-	-
Megalagrion pacificum	E	-	-	-	-	X	-
Ischnura posita	I	X	X	X	X	-	-
Aedes albopictus	I	X	X	-	X	X	X
Telmatogeton sp.	E	-	-	X	X	-	-
Microvelia vagans	E	X	X	-	X	X	X
Saldula exulans	E	-	-	X	-	-	-
Cheumatopsyhe analis	I	-	-	-	X	-	-

Table 1 (cont.)

Taxon		KAI	MAK	PUO	KOP	ULA	MOK
SPONGES							
Heteromeyenia baileyi	N	-	-	-	X	-	-
SNAILS							
Neritina granosa	E	-	-	-	X	-	-
Physidae undet.	I	-	-	-	X	-	-
PRAWNS							
Atyoida bisulcata	E	-	-	X	X	-	-
Macrobrachium lar	I	X	X	X	-	-	-
FISHES							
Awaous guamensis	N	-	-	X	X	-	-
Eleotris sandwicensis	E	-	-	-	X	-	-
Lentipes concolor	E	-	-	X	X	-	-
Sicyopterus stimpsoni	E	-	-	-	X	-	-
Tilapia sp.	I	X	-	-	-	-	-
Poecilidae undet.	I	-	X	-	X	-	-
AMPHIBIANS							
Rana rugosa	I	-	-	-	X	-	-

	KAI	MAK	PUO	KOP	ULA	MOK
Native Species present	4	3	8	14	4	2
ESA-listed species present	0	0	0	0	1	0
Invasive species present	4	4	2	6	1	1
Total species present	8	7	10	20	5	3
DAR Biological Ranking	3	NR	5	8	NR	NR

NR = not rated by DAR

The native aquatic species listed in Table 1 are discussed in greater detail below. In order to utilize the data contained in the DAR *Atlas of Hawaiian Watersheds,* the following conventions were necessary in regard to catchment delineations:

1) In the DAR atlas, Makanali is included in the Oopuola Stream watershed treatment, because it is a tributary to that system. It was not given a biological rating independent of the Oopuola system as a whole and is therefore treated as Not Rated, or NR, in the table below.

2) In the DAR atlas, Ulaino and Mokulehua streams are grouped together with Heleleikeoha Stream as a common watershed unit, due to their intertwined midreach channels. The DAR atlas does not record any previous biological survey data for these catchments thus they were assigned no biological rating in the atlas, and are treated as NR in the table below.

Fishes

The following native fish species have been recorded from the six streams in the project area by previous DAR surveys and referenced below. All of these species are amphidromous, with the larvae developing in marine habitats, then recruiting to streams where they mature into adults in freshwater. The species tend to stratify ecologically with elevation, and not all these species have been recorded from every stream in the project area. Because the DAR surveys were undertaken while ditch diversions were still active, they reflect conditions of lower habitat availability than currently prevail. As a result, some of these species may now have extended their ranges further upstream than was recorded by DAR in 2009.

Family Gobiidae

Awaous guamensis – Pacific river goby – This is an insular Pacific species, occurring from Guam southward and eastward to New Caledonia, Vanuatu, Fiji, Samoa, and Hawaii. Recent molecular studies suggest that cryptic species may be present across this range. Adults are omnivorous and may burrow into soft substrates with only the eyes visible, and the species may attain a moderate size, being sometimes harvested for human consumption in Hawaii. Although this is most typically a species of terminal and lower midreach habitats, it may range upstream for some distance in streams with sufficient flow. At Kopiliula Stream the DAR surveys noted one individual was seen in the reach below the Hana Highway (Higashi et al. 2009b), and another DAR report notes this species as ranging upstream to 600 ft elevation in Puohokamoa Stream (Higashi et al. 2009a), so the species may plausibly occur in the project area.

Eleotris sandwicensis – Hawaiian sleeper – This species is endemic to Hawaii, inhabiting stream terminal reaches and estuaries, where it preys on a wide range of aquatic organisms. It was found on the DAR surveys only in the terminal reach of Kopiliula Stream (Higashi et al. 2009b), and because of its ecological restriction to lower elevations, it is not present at any of the Hana Highway bridge sites sampled. As such, the only potential project impacts to the species would be from sediments sent downstream during construction.

Sicyopteris stimpsoni – Stimpson's goby – This is a climbing goby species endemic to Hawaii that occurs in the midreach and headwater reach sections of high gradient streams, where it feeds on algae and diatoms. In the project area, this species was recorded by the DAR surveys only in the lower and middle reaches of Kopiliula Stream (Higashi et al. 2009b) and did not reach the elevation of the Hana Highway bridge and integrated diversion. As with *Eleotris sandwicensis* previously discussed, the only potential project impacts to the species would be from sediments sent downstream during construction.

Lentipes concolor – Hawaiian stream goby – This endemic Hawaiian climbing goby has the highest elevational range of any native Hawaiian freshwater fish, being able to surmount waterfalls up to 1000 ft high, and inhabit upper elevation perennial stream reaches in excess 3500 ft. At Kopiliula Stream this species was observed by DAR survey crews as high as the Hana Highway bridge and integrated diversion structure but was not seen upstream of the highway (Higashi et al. 2009b), although under current restored flow conditions it may have been able to surmount this barrier. At Puohokamoa Stream adult females were observed in the plunge pool below the waterfall just upstream of the Hana Highway bridge (Higashi et al. 2009a), so the species definitely occurs in the project area at this bridge site. Although survey data is lacking, *L. concolor* is also likely to occur within the project area at Makanali, given the presence of excellent habitat there. In Kailua stream its upstream migration is blocked by several legacy diversion structures and a reservoir, and at Ulaino and Mokulehua streams the absence of perennial flowing habitats precludes its establishment and persistence.

Decapods

The following native prawn has been recorded from the proposed project area.

Family Atyiidae

Atyoida bisulcata – This endemic, amphidromous Hawaiian freshwater shrimp is found throughout the main Hawaiian Islands in clean, rocky, high gradient streams with limited suites of invasive species, and can surmount high waterfalls to access headwater reaches in excess of 4000 ft. There is anecdotal evidence to suggest that it may be preyed upon or competitively displaced by the larger invasive Tahitian prawn, Macrobrachium lar. Within the project area, A. bisulcata was recorded by DAR surveys both upstream and downstream of the Hana Highway at Puohokamoa and Kopiliula streams (Higashi et al. 2009a, 2009b).

Molluscs

A single species of native mollusc has been recorded from the proposed project area:

Family Neritidae

Neritina granosa – This endemic, amphidromous Hawaiian freshwater nerite is found throughout the main Hawaiian Islands in swift, rocky streams with beds of rocks and gravel, generally in lower midreaches. In the project area its has been observed only in the midreach

of Kopiliula Stream below the Hana Highway at (Higashi et al. 2009b). As such, the only potential project impacts to the species would be from sediments sent downstream during construction.

Aquatic Insects

The following species of native aquatic insects have been recorded from the project area, based primarily on recent surveys conducted in April 2022:

Order Odonata

Anax junius – This very large dragonfly, endemic to Hawaii, was observed patrolling along the stream corridor at Makanali and Ulaino streams but has the potential to be present at the other four bridge sites as well, particularly Puohokamoa or Kopiliula. The adults are strong fliers which range widely up and down the length of a stream reach, while the immatures generally inhabit pools.

Anax strenuus – This is a highly migratory species, widespread in North America, whose status as a potential indigenous element in the Hawaiian insect biota is still a matter of debate; it is treated here as an indigenous species. It resembles *A. strenuus* discussed above, but is slightly smaller in size, more greenish in overall coloration, and usually occurs at slightly lower elevations. In the project area it was seen flying along the stream corridor at Puohokamoa and Kopiliula streams, but its presence is also plausible at Kailua, Ulaino and Mokulehua streams as well.

Pantala flavescens – This pantropical species is the most widely distributed dragonfly in the world and has colonized many remote oceanic islands. It breeds in standing waters, and the immatures can tolerate a certain degree of mild salinity. It was seen at four of the six bridge project sites (see Table 1) and is likely to occur at the other two as well.

Megalagrion blackburni – This striking, bright red species is one of the largest of the native Hawaiian damselflies and has immature stages that breed in swift running waters or on wet bedrock faces adjacent to waterfalls. The species occurs on Maui, Molokai, Lanai and Hawaii islands. Although *M. blackburni* has been previously reported from Kopiliula Stream upstream from the Hana Highway bridge, it was not seen in the proposed bridge repair area during the present survey. Suitable habitats for *M. blackburni* were also present in the general vicinity of the highway bridges at Kailua, Makanali, and Puohokamoa streams, and although it was not seen at these additional sites, it's potential presence there is plausible, given that the adults are strong fliers that range widely along stream corridors and sometimes up onto adjacent ridges.

Megalagrion calliphya – This small, delicate, red species of endemic Hawaiian damselfly occurs on Maui, Molokai, Lanai and Hawaii islands, breeding in still pools adjacent to streams or along headwater streamlets. It has been previously reported from Kopiliula Stream just upstream of the Hana Highway bridge but was not seen during the present surveys. This

is generally a species of higher elevations near 4000 ft, and the Kopiliula record is near the lower end of its altitudinal distribution zone.

Megalagrion hawaiiense – This is a common and widespread native damselfly which breeds in seeps and in springs on Oahu, Molokai, Lanai, Maui and Hawaii islands. It was encountered during the current survey in the vicinity of the Hana Highway bridges at Makanali, Puohokamoa and Kopiliula streams, and has previously been recorded on Kailua Stream at the EMI ditch road upstream of the Hana Highway. It has never been recorded from the Ulaino or Mokulehua catchments and was not seen there during the current survey.

Megalagrion nigrohamatum – This is a moderate-sized endemic Hawaiian damselfly, the adults of which display striking yellow-and-black coloration and fly along the unshaded margins of rocky upland streams. The species presently occurs only on Maui and Molokai, having been extirpated long ago on Lanai. This species has been previously reported from Kailua and Kopiliula streams at elevations upstream of the Hana Highway but was not observed in the vicinity of any of the six bridges within the proposed project footprint during the current survey.

Megalagrion pacificum – See discussion under ESA-listed species.

Order Diptera

Telmatogeton sp. – Members of the genus *Telmatogeton* are large grey midges which swarm on rocks in cascade zones in clean, rocky upland streams, on in wave-splashed areas on rocky seacoasts, and have undergone a local radiation of five endemic freshwater species in Hawaii. An undetermined species was previously noted to occur at both Puohokamoa and Kopiliula streams (Higashi et al. 2009a, 2009b), but this genus was not observed in the vicinity of the Hana Highway bridges during the current survey.

Order Heteroptera

Microvelia vagans – This is a small, surface-skating bug endemic to the Hawaiian Islands that is commonly encountered on pools bordering both perennial and intermittent stream channels. It was present at all six of the bridge sites surveyed. A preliminary morphological analysis indicates that the name *M. vagans* has been applied to a complex of related species, with "true" *M. vagans* confined to Oahu, and the Maui populations representing a separate, currently undescribed species.

Saldula exulans – This endemic Hawaiian shore bug is locally common along rocky upland streams, where it inhabits damp rocks and gravel bars along the stream margins. An adult was observed during the current surveys in the area immediately downstream of the Hana Highway bridge at Puohokamoa Stream.

The preceding analysis indicates that the six streams in the project area support varying combinations of native aquatic species, and that many of these are endemic to the Hawaiian Islands.

ESA-listed Species

Megalagrion pacificum – A population of this rare native damselfly, listed as Endangered under the ESA, was observed in a set of seepage-fed side pools in bedrock approximately 150 ft upstream of the Ulaino Stream bridge on the Hana Highway. The population appeared to be relatively small, with only three individuals observed here and at several other pools further upstream over the course of an hour spent at the site. The stream along this reach consisted of scattered pools in Hana basalts, fed by low volume, laminar flows or perhaps by seepage through the porous lavas, and was devoid of introduced fishes, the presence of which is negatively correlated with the persistence of *Megalagrion* populations (Englund, 1999).

To determine whether streams of this type might be generally amenable to the persistence of *M. pacificum*, quick reconnaissance surveys were made along several nearby streams with similar bed morphology and hydrological characteristics. This revealed a second previously unknown population of *M. pacificum* upstream of the Hana Highway bridge at Kawaihapapa Stream, one mile to the west of Ulaino. This stream also occupied a channel composed of Hana basalt bedrock, containing scattered pools devoid of introduced fishes. These results indicate that *M. pacificum* may be more prevalent in the streams east of Nahiku than was previously realized, and that more intensive surveys during good weather along all the stream channels from Kuhiwa Stream eastward to Honomaele Stream are warranted in order to understand its local distribution in this area. At a minimum, a more intensive longitudinal survey of the Ulaino Stream channel should be undertaken to determine if this species occurs downstream from the proposed construction site, where it could be impacted by sediment generated by bridge repair activities.

Non-native Species

In addition to the above native taxa, eight introduced aquatic species are recorded from the project area. These include mosquitofishes (family Poeciliidae), tilapia (family Cichlidae), the Japanese wrinkled frog (*Rana rugosa*), the Tahitian prawn (*Macrobrachium lar*), one species of physid snail, and several aquatic insects, including the mosquito *Aedes albopictus*. They are not treated in detail because the Service considers them pests, and therefore impacts to their populations from the proposed project are discountable.

DESCRIPTION OF ALTERNATIVES EVALUATED

To date, no specific construction plans have been provided to the Service for any of the six bridge sites under study. Instead, the following general alternatives were provided in correspondence from FHA to the Service dated 11 February 2019:

Alternative A: No Action

Under the No Action alternative, no changes would result to the stream channels at the six bridge sites along the Hana Highway and their immediate surroundings.

Alternative B: Bridge Repair

The bridge repair alternative involves measures to ensure that the ageing bridges are more consistent with current highway safety standards, but no precise details or individual site designs have been provided. Correspondence from the Federal Highway Administration has simply noted that "The project will improve these six bridges in a context-sensitive manner so that they are safe and functional for highway users. Project goals will be defined through the environmental review process; however, the project would generally seek to improve the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards." It is assumed that some of the work will involve refurbishment or replacement of scoured abutments and support pillars, damage to which was evident at certain sites, even to an untrained eye (Fig. 16), and given the confined sites occupied by the bridges, in-channel and in-water construction could be required. In addition, the conjoined bridge and ditch diversion structure at Kopiliula Stream will create additional challenges, and almost certainly and of necessity lead to some temporary alterations to stream flow routing.

PROJECT IMPACTS

Alternative A: No Action

This alternative will result in no new additional impacts to native aquatic biota and needs no additional discussion.

Alternative B: Bridge Repairs

In the absence of any plans or designs, the analysis and recommendations provided here are based on the precautionary assumption that in-channel and in-water work will be required at all six of the bridge repair sites in the proposed project footprint. Polygon files in KML format provided by the Federal Highways consultant, HDR, also imply that channel modifications may extend some distance both up- and downstream.

Potential impacts to aquatic trust resources from bridge repair work as proposed in Alternative B include the following:

1) Loss of habitat and natural stream character due to channelization or channel armoring;
2) Creation of downstream sediment plumes that will impact native freshwater species, and potentially nearshore marine ecosystems;
3) Loss of riparian vegetation and channel shading;
4) Potential spread of aquatic invasive species.

The full extent of such potential impacts cannot be confidently assessed until more detailed project footprints, work plans, and designs are provided for each of the six bridge repair sites.

FISH AND WILDLIFE SERVICE RECOMMENDATIONS

The Service recommends that the following best management practices (BMPs) be applied to all activities pertaining to construction and maintenance activities for this project, to prevent construction impacts to riparian or marine ecosystems lying downstream.

Best Management Practices

(1) The permittee should make every effort to develop and implement a plan for conducting all anticipated work involving stream channels during the summer dry season. Work should be ceased and re-scheduled in the event of an out-of-season heavy rainfall;

(2) Avoid conducting construction or subsequent maintenance activities that will lead to mid- and long-term destabilization and exposure of bare sediment along the stream banks or in the stream bed;

(3) No debris, petroleum projects, or deleterious materials or wastes shall be allowed to fall, flow, leach, or otherwise enter any waters of the United States;

(4) All authorized activities shall be done in a manner to confine and isolate the construction activity and to control and minimize any turbidity that may result from in-water work. Silt curtains or other appropriate and effective silt containment devices approved by the USACE shall be used to minimize turbidity and shall be properly maintained throughout the entire period of any in-water work to prevent the discharge of any material to the downstream aquatic habitat. All sediment control devices installed as BMPs (i.e., fabric sandbags, silt curtains/screens, etc.) downstream or makai of the authorized work shall remain in place until the in-water work is completed and will be removed in their entirety and disposed of at an appropriate upland location once the water quality of the affected area has returned to its pre-construction condition;

(5) Return flow or runoff from upland dewatering site(s)/disposal site(s) shall be contained on land and shall not be allowed to discharge and/or re-enter any waters of the United States;

(6) No sidecasting or stockpiling of excavated materials in the aquatic environment is authorized. All excavated materials shall be placed above the ordinary high-water mark of any designated waters of the United States or disposed of in an upland location. The permittee shall demonstrate that there is no reasonable expectation that disposal locations adjacent to high tide lines on the ocean, or in floodplains adjacent to other rivers or streams, would result in the material being eroded into the nearby waterbody by high tides and/or flood events;

(7) Warning signs shall be properly deployed and maintained until the portion of the in-water work is completed and the affected area water quality has returned to its preconstruction condition and turbidity control devices have been removed from the waterway;

(8) Fueling, repair, and other activities with any potential to release pollutants will occur in a location where there is no potential for spills to have an effect on waters of the United States;

(9) When the contractor is notified that an authorized activity is detrimental to fish and wildlife resources, the USACE will issue a suspension order until all pertinent issues have been satisfactorily resolved. The permittee shall comply with any USACE-directed remedial measures deemed necessary to mitigate or eliminate the adverse effect.

Other Recommendations

In addition to the Best Management Practices noted above, if Alternative B is selected for future design and construction, then:

1) Creation of any permanent barriers to faunal passage, such as overhanging drops from which water cascades without touching the underlying substrate, or long culverts that require transit of organisms through dark passages, should be avoided.

2) Alternation of natural stream channel character through armoring or construction of concrete channels should be avoided or minimized to the best extent possible at all six sites.

3) Clearing of riparian vegetation should be minimized to the greatest extent possible.

4) When specific designs become available for each individual bridge work site, these should be provided to the Service for evaluation, so that recommendations can be provided to avoid or minimize impacts to trust resources.

5) Once a design is finalized for work at Ulaino Stream, a supplementary field survey should be undertaken at that site to more completely understand the distribution of ESA-listed *Megalagrion pacificum* populations in stream reaches both above and below the bridge.

The Service and the Hawaii DLNR are available to work with the Department of Transportation to implement all of these recommendations.

Climate Change Considerations

Although future climate change scenarios indicate that changes in precipitation, stream base flow and stream total flow are possible in the project area going forward, the models utilized have produced conflicting results, and provided no specific clarity regarding whether such environmental variables will undergo increases or decreases over time. In addition, because flows in four of the streams under study are subject to variation due to upstream diversions, human-mediated variation in stream flow parameters is likely to equal or exceed climate-driven variation in the near term.

SUMMARY AND FISH AND WILDLIFE SERVICE POSITION

Due to the potential presence of ESA-listed species, the current surveys at the six bridge sites concentrated on assessing the presence or absence of native *Megalagrion* damselflies and other native stream insects. Assessment of amphidromous native macrofauna, such as fishes and shrimps, was not specifically undertaken, since these species are all widespread within the Hawaiian Islands and none are ESA-listed, and instead relied upon data from previous DAR surveys.

Native *Megalagrion* damselflies were observed in the proximity of four of the six bridges proposed for repairs: Makanali, Puohokamoa, Kopiliula and Ulaino. Only two species of

Megalagrion were observed at these sites: the ESA-listed *M. pacificum* at Ulaino Stream, and the non-listed species *M. hawaiiense* at Makanali, Puohokamoa, and Kopiliula streams. One introduced damselfly species, *Ischura posita*, was present at Kailua, Makanali, Puohokamoa, and Kopiliula streams. Dragonflies were present at every stream surveyed, with the endemic Hawaiian giant dragonfly, *Anax strenuus*, present at Makanali and Ulaino streams, and the indigenous *Pantala flavescens* encountered at Kailua, Puohokamoa, Ulaino, and Mokulehua streams.

The most significant result of the current surveys was the discovery of a population of the ESA-listed *M. pacificum* along Ulaino Stream, not far upstream of the Hana Highway bridge. This species had not been previously documented from any stream along the north slope of Haeakala between lower Hanawi Stream at Nahiku and Kipahulu Valley beyond Hana, and its presence will necessitate an ESA Section 7 consultation for any work undertaken to modify the stream diversions at this site.

The discovery of this population at Ulaino led to additional reconnaissance surveys in adjacent catchments, which resulted in the discovery of yet another previously undocumented population not far upstream of the Hana Highway on Kawaihapapa Stream. Because the streams to the east of Nahiku occupy beds of Hana basalts that are difficult and treacherous to traverse, they have been undersampled by past survey efforts. The findings from the present survey suggest that the intermittent nature of flow in these systems has inhibited the upstream spread of invasive aquatic species, particularly poeciliid topminnows whose presence negatively correlates with that of *Megalagrion* species (Englund, 1999), and allowed persistence of *M. pacificum* colonies in this area.

Given these findings, the project as currently proposed does appear to pose potential risks to native aquatic trust resources occurring along the six streams where bridge repairs are proposed. Therefore, the current recommendations are provisional, pending examination of more finalized project designs for each of the six bridge sites. Given the presence of native diadromous fish and prawn species in all six stream systems, there is the possibility of indirect impacts to trust resources due to interdiction of upstream or downstream faunal passage, particularly if obstructions to the stream channel are created during floodwall construction, so care should be taken to avoid this. Similarly, the BMPs provided in this report should be followed during construction of all project elements to minimize impacts from entrained sediment on trust resource species inhabiting stream reaches downstream of the proposed project sites.

The current FWCA Planning Aid Report is sufficient to cover the scoping phase of the current project. As the project progresses to design and eventual construction, the DOT and HDR should continue to coordinate with the Service to avoid or minimize any potential environmental effects once Preferred Alternatives at each bridge site are selected. In particular, as the project proceeds to the design stage, then it is specifically recommended that a supplementary faunal survey be conducted at Ulaino Stream to more fully understand the distribution of ESA-listed damselflies both upstream and downstream of the proposed construction site. The Service also notes that any

changes to the proposed project scope will also require additional coordination with the Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii, and the State of Hawaii DLNR.

REFERENCES CITED

CWRM. 2009a. Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Units 6048, Puohokamoa. PR-2009-02. State of Hawaii, Dept. of Land and Natural Resources, Commission on Water Resource Management, Honolulu. 224 pp.

CWRM. 2009b. Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Units 6059, Kopiliula. PR-2009-10. State of Hawaii, Dept. of Land and Natural Resources, Commission on Water Resource Management, Honolulu. 185 pp.

CWRM. 2020. Instream Flow Standard Assessment Report, Island of Maui, Hydrologic Units 6040, Kailua. PR-2020-08. State of Hawaii, Dept. of Land and Natural Resources, Commission on Water Resource Management, Honolulu. 324 pp.

Englund, R. E. 1999. The impacts of introduced poecillid fish and Odonata on the endemic *Megalagrion* (Odonata) damselflies of Oahu Island, Hawaii. Journal of Insect Conservation 3 (3): 225–243.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. Online Rainfall Atlas of Hawai‘i. Bull. Amer. Meteor. Soc. 94, 313-316. doi: 10.1175/BAMS-D-11-00228.1.

Gingerich, S. B. 2009. Ground water occurrence and contribution to streamflow, Northeast Maui, Hawaii. U. S. Geological Survey Water-Resources Investgations Report 99-4090: 1-70.

Higashi, G., J. Parham, E. Lapp, S. Hau, D. Kuamoo, L. Nishiura, R. Shindo, R. Sakihara, T. Shimoda, R. Nishimoto & D. Polhemus. 2009. Report on Puohokamoa Stream, Maui, Hawaii. August 2009. Prepared by State of Hawaii, Division of Aquatic Resources *for* State of Hawaii, Commission on Water Resource Management. 29 pp.

Higashi, G., J. Parham, E. Lapp, S. Hau, D. Kuamoo, L. Nishiura, R. Shindo, R. Sakihara, T. Shimoda, & R. Nishimoto. 2009. Report on Kopiliula Stream, Maui, Hawaii. August 2009. Prepared by State of Hawaii, Division of Aquatic Resources *for* State of Hawaii, Commission on Water Resource Management. 29 pp.

Parham, J. E., G. R. Higashi, E. K. Lapp, D. G. K. Kuamoo, R. T. Nishimoto, S. Hau, J. M. Fitzsimmons, D. A. Polhemus and W. S. Devick. 2008. Atlas of Hawaiian Watersheds & Their Aquatic Resources. Island of Maui. Division of Aquatic Resources, Hawaii Department of Land and Natural Resources, Honolulu. xlvi + 866 pp.

Polhemus, D. A. 2019. Field Survey Report – East Maui Irrigation Ditch System, East Maui, Hawaii – Stream Diversion Abandonments. Native Damselfly Baseline Survey – Endangered Species Act. Pacific Islands Fish and Wildlife Office, Honolulu. 28 pp.

Polhemus, D. A., J. Maciolek and J. Ford. 1992. An ecosystem classification of inland waters for the tropical Pacific islands. Micronesica 25 (2): 155–173.

Sherrod, D. R., J. M. Sinton, S. E. Watkins, & K. M. Brunt. 2007. Geologic map of the State of Hawaii, Sheet 8 – Island of Maui. U. S. Geological Survey Open-File Report 2007-1089: Sheet 7 of 8, plus pamphlet.

Stearns, H.T. & G. A. MacDonald. 1942. Geology and Ground-Water Resources of the Island of Maui, Hawaii. Hawaii Division of Hydrography, Bulletin 7: i-xii + 1-344.

Takasaki, K.J., & G. Yamanaga, G. 1970. Preliminary report on the water resources of northeast Maui. State of Hawaii Department of Land and Natural Resources, Circular C60. 41 pp.

APPENDIX

PHOTOGRAPHS OF INDIVIDUAL BRIDGE SITES
AND ASSOCIATED AQUATIC HABITATS

Fig. 7. Kailua Stream bridge, 685 ft., looking upstream at span.

Fig. 8. Kailua Stream bridge, 685 ft., looking upstream below span.

Fig. 9. Kailua Stream, 685 ft., looking downstream from bridge.

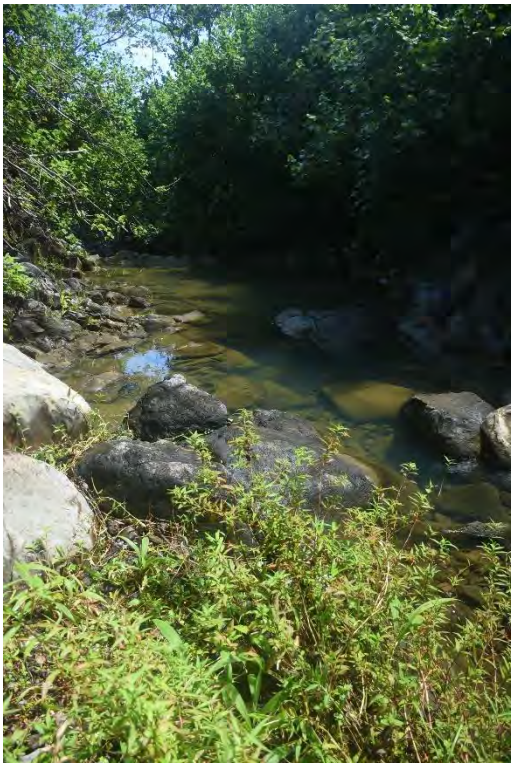


Fig. 10. Kailua Stream, 680 ft., looking downstream from beyond reach in Fig. 4.

Fig. 11. Makanali Stream bridge, 695 ft., looking upstream below span.

Fig. 12. Makanali Stream, 695 ft., looking downstream from span to lip of waterfall.

Fig. 13. Makanali Stream, 700ft., diversion wier and pool upstream from bridge.

Fig. 14. Makanali Stream,705 ft., looking small bedrock cascades upsteram of diversion.

Fig. 15. Puohokamoa Stream bridge, 575 ft., looking downstream toward span.

Fig. 16. Puohokamoa Stream bridge, 575 ft., scoured channel beneath span.

Fig. 17. Puohokamoa Stream, 575 ft., looking upstream from bridge.

Fig. 18. Puohokamoa Stream, 575 ft. looking downstream from bridge.

Fig. 19. Kopiliula Stream bridge, 1280 ft., looking east. Note integration of bridge with diversion.

Fig. 20. Kopiliula Stream, 1280 ft, looking west from span across diversion works.

Fig. 21. Kopiliula Stream area, 1280 ft., ditch adjacent to Hana Road immediately east of span.

Fig. 22. Kopiliula Stream bridge, 1280 ft., ditch inflow tunnel adjacent to eastern abutment.

Fig. 23. Kopiliula Stream, 1280 ft., looking upstream across diversion pool above bridge.

Fig. 24. Kopiliula Stream, 1280 ft, waterfall downstream of bridge.

Fig. 25. Kopiliula Stream, 1280 ft, waterfall downstream of bridge..

Fig. 26. Kopiliula Stream, 1280 ft, native damselfly species *Megalagrion hawaiiense*.

Fig. 27. Ulaino Stream bridge, 645 ft., looking downstream toward span.

Fig. 28. Ulaino Stream bridge, 645 ft., looking upstream beneath span.

Fig. 29. Ulaino Stream bridge, 645 ft., looking downstream from bridge.

Fig. 30. Ulaino Stream bridge, 645 ft., looking upstream from bridge.

Fig. 31. Ulaino Stream bridge, 645 ft., side pools immediately uptream of bridge on east side.

Fig. 32. Ulaino Stream bridge, 650 ft., looking downstream at pools beneath span.

Fig. 33. Ulaino Stream bridge, 650 ft., pools in bedrock channel above bridge, looking upstream.

Fig. 34. Ulaino Stream bridge, 650 ft., side pool above bridge, habitat for *Megalagrion pacificum*.

Fig. 35. Mokulehua Stream bridge, 525 ft., downstream beneath span.

Fig. 36. Mokulehua Stream, 525 ft., looking downstream from bridge toward lip of falls.

Fig. 37. Mokulehua Stream bridge, 525 ft., looking upstream from bridge.

Fig. 38. Mokulehua Stream bridge, 525 ft., falls upstream of bridge with water emerging from cave

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
720-963-3688
thomas.w.parker@dot.gov

February 12, 2019

In Reply Refer To:
HFPM-16

Mr. Ivan Lay, Chair
Maui County Cultural Resources Commission
c/o Maui County Department of Planning
2200 Maui Street
One Maui Plaza, Suite 315
Wailuku, HI 96793

Attn: Annalise Kehler

Subject: Project Discussion for the FHWA/HDOT Hana Highway Bridge Improvements Project

Dear Chairperson Lay:

The Federal Highway Administration Central Federal Lands Highway Division (FHWA-CFLHD), in cooperation with the State of Hawaii Department of Transportation (HDOT), is performing environmental and engineering studies to improve six of the historic bridges along Hana Highway (Route 360) on the island of Maui. FHWA-CFLHD appreciates the opportunity to be included on the agenda for the March 7, 2019 Maui County Cultural Resources Commission meeting so that the Hana Highway Bridge Improvements Project can be discussed.

FHWA-CFLHD and HDOT are evaluating the following six bridges for potential improvement.

- Bridge #2 – Kailua Stream Bridge (Mile Post [MP] 5.9)
- Bridge #5 – Makanali Stream Bridge (MP 8.2)
- Bridge #8 – Puohokamoa Stream Bridge (MP 11.0)
- Bridge # 19 – Kopiliula Stream Bridge (MP 21.7)
- Bridge #39 – Ulaino Stream Bridge (MP 27.9)
- Bridge #40 – Mokulehua Stream Bridge (MP 28.3)

These bridges are located within the National Register of Historic Places (NRHP)-listed Hana Belt Road historic district (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) (please see enclosed Project Location Map).

Overarching goals for the project were developed through an earlier planning process for all bridges on the route. The six bridges now being studied in more detail have been identified by HDOT as high priority for improvements.

The proposed bridge improvements will strive to meet the following project goals, as reflected in the *2015 Hana Highway, Route 360 Bridge Preservation Plan*, and/or determined by CFLHD and HDOT. These goals will continue to be refined throughout the life of the project.

- Retain the historic and rural character of the bridges
- Exercise sensitivity to cultural and historically significant sites and practices
- Preserve the existing road configuration and narrow one-lane nature of the bridges
- Provide context sensitive design options
- Meet a load-carrying capacity of 40 tons
- Provide for a 16-foot wide roadway (curb-to-curb)
- Provide crash-tested railings for vehicular safety
- Deliver a solution that meets current seismic design criteria
- Minimize impacts to the traveling public
- Minimize impacts to environmental and scenic resources
- Manage overall project costs
- Manage overall construction schedule

This project is federally funded and considered a federal undertaking, and therefore will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006) and other applicable laws and regulations. Through Hawaii Act 048 (Act 218 extension), this project is temporarily exempt from state and county permitting requirements. Nonetheless, FHWA-CFLHD and HDOT will be preparing relevant environmental analyses.

As FHWA-CFLHD seeks to develop a context-sensitive solution that balances the desired transportation goals appropriate for this distinctive cultural and natural environment, we kindly ask for input from the Maui County Cultural Resources Commission. Enclosed with this letter are project maps as well as photographs and information for the bridges included in this project. We look forward to obtaining the Commission's input through the Section 106 and environmental process to help shape this important project.

If you have any questions or concerns or if you require additional information, please contact me by telephone at (720) 963-3688 or by email at thomas.w.parker@dot.gov.

Sincerely,

Thomas W. Parker
Project Manager

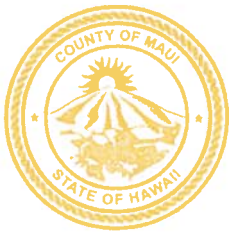
Enclosures:

- Project location map
- Bridge information fact sheets

MICHAEL P. VICTORINO
MAYOR

MICHELE CHOUTEAU MCLEAN, AICP
DIRECTOR

JORDAN E. HART
DEPUTY DIRECTOR



DEPARTMENT OF PLANNING
COUNTY OF MAUI
ONE MAIN PLAZA, 2200 MAIN STREET, SUITE 315
WAILUKU, MAUI, HAWAII 96793

March 8, 2019

Mr. Thomas W. Parker
U.S. Department of Transportation,
Federal Highways Administration,
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380
Lakewood, Colorado 80228

Dear Mr. Parker:

RE: PRELIMINARY NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION WITH THE CULTURAL RESOURCES COMMISSION REGARDING THE PROPOSED HANA HIGHWAY BRIDGE IMPROVEMENTS PROJECT, INVOLVING THE FOLLOWING BRIDGES ALONG HANA HIGHWAY (ROUTE 360): KAILUA STREAM BRIDGE, MAKANALI STREAM BRIDGE, PUOHOKAMOA STREAM BRIDGE, KOPILIULA STREAM BRIGE, ULAINO STREAM BRIDGE, AND MOKULEHUA STREAM BRIDGE

At its March 7, 2019 meeting, the Cultural Resources Commission (Commission) received a presentation regarding the Hana Highway Bridge Improvement Project (Project). The Commission also discussed your division's invitation to participate in preliminary Section 106 consultation for the Project.

With respect to the request for input in your division's letter dated February 12, 2019, the Commission offered the following comments:

1. As the project progresses, the Commission wants to be consulted on the following issues: identification of the Areas of Potential Effects; review of cultural, archaeological, and architectural studies and surveys; and design review for bridge improvements.
2. The unique character of each bridge is what makes them so special. Improvements should be sensitive to the uniqueness of each bridge and maintain historic character.

3. The original bridges should be preserved and retained to the extent possible. There is important *moolelo* tied to each one of these bridges. If the bridges are reconstructed, they will lose that *moolelo*.
4. Original name and date stamps are important aspects of these bridges. Special care should be taken to preserve these. If a bridge has to be reconstructed, the original name and date stamps should be incorporated into the new design. Additionally, reconstructed bridges should note the date of reconstruction.
5. On the topic of keeping the bridges single-lane, the Commission has mixed feelings. One commissioner recommends that you consult with the Hana community to see if they truly want the bridges to remain single-lane. Several other commissioners feel that the single-lane bridges are part of what makes the Road to Hana so special – they force drivers to go slowly and appreciate the beauty of their surroundings.
6. When the project comes back for design review, the Commission requests side-by-side comparisons of the existing bridges and proposed improvements. The plans for the proposed improvements should clearly show materials and details.

Should you have any questions or require additional clarification, please contact Annalise Kehler, Cultural Resources Planner, at (808) 270-7506.

Sincerely,

MICHELE CHOUTEAU MCLEAN, AICP
Planning Director

xc: Thomas W. Parker, Federal Highway Administration, thomas.w.parker@dot.gov (PDF)
CRC File (K:\WP_DOCS\PLANNING\CRC\2019\Communications to CRC\Section 106 Consultation - Hana Hwy Bridges)

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U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380A
Lakewood, CO 80228-2583
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

October 1, 2019

In Reply Refer To:
HFPM-16

To: Honorable Suzanne Case, Chairperson
Department of Land and Natural Resources

Attn: Suzanne Case
State Historic Preservation Officer

From: J. Michael Will, P.E.
Project Manager

Subject: National Historic Preservation Act, Section 106 Consultation for the Hāna Highway Bridge Improvements

Hāmākualoa and Koʻolau Districts, Maui Island, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Dear Ms. Case:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is performing environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see Attachment A, Figures 1-5). The proposed project is considered a federal action and undertaking, and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). This letter is to continue consultation with the State Historic Preservation Division (SHPD) under Section 106 in accordance with Title 36 of the *Code of Federal Regulations* (CFR), Section 800.3 and request concurrence on the Area of Potential Effects (APE).

Please note that under Hawaii Act 048 (Act 218 extension), which provides temporary exemptions from certain state and county requirements to expedite construction of bridge rehabilitation and replacement projects, this project is exempt from Chapter 6E of the Hawaii

Revised Statutes (HRS) regarding historic preservation. Therefore, we are not requesting consultation under HRS 6E for this project.

A project overview meeting was held with your office on March 8, 2019 to introduce the project, discuss project scope, project background, and resource documentation developed thus far. The purpose of this meeting was to also obtain early feedback from SHPD on considerations related to the APE, eligibility, project design, and the Section 106 process.

Overview of the Undertaking

The overall purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

Specific design objectives and potential improvement alternatives are currently being developed through full engineering and environmental analysis. This effort is being undertaken in coordination with your office, as well as other interested parties such as the public, Native Hawaiian organizations (NHOs), local businesses, emergency responders, and relevant governmental and non-governmental agencies. Multiple factors will inform the design process including considerations such as the historic character of the roadway and its bridges, minimization of construction impacts, including impacts to natural and cultural resources as well as traffic and access impacts, design/service life, cost-effectiveness, and consistency with applicable design and safety criteria. Improvement actions may involve rehabilitation or reconstruction of the bridges or individual bridge elements to address structural issues, inadequate load capacity, and safety deficiencies. Due to the lack of available traffic detours, temporary structures may need to be erected adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the Area of Potential Effects (APE) for the project.

Area of Potential Effects

The archaeological and historic architectural Area of Potential Effects (APE) is illustrated in the enclosed figures (Attachment A, Figures 6-11), and includes potential temporary and permanent impact areas. The APE comprises 8.8 acres and includes Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

- Bridge #2, Kailua Stream Bridge (MP 5.9): [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015
- Bridge #5, Makanali Stream Bridge (MP 8.2): [2] 1-1-001:036 and 042
- Bridge #8, Puohokamoa Stream Bridge (MP 11.0): [2] 1-1-001:022, 023, 044, and 052

- Bridge #19, Kopiliula Stream Bridge (MP 21.7): [2] 1-2-001:003, [2] 1-2-004:005
- Bridge #39, Ulaino Stream Bridge (MP 27.9): [2]-1-2-003:001 and 005
- Bridge #40, Mokulehua Stream Bridge (MP 28.3): [2] 1-2-003:001, 005, [2] 1-3-002:020 and 023
- Additional Potential Staging Areas: [2] 1-2-001:003 and [2] 1-2-004:005

Historic Property Identification Efforts

FHWA-CFLHD has contracted with HDR and its subconsultants, SCS and Fung Associates, to aid in the inventory efforts to identify historic properties that may be affected by the proposed undertaking. The six bridges included in this project are located within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) and have been documented through past inventory and nomination efforts. In 2015, an Archaeological Literature Review for the Hana Highway, Route 360, Bridge Preservation Plan within the Hana Highway Historic District was prepared which provides a summary of the cultural historical background and information on existing archaeological conditions, as well as the potential for encountering sensitive sites. As part of this project's inventory efforts, SCS will be performing a full archaeological inventory survey (AIS) of the APE. The purpose of this survey is to identify historic properties that may be affected by the proposed undertaking. The survey will include archival research, consultation, and field survey and analysis. Enclosed with this letter is a summary of SCS's field survey approach for the Hāna Highway Bridge Improvements Project.

Consultations

Consultations have been initiated and will continue with the Maui County Cultural Resources Commission and the Historic Hawaii Foundation. The public will also be continually engaged throughout project development. Project information and the enclosed APE is also being sent to the following Native Hawaiian organizations and Native Hawaiian descendants that may have ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. These include:

- Aha Moku O Maui, Inc., including Moku O Hana, Hamakualoa, Hamakuapoko, Kahikinui, Kaupo, Koolau, and Kipahulu
- Aha Moku Advisory Committee
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawaii
- Brian Kaniela Naeʻole Naauao
- Council for Native Hawaiian Advancement
- Friends of ʻIolani Palace
- Friends of Mokuʻula, Inc.
- George K. Cypher ʻOhana
- Hawaiian Civic Club of Hilo
- Hui Huliau, Inc.
- Kamehameha Schools - Community Relations and Communications Group, Government Relations
- Kanu o ka ʻĀina Learning ʻOhana
- Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
- Maui Lanaʻi Island Burial Council
- Na Aikane O Maui
- Na Koa Ikaika Ka Lahui Hawaii
- Native Hawaiian Economic Alliance
- Nekaifes Ohana
- Koʻolau Foundation

- Na Koa Ikaika Ka Lahui Hawaii
- Nā Kuleana o Kānaka ʻŌiwi
- Office of Hawaiian Affairs
- Order of Kamehameha I
- Papa Ola Lokahi
- Paukukalo Hawaiian Homes Community Association
- The I Mua Group
- The Makua Group

Request for Concurrence

We request your concurrence with the Area of Potential Effects. Please also provide any input or comments you may have regarding FHWA-CFLHD's proposed methodology for the AIS. Lastly, if you are aware of any additional person or organization that is knowledgeable or has cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

We would appreciate a written response within 30 days from date of receipt, by email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380A, Lakewood, CO 80228-2583. Please feel free to contact Lisa Hemesath, Environmental Protection Specialist, at (720) 963-3473, email: Lisa.Hemesath@dot.gov, if you have any questions. We look forward to working with the SHPO on these needed improvements.

Sincerely yours,

JON MICHAEL WILL Digitally signed by JON MICHAEL WILL
Date: 2019.10.01 09:54:19 -06'00'

J. Michael Will, P.E.
Project Manager

Enclosures:

- Attachment A: Figures
  - Figure 1, Overview of Bridge Locations
  - Figures 2-5, Topographic Map Overview of Bridge Locations
  - Figures 6-11, Area of Potential Effects Map for each Bridge
- Attachment B: SCS Field Survey Approach

cc (via email with digital enclosures):
Susan Lebo, SHPD
Tanya Gumapac-McGuire, SHPD
Misako Mimura, HDOT
Kevin Ito, HDOT
Andrew Hirano, HDOT
Karen Chun, HDOT
Curtis Matsuda, HDOT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

November 1, 2019

IN REPLY REFER TO:
Log No.: 2019.02196
Doc. No.: 1911SH02
Archaeology

J. Michael Will, P.E.
Central Federal Lands Highway Division
U.S. Department of Transportation, Federal Highway Administration
12300 West Dakota Avenue, Suite 380A
Lakewood, Colorado 80228-2583
Email: Michael.Will@dot.gov

Dear J. Michael Will:

SUBJECT: **National Historic Preservation Act (NHPA) Section 106 Review – Request for Concurrence with the Area of Potential Effect**
Hāna Highway Bridge Improvements, Ref. No. HFPM-16
Puʻuomāile, Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa, Hāmākualoa and Koʻolau Districts, Island of Maui
TMK: (2) 1-1-001:022, 023, 036, 042, 044, and 052, (2) 1-2-001:003, (2) 1-2-004:005, (2) 1-2-003:001 and 005, (2) 1-3-002:020 and 023, (2) 2-9-010:001, (2) 2-9-014:001, (2) 2-9-012:041, (2) 2-9- 013:015, and Hāna Highway Right-of-Way

The State Historic Preservation Division (SHPD) received a letter dated October 1, 2019 from the Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD) to initiate consultation and to request concurrence with the Area of Potential Effect (APE) for the Hāna Highway Bridge Improvements project on the island of Maui. The SHPD received this submittal on October 2, 2019.

The FHWA CFLHD has determined that the proposed project, which will be carried out in coordination with the Hawaiʻi Department of Transportation (HDOT), is a federal undertaking as defined in 36 CFR 800.16(y). The proposed undertaking is subject to compliance with Section 106 of the NHPA. The FHWA CFLHD asserts that under Hawaii Act 048 (Act 218 extension), which provides temporary exemptions from certain state and county requirements to expedite construction of bridge rehabilitation and replacement projects, this project is exempt from Chapter 6E of the Hawaii Revised Statutes (HRS) regarding historic preservation. Therefore, FHWA CFLHD will not be conducting consultation under HRS 6E for this project.

The APE is described as potential temporary and permanent impact areas comprising 8.8 acres that includes the Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

Bridge #2, Kailua Stream Bridge (MP 5.9): (2) 2-9-010:001, (2) 2-9-014:001, (2) 2-9- 012:041, (2) 2-9-013:015

Bridge #5, Makanali Stream Bridge (MP 8.2): (2) 1-1-001:036 and 042

Bridge #8, Puohokamoa Stream Bridge (MP 11.0): (2) 1-1-001:022, 023, 044, and 052

Bridge #19, Kopiliula Stream Bridge (MP 21.7): (2) 1-2-001:003; (2) 1-2-004:005

Bridge #39, Ulaino Stream Bridge (MP 27.9): (2) 1-2-003:001 and 005

Bridge #40, Mokulehua Stream Bridge (MP 28.3): (2)] 1-2-003:001, 005; (2) 1-3-002:020 and 023
Additional Potential Staging Areas: (2) 1-2-001:003 and (2) 1-2-004:005

Based on the information received, the State Historic Preservation Officer (SHPO) has no objections to the APE as it is defined.

The proposed project involves performing environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3). The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards. Multiple factors will inform the design process including considerations such as the historic character of the roadway and its bridges, minimization of construction impacts, including impacts to natural and cultural resources as well as traffic and access impacts, design/service life, cost-effectiveness, and consistency with applicable design and safety criteria. Improvement actions may involve rehabilitation or reconstruction of the bridges or individual bridge elements to address structural issues, inadequate load capacity, and safety deficiencies. Due to the lack of available traffic detours, temporary structures may need to be erected adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the APE for the project.

The six bridges included in this project are located within the National Register of Historic Places (NRHP) listed Hāna Belt Road Historic District (NRHP Reference #01000615 / SIHP No. 50-50-va-01638) and have been documented through past inventory and nomination efforts. The FHWA CFLHD notes that as part of this project's inventory efforts, Scientific Consultant Services (SCS) will be performing a full archaeological inventory survey (AIS) of the APE. The purpose of this survey is to identify historic properties that may be affected by the proposed undertaking. The survey will include archival research, consultation, and field survey and analysis. Enclosed with FHWA CFLHD's letter is a summary of SCS's field survey approach for the Hāna Highway Bridge Improvements Project. In response to the request for input on the proposed methodology, the SHPD recommends testing only occur in areas where the proposed project will require ground disturbance and that said testing reach the depths of proposed construction disturbance and the testing units (e.g., shovel test pits) must be of sufficient diameter to allow for recordation of soil stratigraphy and photographic documentation using N arrow and scale.

The SHPD looks forward to continuing the Section 106 process for the proposed project.

The HDOT and FHWA are the offices of record for this undertaking. Please maintain a copy of this letter with your environmental review record for this undertaking.

Please contact Stephanie Hacker, Historic Preservation Archaeologist IV, at Stephanie.Hacker@hawaii.gov or at (808) 692-8046 for matters regarding archaeological resources or this letter.

Aloha,

Susan A. Lebo

Signed For
Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Lisa Hamesath, FHWA CFLHD (Lisa.Hamesath@dot.gov)

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

October 9, 2019

In Reply Refer To:
HFPM-16

Ms. Kiersten Faulkner
Executive Director
Historic Hawaii Foundation
680 Iwilei Road, Suite 690
Honolulu, HI 96817

Subject: National Historic Preservation Act, Section 106 Consultation for the Hāna Highway Bridge Improvements Project

Hāmākualoa and Koʻolau Districts, Maui Island, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Dear Ms. Faulkner:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is conducting environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kōpiliʻula Stream Bridge (MP 21.7), Ulaʻino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see Attachment A, Figures 1-5).

The proposed project is considered a federal action and undertaking and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). FHWA-CFLHD held a meeting with Historic Hawaii Foundation staff on March 8, 2019 for which preliminary project information was shared and discussed. In this meeting, the Historic Hawaii Foundation also shared feedback on important factors that should be considered as the project moves forward into the environmental and design process. This letter is to continue consultation under Section 106 and provide information on the project's Area of Potential Effects (APE) and historic property identification process.

Overview of the Undertaking

The overall purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-

maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

Specific design objectives and potential improvement alternatives are currently being developed through full engineering and environmental analysis. This effort is being undertaken in coordination with the Hawaii State Historic Preservation Division (SHPD), Native Hawaiian organizations (NHOs), and other interested parties such as the public, local businesses, emergency responders, and relevant governmental and non-governmental agencies. Multiple factors will inform the design process including considerations such as the historic character of the roadway and its bridges, minimization of construction impacts, including impacts to natural and cultural resources as well as traffic and access impacts, design/service life, cost-effectiveness, and consistency with applicable design and safety criteria. Improvement actions may involve rehabilitation or reconstruction of the bridges or individual bridge elements to address structural issues, inadequate load capacity, and safety deficiencies. Due to the lack of available traffic detours, temporary structures may need to be erected adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the Area of Potential Effects (APE) for the project.

Area of Potential Effects

The archaeological and historic architectural Area of Potential Effects (APE) is illustrated in the enclosed figures (Attachment A, Figures 6-11), and includes potential temporary and permanent impact areas. The APE comprises 8.8 acres and includes Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

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- Bridge #8, Puohokamoa Stream Bridge (MP 11.0): [2] 1-1-001:022, 023, 044, and 052
- Bridge #19, Kōpiliʻula Stream Bridge (MP 21.7): [2] 1-2-001:003, [2] 1-2-004:005
- Bridge #39, Ulaʻino Stream Bridge (MP 27.9): [2]-1-2-003:001 and 005
- Bridge #40, Mokulehua Stream Bridge (MP 28.3): [2] 1-2-003:001, 005, [2] 1-3-002:020 and 023
- Additional Potential Staging Areas: [2] 1-2-001:003 and [2] 1-2-004:005

Historic Property Identification Efforts

FHWA-CFLHD has contracted with HDR and its subconsultants, SCS and Fung Associates, to aid in the inventory efforts to identify historic properties that may be affected by the proposed undertaking. The six bridges included in this project are located within the National Register of

Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) and have been documented through past inventory and nomination efforts. As part of this project's inventory efforts, SCS will be performing a full archaeological inventory survey (AIS) of the APE. The purpose of this survey is to identify historic properties that may be affected by the proposed undertaking. The survey will include archival research, consultation, and field survey and analysis.

Your knowledge of the area is of great value. We seek your assistance in FHWA and HDOT's efforts to identify historic properties. We welcome any comments you may have on the project's Area of Potential Effects or information you may wish to share. In addition, if you are aware of any person or organization that is knowledgeable or has cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

A response within 30 days would be appreciated. Our agency will continue to share project information with your organization for review and input as it becomes available. We very much appreciate your continued engagement to help shape this important project. Please provide written response to me by email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228.

Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3689, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

Enclosures:

- Attachment A: Figures
  - Figure 1, Overview of Bridge Locations
  - Figures 2-5, Topographic Map Overview of Bridge Locations
  - Figures 6-11, Area of Potential Effects Map for each Bridge

cc (via electronic mail):

Dr. Susan Lebo, SHPD
Tanya Gumapac-McGuire, SHPD
Misako Mimura, HDOT
Kevin Ito, HDOT
Andrew Hirano, HDOT
Karen Chun, HDOT
Curtis Matsuda, HDOT
Robin Shishido, HDOT

HISTORIC HAWAIʻI FOUNDATION

680 Iwilei Road Suite 690, Honolulu HI 96817 • (808) 523-2900 • preservation@historichawaii.org • www.historichawaii.org

November 15, 2019

J. Michael Will, P.E.
Project Manager
Central Federal Lands Highway Division
Federal Highway Administration, U.S. Department of Transportation
12300 West Dakota Avenue, Suite 380
Lakewood, CO 80228

Via email to: Michael.Will@DOT.gov

Re: National Historic Preservation Act, Section 106 Consultation
for the Hāna Highway Bridge Improvements Project
Hāmākua and Koʻolau Districts, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa, Island of Maui; Hawaiʻi

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2] 1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Project reference # HFPM-16

Dear Mr. Will,

Thank you for referring the above-mentioned project to Historic Hawaiʻi Foundation (HHF) under Section 106 of the National Preservation Act (NHPA). HHF received FHWA's letter dated October 17, 2019 initiating consultation (received via mail on October 21, 2019), containing the scope of work and attached exhibits. HHF accepts the invitation to participate in the Section 106 consultation for the Hāna Highway Bridge Improvement Project and efforts to avoid, minimize and mitigate adverse effects on historic properties.

Historic Hawaiʻi Foundation is a statewide nonprofit organization established in 1974 to encourage the preservation of sites, buildings, structures, objects and districts that are significant to the history of Hawaiʻi. HHF is a consulting party to the Federal Highway Administration and its state and local partners pursuant to the implementing regulations of the NHPA at 36 Part 800.2(c)(5) as an organization with a demonstrated interest in the undertaking and a concern for the effects on historic properties.

HHF participated in a pre-consultation meeting with Central Federal Land Highway Division (CFLHD) on March 8, 2019. The current consultation addresses the project's Area of Potential Effects (APE) and the identification of historic properties.

Undertaking: The project proposes to "improve" six of the historic bridges along Hāna Highway (Route 360) on the Island of Maui.

HHF requests additional information on the purpose and need for the undertaking and the scope of the "improvements." FHWA's letter mentions goals for consistency for bridge width and railings, as well as concerns with load capacity and meeting seismic standards. The Section 106 consultation should include information on the perceived issues and inadequacies, as well as a thorough assessment of alternatives that would avoid inappropriate use and adverse effect of a historic property.

APE: The Area of Potential Effect (APE) for each of the six bridges is identified and mapped in the enclosure provided in CFL's letter of October 17, 2019.

Historic Hawai'i Foundation is concerned that the APE is limited to the footprint of direct physical activity at each of the six sites. The APE should include the bridges and roadway over which heavy equipment would cross to reach each construction site as the intermediate bridges could potentially by affected by the loads.

Identification of Historic Resources:
Historic Hawai'i Foundation appreciates the copies of the background information for each of the six bridges provided at the March meeting, which were excerpted from the Hawai'i Department of Transportation's Hāna Bridges Preservation Plan (2015).

We understand further that FHWA has retained qualified preservation professionals in the fields of archaeology, architectural history and Hawaiian history and culture to identify and inventory historic properties (other than the bridges) that may be affected by the proposed undertaking.

Historic Hawai'i Foundation supports FHWA's proposal to conduct a more in-depth inventory and continuing efforts to identify historic properties. In addition, FHWA should note that the entire highway is listed as a historic district, of which the bridges are contributing structures. The bridges are also individually eligible for the National Register of Historic Places. Three of the six bridges are rated "exceptional" and are deemed the highest priority for preservation.

Potential Effects of the Undertaking on Historic, Cultural and Community Resources
FHWA's consultation letter notes that, "specific design objectives and potential improvement alternatives are currently being developed" and requests any additional information or input related to the project.

HHF strongly holds the position that the project design be based on the treatment recommendations from the HDOT's Hāna Bridges Preservation Plan and the Secretary of the Interior's Standards for the Treatment of Historic Properties for all historic resources. In particular, HHF expects that the contributing

structures within the Hāna Belt Road Historic District will be high priorities for preservation, retention and appropriately-designed structural improvements for safety and longevity. Please see the attached table excerpting the Preservation Plan's recommendations for each of the subject bridges. HHF was a consulting party to HDOT in developing the preservation plan and expects that its treatments will be carried through to all subsequent projects within the district. The planning effort included stakeholders from the affected communities, historic preservation interests, subject matter experts and technical guidance to strike an appropriate balance between needs for the use and enjoyment of the historic highway.

As with other historic bridge projects in Hawai'i, we reiterate our strong recommendation that FHWA and HDOT invest in developing a railing prototype that matches the most common historic railing features that would also meet modern safety standards. This up-front work would then guide all future projects that have the potential to affect historic railings. This is especially relevant for Hāna Highway, as we anticipate additional bridge projects within the district will follow for many years.

Thank you for the opportunity to comment on this undertaking under the National Historic Preservation Act Section 106. Historic Hawai'i Foundation looks forward to continuing consultation to resolve the outstanding issues and avoid, minimize or mitigate any adverse effects on historic properties and cultural resources.

Very truly yours,

Kiersten Faulkner

Kiersten Faulkner, AICP
Executive Director

Attachment A: HDOT's Hāna Bridges Preservation Plan Treatment Recommendations for Six Bridges

Copies via email:
FHWA: Meesa Otani
SHPD: Tanya Gumapac-McGuire, Susan Lebo

Hāna Highway Bridges by CFL

Attachment A

	Bridge	Date	Historic Rating	2015 Preservation Plan Recommendation	
2	**Kailua**	1929	Contributing, open picket	• Retain existing historic railings • Add detached crash-tested rail across interior face of historic railings • Preserve exemplary natural rock formation	
5	**Makanali**	1928	Contributing, open picket	• Replace railings with best match open picket TL-2 crash-tested railings • Remove and replace CRM abutments and CRM wingwalls with reinforced concrete walls with new natural rock façades	
8	**Puohokamoa**	1912	Exceptional, distinctive solid railing & date	• Retain historic downstream parapet • Add detached crash-rail across interior face of historic downstream parapet • Replace upstream side parapet with best match TL-2 crash-tested railings	
19	**Kopiliula**	1926	Exceptional, EMI equipment	• Exemption on HDOT 16 feet width criteria • Retain historic parapets • Exemption on crash-testing to meet TL-1 criteria • Dam and sluice gate equipment is an integral part of the EMI aqueduct system and must remain in place	
39	**Ulaino**	1914	Contributing, open picket	• Replace railings with best match open picket TL-2 crash-tested railings • Remove and replace CRM abutments and wingwalls with reinforced concrete walls with new natural rock façades	
40	**Mokulehua**	1908	Exceptional, oldest on Maui and 3rd oldest in Hawaii	• Retain historic downstream parapet • Add detached crash-tested rail across interior face of historic downstream parapet • Replace upstream side parapet with new best match TL-2 solid crash-tested railing	

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

October 9, 2019

In Reply Refer To:
HFPM-16

Mr. Keʻeaumoku Kapu
Chief Executive Officer
Aha Moku o Maui Inc.
P.O. Box 11524
Lahaina, HI 96761

Subject: National Historic Preservation Act, Section 106 Consultation for the Hāna Highway Bridge Improvements Project

Hāmākualoa and Koʻolau Districts, Maui Island, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Dear Mr. Keʻeaumoku Kapu:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is conducting environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kōpiliʻula Stream Bridge (MP 21.7), Ulaʻino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see Attachment A, Figures 1-5).

The proposed project is considered a federal action and undertaking and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3, by providing information and/or by requesting to be a consulting party.

Overview of the Undertaking

The overall purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified

overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

Specific design objectives and potential improvement alternatives are currently being developed through full engineering and environmental analysis. This effort is being undertaken in coordination with the Hawaii State Historic Preservation Division (SHPD), Native Hawaiian organizations (NHOs), and other interested parties such as the public, local businesses, emergency responders, and relevant governmental and non-governmental agencies. Multiple factors will inform the design process including considerations such as the historic character of the roadway and its bridges, minimization of construction impacts, including impacts to natural and cultural resources as well as traffic and access impacts, design/service life, cost-effectiveness, and consistency with applicable design and safety criteria. Improvement actions may involve rehabilitation or reconstruction of the bridges or individual bridge elements to address structural issues, inadequate load capacity, and safety deficiencies. Due to the lack of available traffic detours, temporary structures may need to be erected adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the Area of Potential Effects (APE) for the project.

Area of Potential Effects

The archaeological and historic architectural Area of Potential Effects (APE) is illustrated in the enclosed figures (Attachment A, Figures 6-11), and includes potential temporary and permanent impact areas. The APE comprises 8.8 acres and includes Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

- Bridge #2, Kailua Stream Bridge (MP 5.9): [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015
- Bridge #5, Makanali Stream Bridge (MP 8.2): [2] 1-1-001:036 and 042
- Bridge #8, Puohokamoa Stream Bridge (MP 11.0): [2] 1-1-001:022, 023, 044, and 052
- Bridge #19, Kōpiliʻula Stream Bridge (MP 21.7): [2] 1-2-001:003, [2] 1-2-004:005
- Bridge #39, Ulaʻino Stream Bridge (MP 27.9): [2]-1-2-003:001 and 005
- Bridge #40, Mokulehua Stream Bridge (MP 28.3): [2] 1-2-003:001, 005, [2] 1-3-002:020 and 023
- Additional Potential Staging Areas: [2] 1-2-001:003 and [2] 1-2-004:005

Historic Property Identification Efforts

FHWA-CFLHD has contracted with HDR and its subconsultants, SCS and Fung Associates, to aid in the inventory efforts to identify historic properties that may be affected by the proposed undertaking. The six bridges included in this project are located within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference # 01000615 /

SIHP # 50-50-va-01638) and have been documented through past inventory and nomination efforts. As part of this project’s inventory efforts, SCS will be performing a full archaeological inventory survey (AIS) of the APE. The purpose of this survey is to identify historic properties that may be affected by the proposed undertaking. The survey will include archival research, consultation, and field survey and analysis.

Your knowledge of the area is of great value. We seek your assistance in FHWA and HDOT’s efforts to identify historic properties and evaluate the project’s potential to affect properties. We would appreciate any information or concerns you may wish to share and, in particular, if there are any resources or places of traditional cultural or religious importance that might be affected by this undertaking. In addition, if you are acquainted with any person or organization that is knowledgeable about the proposed project area, or any descendants with ancestral, lineal, or cultural ties to or cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information. A response within 30 days would be appreciated, should you have concerns about this project and/or wish to be a consulting party. Please provide written response to me by email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228.

Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3689, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

Enclosures:
Attachment A: Figures
- Figure 1, Overview of Bridge Locations
- Figures 2-5, Topographic Map Overview of Bridge Locations
- Figures 6-11, Area of Potential Effects Map for each Bridge

cc (via electronic mail):
- Dr. Susan Lebo, SHPD
- Tanya Gumapac-McGuire, SHPD
- Misako Mimura, HDOT
- Kevin Ito, HDOT
- Andrew Hirano, HDOT
- Karen Chun, HDOT
- Curtis Matsuda, HDOT
- Robin Shishido, HDOT

LIST OF ADDITIONAL RECIPIENTS OF SAME LETTER

Potential Section 106 Consulting Party Recipient List (Letter Dated October 9, 2019)

1. Aha Moku O Maui, Inc., including Moku O Hāna, Hāmākualoa, Hāmākuapoko, Kahikinui, Kaupō, Koʻolau, and Kipahulu
2. Aha Moku Advisory Committee
3. Association of Hawaiian Civic Clubs
4. Association of Hawaiians for Homestead Lands
5. Au Puni O Hawaii
6. Brian Kaniela Naeʻole Naauao
7. Council for Native Hawaiian Advancement
8. Friends of ʻIolani Palace
9. Friends of Mokuʻula, Inc.
10. George K. Cypher ʻOhana
11. Hawaiian Civic Club of Hilo
12. Hui Huliau, Inc.
13. Kamehameha Schools - Community Relations and Communications Group, Government Relations
14. Kanu o ka ʻĀina Learning ʻOhana
15. Koʻolau Foundation
16. Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
17. Maui Lanaʻi Island Burial Council
18. Na Aikane O Maui
19. Na Koa Ikaika Ka Lahui Hawaii
20. Native Hawaiian Economic Alliance
21. Nekaifes Ohana
22. Office of Hawaiian Affairs
23. Order of Kamehameha I
24. Papa Ola Lokahi
25. Paukukalo Hawaiian Homes Community Association
26. The I Mua Group
27. The Makua Group

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

October 17, 2019

In Reply Refer To:
HFPM-16

Ms. Tanya Lee-Greig, Chair
Maui County Cultural Resources Commission
c/o Maui County Department of Planning
2200 Maui Street
One Maui Plaza, Suite 315
Wailuku, HI 96793

Attn: Annalise Kehler

Subject: National Historic Preservation Act, Section 106 Consultation for the Hāna Highway Bridge Improvements Project

Hāmākualoa and Koʻolau Districts, Maui Island, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Dear Ms. Lee-Greig:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is conducting environmental and engineering studies to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see Attachment A, Figures 1-5).

The proposed project is considered a federal action and undertaking and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Through Hawaii Act 048 (Act 218 extension), this project is temporarily exempt from state and county permitting requirements. Nonetheless, FHWA-CFLHD and HDOT will be preparing relevant environmental analyses. FHWA-CFLHD attended a Maui County Cultural Resources Commission meeting on March 7, 2019 for which the Commission shared feedback on important factors that should be considered as the project moves forward into the environmental and design process. The Commission also requested continued involvement in the project's Section 106

process. This letter is to continue consultation under Section 106 and provide information on the project's Area of Potential Effects (APE) and historic property identification process.

Overview of the Undertaking

The overall purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The identified overarching goals include improving the bridges to make them more consistent with current standards and guidelines for load capacity, bridge railing and transitions, bridge width, and seismic standards.

Specific design objectives and potential improvement alternatives are currently being developed through full engineering and environmental analysis. This effort is being undertaken in coordination with the Hawaii State Historic Preservation Division, Native Hawaiian organizations (NHOs), and other interested parties such as the public, local businesses, emergency responders, and relevant governmental and non-governmental agencies. Multiple factors will inform the design process including considerations such as the historic character of the roadway and its bridges, minimization of construction impacts, including impacts to natural and cultural resources as well as traffic and access impacts, design/service life, cost-effectiveness, and consistency with applicable design and safety criteria. Improvement actions may involve rehabilitation or reconstruction of the bridges or individual bridge elements to address structural issues, inadequate load capacity, and safety deficiencies. Due to the lack of available traffic detours, temporary structures may need to be erected adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the Area of Potential Effects (APE) for the project.

Area of Potential Effects

The archaeological and historic architectural Area of Potential Effects (APE) is illustrated in the enclosed figures (Attachment A, Figures 6-11), and includes potential temporary and permanent impact areas. The APE comprises 8.8 acres and includes Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

- Bridge #2, Kailua Stream Bridge (MP 5.9): [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015
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- Bridge #39, Ulaino Stream Bridge (MP 27.9): [2]-1-2-003:001 and 005
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Consultations

Project information and an invitation to share knowledge and/or be a consulting party is being sent to Native Hawaiian organizations (NHOs) and Native Hawaiian descendants that may have ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. Letters for this project are being sent to the following NHOs as well as other organizations with knowledge of cultural, archaeological, and historical resources:

- Aha Moku O Maui, Inc.
- Aha Moku Advisory Committee
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawaii
- Brian Kaniela Naeʻole Naauao
- Council for Native Hawaiian Advancement
- Friends of ʻIolani Palace
- Friends of Mokuʻula, Inc.
- George K. Cypher ʻOhana
- Hawaiian Civic Club of Hilo
- Historic Hawaii Foundation
- Hui Huliau, Inc.
- Kamehameha Schools - Community Relations and Communications Group, Government Relations
- Kanu o ka ʻĀina Learning ʻOhana
- Koʻolau Foundation
- Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
- Maui Lanaʻi Island Burial Council
- Na Aikane O Maui
- Na Koa Ikaika Ka Lahui Hawaii
- Native Hawaiian Economic Alliance
- Nekaifes Ohana
- Office of Hawaiian Affairs
- Order of Kamehameha I
- Papa Ola Lokahi
- Paukukalo Hawaiian Homes Community Association
- The I Mua Group
- The Makua Group

Your knowledge of the area is of great value. We seek your assistance in FHWA and HDOT's efforts to identify historic properties and evaluate the project's potential to affect properties. We welcome any comments you may have on the project's Area of Potential Effects or information you may wish to share. Lastly, if you are aware of any additional person or organization that is knowledgeable or has cultural or religious attachment to the proposed project area, we would appreciate receiving their names and contact information.

A response within 30 days would be appreciated. FHWA-CFLHD will continue to share inventory survey results and additional project information with the Commission as it becomes available for your review and feedback. We very much appreciate your continued engagement to help shape this important project. Please provide written response to me by email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228.

Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3689, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

Enclosures:

- Attachment A: Figures
  - Figure 1, Overview of Bridge Locations
  - Figures 2-5, Topographic Map Overview of Bridge Locations
  - Figures 6-11, Area of Potential Effects Map for each Bridge

cc (via electronic mail):

Dr. Susan Lebo, SHPD
Tanya Gumapac-McGuire, SHPD
Misako Mimura, HDOT
Kevin Ito, HDOT
Andrew Hirano, HDOT
Karen Chun, HDOT
Curtis Matsuda, HDOT
Robin Shishido, HDOT

MICHAEL P. VICTORINO
Mayor

MICHELE CHOUTEAU MCLEAN, AICP
Director

JORDAN E. HART
Deputy Director

DEPARTMENT OF PLANNING
COUNTY OF MAUI
ONE MAIN PLAZA
2200 MAIN STREET, SUITE 315
WAILUKU, MAUI, HAWAII 96793

December 9, 2019

J. Michael Will, P.E.
U.S. Department of Transportation,
Federal Highways Administration,
Central Federal Lands Highway Division
12300 West Dakota Avenue, Suite 380
Lakewood, Colorado 80228

Dear Mr. Will:

RE: NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION WITH THE MAUI COUNTY CULTURAL RESOURCES COMMISSION REGARDING THE HĀNA HIGHWAY BRIDGE IMPROVEMENTS PROJECT, INVOLVING THE FOLLOWING BRIDGES ALONG HĀNA HIGHWAY (ROUTE 360): KAILUA STREAM BRIDGE, MAKANALI STREAM BRIDGE, PUOHOKAMOA STREAM BRIDGE, KOPILIULA STREAM BRIDGE, ULAINO STREAM BRIDGE, AND MOKULEHUA STREAM BRIDGE

At its December 5, 2019 meeting, the Maui County Cultural Resources Commission (Commission) discussed your letter dated October 17, 2019 (HFPM-16) regarding the Hāna Highway Bridge Improvements Project (Project).

With respect to your letter, the Commission offered the following comments and raised the following questions:

1. In November 2015, the State Department of Transportation, Highways Division published a preservation plan (Plan) for State-owned bridges within the Hāna Belt Road Historic District. The Plan is formally titled *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District*. Specific treatments are identified

for each bridge in this Plan. These treatment recommendations were carefully developed by an interdisciplinary team to preserve historic integrity while allowing for safety upgrades. Is the Hāna Highway Bridge Improvements Project taking any recommendations from this Plan into consideration?

2. There are a number of historic features, including culverts, stacked stone retaining walls, and curbing, within the Hāna Belt Road Historic District. Where are these historic features in relation to the proposed Area of Potential Effects? How will equipment go into and out of the staging areas? Will the moving of equipment and materials into and out of the proposed Area of Potential Effects involve the destruction of any of these historic features?

Should you have any questions or require additional clarification, please contact Annalise Kehler, Cultural Resources Planner, at (808) 270-7506.

Sincerely,

MICHELE CHOUTEAU MCLEAN, AICP
Planning Director

xc: J. Michael Will, Federal Highway Administration, michael.will@dot.gov (PDF)
Tanya Gumapac-McGuire, SHPD Architecture Branch, Tanya.Gumapac-McGuire@hawaii.gov (PDF)
Susan Lebo, SHPD Archaeology Branch, susan.a.lebo@hawaii.gov (PDF)
CRC File (K:\WP_DOCS\PLANNING\CRC\2019\Communications to CRC\Section 106 Consultation - Hana Hwy Bridges\APE Consultation)

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U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

January 31, 2020

In Reply Refer To:
HFPM-16

Ms. Tanya Lee-Greig, Chair
Maui County Cultural Resources Commission
c/o Maui County Department of Planning
2200 Main Street
One Main Plaza, Suite 315
Wailuku, HI 96793

Attn: Annalise Kehler

Subject: National Historic Preservation Act, Continued Section 106 Consultation for the Hāna Highway Bridge Improvements Project

Dear Ms. Lee-Greig:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD) is in receipt of a letter dated December 9, 2019 from the Maui County Cultural Resources Commission (Commission) which included questions for our agency. The Commission's letter was developed in response to October 17, 2019 Section 106 correspondence related to the Hāna Highway Bridge Improvements Project. This project, undertaken by FHWA-CFLHD in partnership with the State of Hawaii Department of Transportation (HDOT), seeks to improve six of the historic bridges along Hāna Highway (Route 360), including Kailua Stream Bridge, Makanali Stream Bridge, Puohokamoa Stream Bridge, Kopiliula Stream Bridge, Ulaino Stream Bridge, and Mokulehua Stream Bridge.

FHWA-CFLHD and HDOT greatly appreciate the Commission's time and discussion related to this important project. Included below are responses to the Commission's specific questions presented in the December 2019 correspondence.

Question 1:

In November 2015, the State Department of Transportation, Highways Division published a preservation plan (Plan) for State-owned bridges within the Hana Belt Road Historic District. The Plan is formally titled Preservation Plan Project for State Bridges within the Hana Belt Road Historic District. Specific treatments are identified for each bridge in this Plan. These treatment recommendations were carefully developed by an interdisciplinary team to preserve historic integrity while allowing for safety upgrades. Is the Hana Highway Bridge Improvements Project taking any recommendations from this Plan into consideration?

Response 1:

As correctly stated by the Commission, in 2015 the *Preservation Plan Project for State Bridges within the Hana Belt Road Historic District* (Preservation Plan) was developed for the state-maintained bridges in the Hana Belt Road Historic District. Development of this plan included historical and engineering review, as well as extensive public and agency outreach. The Preservation Plan provides an inventory of the historic bridges, evaluation of each structure's historic significance and integrity, and concept-level engineering recommendations for each structure. Also included in the Preservation Plan were recommendations for additional known studies and/or future considerations.

We are now continuing the efforts of the Preservation Plan and advancing the engineering and environmental analysis for the six bridges included in this project. This includes validating and supplementing site-specific structural analyses, performing additional studies as recommended in the Preservation Plan (for example, Archaeological Inventory Survey, Seismic Analyses, and Hydraulic and Scour Analyses, etc.), and evaluating rehabilitation concepts. The project team is evaluating all Preservation Plan recommendations and analyzing them on their constructability (how it gets built) and how they meet project goals and design criteria. In addition, where new alternative design ideas have been identified that provide opportunities to preserve historic bridge elements or otherwise meet project goals, the project team is also closely analyzing these ideas. Public and stakeholder engagement continues as we seek to refine and advance this project.

Question 2:

There are a number of historic features, including culverts, stacked stone retaining walls, and curbing, within the Hana Belt Road Historic District. Where are these historic features in relation to the proposed Area of Potential Effects? How will equipment go into and out of the staging areas? Will the moving of equipment and materials into and out of the proposed Area of Potential Effects involve the destruction of any of these historic features?

Response 2:

FHWA-CFLHD is currently undertaking an inventory effort to identify all historic properties located within the Area of Potential Effects (APE) that may be affected by the undertaking. The APE includes areas surrounding each of the bridges for potential improvements and temporary traffic control, as well as additional potential temporary staging, stockpiling, and construction access areas. Scientific Consultant Services, Inc. is currently performing this inventory survey in support of the project. Recorded thus far within the APE include a number of historic features. A Draft Archaeological Inventory Survey (AIS) is being developed that will identify these historic features and their location in relation to the APE. This Draft AIS will be provided to the Commission for its review and comment, anticipated in spring 2020. Effects to individual features are currently unknown at this point in the project development process; however, the project team will strive to avoid and minimize impacts to identified historic features to the extent practicable. As the project advances, an Assessment of Effect will be prepared to evaluate impacts to historic properties that will also be shared with the Commission for review.

Again, FHWA-CFLHD greatly appreciates the valuable input the Commission provides to help shape this important project. If there are any additional comments or questions, please do not

hesitate to contact me. It's also our understanding that a project update is included on the agenda for the February 2020 Commission meeting for which we will have a project representative available to answer any further questions and obtain additional feedback.

I can be reached via email at Michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228. Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3473, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely yours,

J. Michael Will, P.E.
Project Manager

cc (via electronic mail):

Dr. Susan Lebo, SHPD
Tanya Gumapac-McGuire, SHPD
Misako Mimura, HDOT
Kevin Ito, HDOT
Andrew Hirano, HDOT
Karen Chun, HDOT
Curtis Matsuda, HDOT
Robin Shishido, HDOT

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380A
Lakewood, CO 80228-2583
Office: 720-963-3647
Fax: 720-963-3596
Michael.Will@dot.gov

September 8, 2020

In Reply Refer To:
HFPM-16

To: Honorable Suzanne Case, Chairperson
Department of Land and Natural Resources

Attn: Suzanne Case
State Historic Preservation Officer

From: J. Michael Will, P.E.
Project Manager

Subject: National Historic Preservation Act, Continued Section 106 Consultation for the Hāna Highway Bridge Improvements (Log No.2019.02196, Doc No. 1911SH023)

Hāmākualoa and Koʻolau Districts, Maui Island, Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu Ahupuaʻa

Tax Map Key: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way

Dear Ms. Case:

The Federal Highway Administration (FHWA) Central Federal Lands Highway Division (CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is proposing a project to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see Attachment A). The proposed project is considered a federal action and undertaking, and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). This letter is to continue consultation with the State Historic Preservation Division (SHPD) under Section 106 in accordance with Title 36 of the *Code of Federal Regulations* (CFR), Section 800.4. The SHPD concurred with FHWA-CFLHD's defined Area of Potential Effects (APE) for the undertaking in a letter dated November 1, 2019 (Log No.2019.02196, Doc No. 1911SH023). The approved APE remains unchanged since your concurrence and is enclosed with this submittal. This letter is to submit for your review the Archaeological Inventory Survey (AIS) and provide eligibility determinations for identified historic properties for your review and concurrence.

Please note that under Hawaii Act 048 (Act 218 extension), which provides temporary exemptions from certain state and county requirements to expedite construction of bridge rehabilitation and replacement projects, this project is exempt from Chapter 6E of the Hawaii Revised Statutes (HRS) regarding historic preservation.

Overview of the Undertaking

The purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The project seeks to address existing sub-standard structural conditions by improving them to be more consistent with current standards and guidelines for load capacity, bridge railing and transitions, and seismic and scour standards.

FHWA-CFLHD, in partnership with HDOT, is currently developing and analyzing engineering solutions to address the structural issues at each of the six bridges. Due to the lack of available traffic detours, temporary structures are likely needed adjacent the existing structures to accommodate traffic during construction activities. Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the APE for the project.

Area of Potential Effects

The archaeological and historic architectural APE is illustrated in the enclosed AIS, and includes potential temporary and permanent impact areas. The APE comprises 8.8 acres and includes Hāna Highway right-of-way and portions of the following Tax Map Keys (TMKs):

- Bridge #2, Kailua Stream Bridge (MP 5.9): [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015
- Bridge #5, Makanali Stream Bridge (MP 8.2): [2] 1-1-001:036 and 042
- Bridge #8, Puohokamoa Stream Bridge (MP 11.0): [2] 1-1-001:022, 023, 044, and 052
- Bridge #19, Kopiliula Stream Bridge (MP 21.7): [2] 1-2-001:003, [2] 1-2-004:005
- Bridge #39, Ulaino Stream Bridge (MP 27.9): [2]-1-2-003:001 and 005
- Bridge #40, Mokulehua Stream Bridge (MP 28.3): [2] 1-2-003:001, 005, [2] 1-3-002:020 and 023
- Additional Potential Staging Areas: [2] 1-2-001:003 and [2] 1-2-004:005

Determination of Eligibility

FHWA-CFLHD has contracted with HDR and its subconsultants, Scientific Consultant Services, Inc. (SCS) and Fung Associates, Inc., to aid in the inventory efforts to identify historic properties that may be affected by the proposed undertaking. The six bridges included in this project are located within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) and have been documented

through past inventory and nomination efforts. The 2015 *Hana Highway, Route 360 Bridge Preservation Plan* (*Preservation Plan*) prepared by Fung Associates, Inc. and Nagamine Okawa Engineers, Inc. identified and described contributing historic structures and character-defining features, and provided relevant historic and cultural site context for the HDOT- maintained portion of the Hāna Belt Road. As part of this documentation effort, an *Archaeological Literature Review for the Hana Highway, Route 360, Bridge Preservation Plan within the Hana Highway Historic District* was also prepared (Appendix 1 of the *Preservation Plan*). The report provides a summary of the cultural historical background and information on existing archaeological conditions, as well as the potential for encountering sensitive sites.

FHWA-CFLHD is in agreement with previous determinations of eligibility. Hāna Belt Road (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) is significant as nominated as a historic district under Criteria A and C for its state and local significance in the areas of engineering, social history, transportation, and commerce. The six bridges to be addressed by this project are significant and contributing structures, with several character-defining features that help convey the historic district's significance. This includes, but is not limited to, such features as bridge types, abutments, railings, approach walls, and integrated portions of the East Maui Irrigation (EMI) system. FHWA-CFLHD is in agreement with the significance and context assessments as described in the *Preservation Plan* for this undertaking's subject bridges (also provided in Appendix B of the enclosed AIS). Please note that Puohokamoa Stream Bridge is listed as a feature of the Hāna Belt Road (SIHP # -01638), but was also assigned its own site number in 1974 (SIHP # -1509).

Supplementary to the above documentation, SCS performed an AIS of the APE identified for this undertaking to improve six historic bridges. The AIS is enclosed with this submittal (Attachment B). Fieldwork led to the identification of one site and multiple features at three bridge locations: Mokulehua Stream Bridge (one site and one feature), Kopili`ula Stream Bridge (5 features), and Puohokamoa Stream Bridge (two features). No features other than the roadway and bridges themselves were identified in the APE at Kailua, Makanali, or Ulaino Stream Bridges. FHWA-CFLHD has determined Temporary Site #1 is eligible for the NRHP under Criterion D. The additional 8 features recorded as part of the AIS appear to be associated with the previously-listed Hāna Belt Road historic district. Therefore, FHWA-CFLHD has determined to treat these features as contributing to the Hāna Belt Road NRHP-listed property.

Consultations

Consultations have been initiated and will continue through the Section 106 process. The public will also be continually engaged throughout project development. Two series of public meetings have been held along the Hāna Highway corridor, in addition to consultation meetings with your office and other consulting parties, including the Maui County Cultural Resources Commission and Historic Hawaii Foundation. These meetings were held in March 2019 and January/February 2020 and are a supplement to extensive community and agency consultation efforts included as part of the overall *Preservation Plan*. Primary interest from the public has been on construction impacts, aesthetics of the bridges, bridge longevity, and maintaining the "feel" of the roadway corridor so as to maintain the unique roadway character and also to not encourage increased development.

Consultation letters were also sent to the following Native Hawaiian organizations and Native Hawaiian descendants that may have ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. These include:

- Aha Moku O Maui, Inc., including Moku O Hana, Hamakualoa, Hamakuapoko, Kahikinui, Kaupo, Koolau, and Kipahulu
- Aha Moku Advisory Committee
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawaii
- Brian Kaniela Naeʻole Naauao
- Council for Native Hawaiian Advancement
- Friends of ʻIolani Palace
- Friends of Mokuʻula, Inc.
- George K. Cypher ʻOhana
- Hawaiian Civic Club of Hilo
- Hui Huliau, Inc.
- Kamehameha Schools - Community Relations and Communications Group, Government Relations
- Kanu o ka ʻĀina Learning ʻOhana
- Koʻolau Foundation
- Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
- Maui Lanaʻi Island Burial Council
- Na Aikane O Maui
- Na Koa Ikaika Ka Lahui Hawaii
- Native Hawaiian Economic Alliance
- Nekaifes Ohana
- Office of Hawaiian Affairs
- Order of Kamehameha I
- Papa Ola Lokahi
- Paukukalo Hawaiian Homes Community Association
- The I Mua Group
- The Makua Group

Responses from Maui Lanaʻi Island Burial Council and Aha Moku o Maui were received that acknowledged receipt of the project correspondence and that information was shared with representatives. No comments have been received.

Request for Concurrence

We request your concurrence with Determinations of Eligibility. We would appreciate a written response within 30 days from date of receipt, by email at michael.will@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380A, Lakewood, CO 80228-2583.

Please feel free to contact Lisa Hemesath, Environmental Protection Specialist, at (720) 963-3473, email: lisa.Hemesath@dot.gov, if you have any questions. We look forward to working with the SHPO on these needed improvements.

Sincerely,

J. Michael Will, P.E.
Project Manager

Enclosures:

- Attachment A: Overview of Bridge Locations
- Attachment B: Archaeological Inventory Survey for the Hāna Highway Bridge Improvement Project

cc (via email with digital enclosures):

Susan Lebo, SHPD
Tanya Gumapac-McGuire, SHPD
Karen Chun, HDOT
Andrew Hirano, HDOT
Misako Mimura, HDOT
Robin Shishido, HDOT

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

October 21, 2021

In Reply Refer To:
HFPM-16

Ms. Brandis Sarich, Chair
Maui County Cultural Resources Commission
c/o Maui County Department of Planning
2200 Main Street
One Main Plaza, Suite 315
Wailuku, HI 96793

Attn: Annalise Kehler

Subject: National Historic Preservation Act, Continued Section 106 Consultation for the Hāna Highway Bridge Improvements Project

Dear Ms. Sarich:

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA-CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is proposing a project to improve six of the historic bridges along Hāna Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (see attached Figure 1). The proposed project is considered a federal action and undertaking and will comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). As part of the continued Section 106 consultation process, FHWA-CFLHD is providing the Maui County Cultural Resources Commission (Commission) with a project update and additional project information for review and comment. This correspondence provides the following:

- Overview of the undertaking, including a summary of the alternatives evaluation process, for your input
- Area of Potential Effects (APE) – The APE remains unchanged from previous correspondence (letter dated October 17, 2019) and is described for informational purposes.
- Description of historic properties, including an accompanying Archaeological Inventory Survey (AIS), for your review and comment
- Summary of consultation efforts for your information and input
- Responses to questions from the Commission sent to FHWA-CFLHD in an email dated September 10, 2021 (generated in a February 2020 Commission meeting)

FHWA-CFLHD can also have project representatives available at a Commission meeting to verbally present project information and answer questions. Please note that historic properties are present within the APE and an Assessment of Effect pursuant to 36 Code of Federal Regulations (CFR) 800.5 is currently being prepared. FHWA-CFLHD will provide this to the Commission for its review and comment in future correspondence.

Overview of the Undertaking

The purpose of the proposed project is to improve the six bridges in a context-sensitive manner so they remain functional for highway users and local and regional communities. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hāna Highway. The six bridges now being studied in more detail for this project have been identified by HDOT as high priority for improvements. The project seeks to address existing sub-standard structural conditions by improving them to meet current standards and guidelines for load capacity, bridge railing and transitions, and seismic and scour standards.

FHWA-CFLHD, in partnership with HDOT, has been developing and analyzing engineering solutions to address the structural and railing safety issues at each of the six bridges. Alternatives have been compared based on the following evaluation criteria:

- Construction and maintenance costs
- Ability to meet the design standards and service life
- Impacts on the environment and right-of-way
- Ability to retain the historic character of the district and bridge
- Constructability and ability to maintain traffic

Attached to this letter correspondence is a presentation recently shared with the public that depicts the alternatives considered and the proposed engineering solution at each of the six bridges. At five of the six bridge locations, Kailua Stream Bridge (Bridge #2), Makanali Stream Bridge (Bridge #5), Puohokomoa Stream Bridge (Bridge #8), Ulaino Stream Bridge (Bridge #39), and Mokulehua Stream Bridge (Bridge #40), the proposed solution is to retain the existing substructure, including the character-defining abutments and piers, and provide a new single-span structure that spans over the existing supports. The concrete superstructures would be designed to best match the existing historic features while also meeting project design criteria. The proposed solution at Kopiliula Stream Bridge (Bridge #19) is to retain the existing bridge in its entirety and construct a new, off-alignment bridge makai of the existing bridge.

Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the APE for the project. The APE also accommodates potential construction techniques for the maintenance of traffic, such as slide-in bridge construction or temporary bypass structures.

Area of Potential Effects (APE)

The archaeological and historic architectural APE is illustrated in the enclosed AIS, and includes potential temporary and permanent impact areas (comprising approximately 8.8 acres). The APE remains unchanged from previous correspondence.

Historic Properties within the APE

FHWA-CFLHD has contracted with HDR and its subconsultants, Scientific Consultant Services, Inc. (SCS) and Fung Associates, Inc., to aid in the inventory efforts to identify historic properties that may be affected by the proposed undertaking. The six bridges included in this project are located within the National Register of Historic Places (NRHP)-listed Hāna Belt Road historic district (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) and have been documented through past inventory and nomination efforts. The 2015 *Hana Highway, Route 360 Bridge Preservation Plan* (*Preservation Plan*) prepared by Fung Associates, Inc. and Nagamine Okawa Engineers, Inc. identified and described contributing historic structures and character-defining features, and provided relevant historic and cultural site context for the HDOT- maintained portion of the Hāna Belt Road. As part of this documentation effort, an *Archaeological Literature Review for the Hana Highway, Route 360, Bridge Preservation Plan within the Hana Highway Historic District* was also prepared (Appendix 1 of the *Preservation Plan*). The report provides a summary of the cultural historical background and information on existing archaeological conditions, as well as the potential for encountering sensitive sites.

FHWA-CFLHD is in agreement with previous determinations of eligibility. Hāna Belt Road (NRHP Reference # 01000615 / SIHP # 50-50-va-01638) is significant as nominated as a historic district under Criteria A and C for its state and local significance in the areas of engineering, social history, transportation, and commerce. The six bridges to be addressed by this project are significant and contributing structures, with several character-defining features that help convey the historic district's significance. This includes, but is not limited to, such features as bridge types, abutments, railings, approach walls, and integrated portions of the East Maui Irrigation (EMI) system. FHWA-CFLHD is in agreement with the significance and context assessments as described in the *Preservation Plan* for this undertaking's subject bridges (also provided in Appendix B of the enclosed AIS). Please note that Puohokamoa Stream Bridge is listed as a feature of the Hāna Belt Road (SIHP # -01638), but was also assigned its own site number in 1974 (SIHP # -1509).

Supplementary to the above documentation and on behalf of FHWA-CFLHD, SCS performed an archaeological inventory survey (AIS) of the APE identified for this undertaking to improve six historic bridges. The AIS is enclosed with this correspondence. Fieldwork led to the identification of one site and multiple features at three bridge locations: Mokulehua Stream Bridge (one site and one feature), Kopiliula Stream Bridge (5 features), and Puohokamoa Stream Bridge (two features). No features other than the roadway and bridges themselves were identified in the APE at Kailua, Makanali, or Ulaino Stream Bridges. FHWA-CFLHD has determined Temporary Site #1 is eligible for the NRHP under Criterion D. The additional 8 features recorded as part of the AIS appear to be associated with the previously-listed Hāna Belt Road historic district. Therefore, FHWA-CFLHD has determined to treat these features as contributing to the Hāna Belt Road NRHP-listed property.

Consultations

Consultations have been initiated and will continue through the Section 106 process. In addition to consulting with the Commission and the Hawaii State Historic Preservation Officer (SHPO), FHWA-CFLHD has also included the Historic Hawaii Foundation as a consulting party to the Section 106 process. The public will also be consistently engaged throughout project development. Three series of public meetings have been held along the Hāna Highway corridor.

In-person meetings were held in March 2019 and January/February 2020 and are a supplement to extensive community and agency consultation efforts included as part of the overall *Preservation Plan*. In addition, a series of virtual meetings were recently held in September 2021 to present the alternatives study results and obtain input. Primary interest from the public in meetings has been on construction impacts, aesthetics of the bridges, bridge longevity, and maintaining the "feel" of the roadway corridor so as to maintain the unique roadway character and also to not encourage increased development.

Consultation letters were also sent to the following Native Hawaiian organizations (NHOs) and Native Hawaiian descendants that may have ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. These include:

- Aha Moku O Maui, Inc., including Moku O Hana, Hamakualoa, Hamakuapoko, Kahikinui, Kaupo, Koolau, and Kipahulu
- Aha Moku Advisory Committee
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawaii
- Brian Kaniela Naeʻole Naauao
- Council for Native Hawaiian Advancement
- Friends of ʻIolani Palace
- Friends of Mokuʻula, Inc.
- George K. Cypher ʻOhana
- Hawaiian Civic Club of Hilo
- Hui Huliau, Inc.
- Kamehameha Schools - Community Relations and Communications Group, Government Relations
- Kanu o ka ʻĀina Learning ʻOhana
- Koʻolau Foundation
- Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
- Maui Lanaʻi Island Burial Council
- Na Aikane O Maui
- Na Koa Ikaika Ka Lahui Hawaii
- Native Hawaiian Economic Alliance
- Nekaifes Ohana
- Office of Hawaiian Affairs
- Order of Kamehameha I
- Papa Ola Lokahi
- Paukukalo Hawaiian Homes Community Association
- The I Mua Group
- The Makua Group

Responses from Maui Lanaʻi Island Burial Council and Aha Moku o Maui were received that acknowledged receipt of the project correspondence and that information was shared with representatives. No comments have been received.

Request for Input

Please share with us any comments you may have on the project and the enclosed AIS. We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area, or other historic or cultural sites about which you may have knowledge. In addition, if you are acquainted with any additional individuals or organizations that are knowledgeable or have cultural or religious attachment to the proposed project area, we would appreciate you sharing their names and contact information.

FHWA-CFLHD will continue consultation as it relates to project design, effect findings, and avoidance, minimization, and mitigation measures to be incorporated into the project. Future correspondence will be forthcoming. We greatly appreciate the valuable input the Commission has been providing in support of this important project.

Please provide comments via email at Tomasz.Kubicz@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228. Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3473, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

Enclosures:

- Figure 1: Overview of Bridge Locations
- Archaeological Inventory Survey for the Hāna Highway Bridge Improvement Project
- September 2021 Virtual Public Meeting Presentation
- Maui County Cultural Resources Commission Questions and FHWA Responses

cc (via electronic mail):

Dr. Susan Lebo, SHPD
Julia Flauaus, SHPD
Stephanie Hacker, SHPD
Andrew Hirano, HDOT
Karen Chun, HDOT
Robin Shishido, HDOT

Maui County Cultural Resource Commission's Questions/FHWA Responses (September 2021 Emailed Questions)

1. *When did the Section 106 consultation process for this project begin?*

Section 106 consultation for this subject undertaking began with official correspondence in October 2019, although early pre-consultation occurred from March 2019.

2. *What other consulting parties are involved in the Section 106 consultation?*

In addition to the Commission, other consulting parties for this undertaking include the Hawaii State Historic Preservation Officer (SHPO) and the Historic Hawaii Foundation.

3. *What were the general public comments that came from the meetings that were held in January of 2020? Was there anything that was of most concern to the community?*

Below are the primary themes or comments received at the January 2020 meetings.

- Traffic impacts
    - Every community had concerns about roadway closures. Daytime closures would impact tourists, thereby impacting the local economy, as well as residents commuting to and from school, jobs, and commercial areas. Night-time closures should be timed so that people who commute along Hana Highway at early morning and late evening hours can be accommodated. Emergency services require passage throughout the corridor. Daytime delays should be kept to a minimum.
- Aesthetics
    - A preference for an eye-pleasing design was stated by many people, with a solution that best matched the existing roadway and bridges.
    - There was a strong negative reaction to the double railing concept, except for one community member who preferred it for its ability to preserve the historic rails. Negative feedback was on aesthetics, as well as safety and maintenance concerns.
- Reliability/Durability
    - Community members want a long-lasting solution. They see the challenges of maintaining the roadway, so they want a fix that lasts and provides reliability for future generations.
- Natural Resources
    - The streams are important to community members, especially since many of them are flowing more regularly as a result of reduced EMI water diversions. Minimize impacts to streams and aquatic resources.
    - Minimize tree removal.
- Development
    - The further east along Hana Highway the more common this refrain was – a solution should not allow for increased development potential. The feedback focused primarily on load rating of bridges, with limited additional input on minimizing any bridge widening.

Virtual meetings were also held in late September 2021. We have enclosed a copy of the presentation that was provided to the public. Similar themes and/or comments were received at the September 2021 virtual meetings. Traffic impacts and construction duration were a top interest of the public, with input and questions regarding bridge design life, natural resource impacts, and aesthetics also provided. With respect to aesthetics, positive feedback on the proposed solutions was received. A couple commenters noted the "new" appearance of the concrete in the visual renderings.

4. *What percentage of each bridge is projected to be demolished, reconstructed, or rehabilitated? To give a sense of what percentage of each bridge will be affected by the project?*

Exhibits shown on pages 15 through 33 of the enclosed PowerPoint presentation depict the anticipated percentages of each bridge to be retained, altered, or replaced under the evaluated alternatives. Shown in green (% retained) represents what can remain without alteration or concealment; shown in blue (% altered) represents what would be altered and/or fully concealed; and shown in orange (% replaced) represents what would need to be replaced.

5. *Has HDOT done surveys of how many cars use the road each day? How many daily users will be affected by construction (based on the survey data)?*

Based on the latest traffic data collected by HDOT, the average daily traffic volume is 1,900 vehicles per day.

6. *When is construction anticipated to start?*

Construction is anticipated to start in the spring of 2023.

7. *What is the anticipated duration of construction?*

The anticipated duration of construction for each bridge is approximately one year. It is possible for multiple bridges to be constructed concurrently, but a specific construction delivery strategy is not yet known. This will be developed as design advances and a construction schedule is developed.

8. *Are there any historic documents/blueprints/plans for the original bridges? These might help us understand why particular design elements were chosen and why they're important to carry forward.*

For five of the six bridges to be improved, existing plans or "as-built" drawings do not exist. For Bridge #19, Kopiliula Stream Bridge, one single existing bridge design sheet was available. Historic studies/documents for this project include the 2001 National Park Service (NPS) nomination form for the Hana Belt Road, Historic American Engineering Record (HAER) that was completed for the Hana Belt Road historic district (HI-75), and the supplemental inventory effort of the 2015 Preservation Plan which described character-defining features for each of the individual bridges. The completed HAER HI-75 includes a historical narrative, written descriptions of each of the bridges, large-format photographs, and drawings of representative bridge types, typical cross-sections, and representative bridge parapets and roadside edging. Of the six bridges in this project, included in the HAER HI-75 drawing set are drawings of Makanali Stream Bridge and the parapets of Kailua Stream Bridge.

FHWA-CFLHD's consultants have performed land and topographic survey of the key visible features of the existing bridges. This includes documentation of existing bridge geometry, geometric features, and other physical features of the bridges through the use of traditional survey and measurement techniques, as well as supplemental LiDAR scans of the existing bridges.

9. *For the most unique, or longer bridges, can the majority of those be retained rather than demolished and rebuilt?*

For five of the six bridges, including Kailua Stream Bridge (#2), Makanali Stream Bridge (#5), Puohokomoa Stream Bridge (#8), Ulaino Stream Bridge (#39), and Mokulehua Stream Bridge (#40), the level of rehabilitation needed to address structural issues would require substructural elements to be rehabilitated or fully replaced, depending on the structure, while superstructure elements would also need to be concealed, altered, or replaced. This alternative would also involve higher costs, a shorter design life, longer construction impacts, and higher risks. Therefore, for these bridges, FHWA-CFLHD and HDOT propose to retain the existing substructure elements, including the character-defining abutments and piers, and provide a new superstructure that spans over existing supports.

For Kopiliula Stream Bridge (#19), it is proposed to retain the existing bridge in its entirety and build a new, off-alignment bridge.

10. *For the portions that will be retained, will they need to be reinforced?*

For five of the six bridges, FHWA-CFLHD and HDOT propose to retain the existing character-defining abutments and piers by spanning over them with a new superstructure. The new superstructures will be supported on new abutments built behind and concealed behind the existing. Reinforcement will not be necessary from a structural capacity perspective of the new bridge. The features will be protected in place during construction. A question has been recently brought forward by the Historic Hawaii Foundation on future treatment/management of the abutments and piers, and the project team will be discussing this further with HDOT.

For Kopiliula Stream Bridge (#19), it is proposed to retain the existing bridge in its entirety and build a new, off-alignment bridge. Future treatment of the existing bridge is not yet known and needs to be further explored. It is thought that public access would be restricted due to structural and safety concerns, but access for maintenance of the East Maui Irrigation system would likely need to be provided. We appreciate any input the Commission may wish to share on this matter.

MICHAEL P. VICTORINO
Mayor

MICHELE CHOUTEAU MCLEAN, AICP
Director

JORDAN E. HART
Deputy Director

DEPARTMENT OF PLANNING
COUNTY OF MAUI
ONE MAIN PLAZA
2200 MAIN STREET, SUITE 315
WAILUKU, MAUI, HAWAII 96793

January 13, 2022

Tomasz Kubicz, P.E., Project Manager
U.S. Department of Transportation
Federal Highways Administration
Central Federal Lands Highway Division
12300 West Dakota Avenue Suite 380
Lakewood, CO 80228

Dear Mr. Kubicz:

RE: COMMENTS FROM THE MAUI COUNTY CULTURAL RESOURCES COMMISSION ON THE PROPOSED HĀNA HIGHWAY BRIDGE IMPROVEMENT PROJECT, INVOLVING THE FOLLOWING BRIDGES WITHIN THE HĀNA BELT ROAD HISTORIC DISTRICT: KAILUA, MAKANALI, PUOHOKAMOA, KŌPILI'ULA, 'ULA'INO, AND MOKULEHUA

At its January 6, 2022 meeting, the Maui County Cultural Resources Commission (Commission) voted to transmit the following comments and questions:

1. The testimony provided by Ke'eaumoku Kapu at the January 6, 2022 meeting should be addressed and incorporated into the overall project. This includes making sure that 'Aha Moku o Maui is included in the Section 106 consultation. They should also be included as a participant or signatory in the MOA process. For the moku (traditional land division or district) of Hāna, the contact is Sam Akoi. Correspondence can be sent to the CEO of 'Aha Moku o Maui, Ke'eaumoku Kapu and he can send it out to the applicable representatives. It is important to include them ('Aha Moku o Maui) as Hāna has been known to have burials along the corridor.
2. Have lineal descendants from the project area been consulted about this project? If so, how many? Please provide the Commission with their names. It would be helpful to create a list of culturally connected families from the area.
3. If the superstructures of these bridges must be replaced, how can the replacements respect the detailing of the originals? The proposed replacement railings do not have any aesthetic consideration. They look really flat and do not carry over many of the details found on the original railings. There are superficial details that should be easily added to the new railings.

4. Are there exemptions or exceptions for historic bridges? It seems like the road is driven so slowly that some of the modern bridge standards should not apply here.
5. Please provide the Commission with detailed drawings of the proposed replacement components, demonstrating how they will match the originals.
6. Will this project involve development of a maintenance plan for the bridges since inadequate maintenance contributed to their current, poor condition?
7. The comments provided by the County Archaeologist at the January 6, 2022 meeting should be addressed and incorporated into the overall project. This includes exploring whether original details can be incorporated into any new construction, and whether alternatives can be explored that prevent historic bridge components from ending up in the landfill.
8. The comments provided in the November 4, 2021 staff report (see attached) should be addressed and incorporated into the overall project.
9. The comments provided by Department of Planning staff at the January 6, 2022 meeting in response to the Central Federal Lands Highway Division's November 18, 2021 letter (see attached) should be addressed and incorporated into the overall project. This includes:
    a. In general, the project needs more meaningful consultation with descendants of the project area. Please consult with descendants (including lineal and cultural descendants/those with genealogical or generational ties to the project area) on the project as well as the following statement on page 9 of the November 18, 2021 letter: "SCS does not believe there is high archaeological potential for significant subsurface cultural deposits to occur within the APE."
    b. Poor maintenance has contributed to the urgent status of the subject bridges. Vegetation and other biological growth have been allowed to accumulate on and near the bridges, which can accelerate deterioration of historic materials. Layers and layers of asphalt, which is very heavy, have been allowed to build up on the bridges. Unregulated numbers of rental cars and tour vans have been allowed to traverse the bridges without any consideration of how that amount of traffic might be affecting their structural integrity.
    c. Many of the bridges in the Hāna Belt Road Historic District were designed by Chinese engineers and their construction involved Kanaka ʻŌiwi (Native Hawaiian) contractors and prison labor. The bridges are associated with important groups of Hawaiʻi's population. This is part of what makes them so significant.
    d. If the superstructures must be replaced because there is no possible way to rehabilitate them, their components must match the originals as closely as possible. Using pre-tested railings from other communities is not appropriate if they do not incorporate enough of the original details.
    e. Several reasons provided at the November 4, 2021 meeting for not retaining the original superstructures and installing crash-tested railings in select locations seem inadequate. Concerns regarding debris getting trapped between the new railings and parapets can be addressed by performing routine maintenance. Concerns about people crawling on the railings seem strange since tourists and

others currently crawl, sit, and climb on the existing parapets of these bridges. How would replacing the whole superstructures of these bridges prevent this from happening in the future?

Should you have any questions or require additional clarification, please contact Annalise Kehler, Cultural Resources Planner, at (808) 270-7506 or email annalise.kehler@mauicounty.gov.

Sincerely,

MICHELE CHOUTEAU MCLEAN, AICP
Planning Director

xc: Tomasz Kubicz, P.E., U.S. DOT, FHWA, CFLHD, tomasz.kubicz@dot.gov (PDF)
Stephanie Hacker, State Historic Preservation Division, stephanie.hacker@hawaii.gov (PDF)
Andrew McCallister, State Historic Preservation Division, andrew.mccallister@hawaii.gov (PDF)
Janet Six, County Department of Management (PDF)

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U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380
Lakewood, CO 80228
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

February 14, 2022

In Reply Refer To:
HFPM-16

Ms. Brandis Sarich, Chair
Maui County Cultural Resources Commission
c/o Maui County Department of Planning
One Main Plaza
2200 Main Street, Suite 315
Wailuku, HI 96793

Attn: Annalise Kehler

Subject: National Historic Preservation Act, Continued Section 106 Consultation for the Hāna Highway Bridge Improvements Project (Response to Letter dated January 13, 2022)

Dear Ms. Sarich:

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA-CFLHD) is in receipt of a letter dated January 13, 2022 from the Maui County Cultural Resources Commission (Commission) which included questions and comments for our agency. The Commission's letter was developed in response to October 2021 consultation correspondence from FHWA-CFLHD to the Commission, as well as related discussions held during the November 2021 and January 2022 meetings. FHWA-CFLHD also provided specific responses and answers to the November 4, 2021 staff report through correspondence dated November 18, 2021.

FHWA-CFLHD and HDOT greatly appreciate the Commission's time and discussion related to this important project. Included below are responses to the Commission's specific questions presented in the January 2022 correspondence. While minimal additional information is available at this time, input and comments will be considered and evaluated for incorporation into the project. Future submittals to the Commission will provide supplemental information and updates as project evaluation and design progresses.

Question/Comment 1:

The testimony provided by Ke'eaumoku Kapu at the January 6, 2022 meeting should be addressed and incorporated into the overall project. This includes making sure that 'Aha Moku o Maui is included in the Section 106 consultation. They should also be included as a participant or signatory in the MOA process. For the moku (traditional land division or district) of Hana, the contact is Sam Akoi. Correspondence can be sent to the CEO of 'Aha Moku o Maui, Ke'eaumoku Kapu and he can send it out to the applicable representatives. It is important to include them (' Aha Moku o Maui) as Hana has been known to have burials along the corridor.

FHWA Response 1:

FHWA-CFLHD previously sent Section 106 consultation letters through postal mail as well as email to Aha Moku o Maui in October 2019, including Mr. Ke'eaumoku Kapu and representatives from the following moku: Hana, Hamakualoa, Hamakuapoko, Kahikinui, Kaupo, Koolau, and Kipahulu. FHWA-CFLHD did not receive a request to participate as a Section 106 consulting party. With consideration of Mr. Kapu's comments verbally shared at the January 6, 2022 meeting, our agency will re-engage the Aha Moku o Maui directly and determine their appropriate desired role in the consultation process.

Question/Comment 2:

Have lineal descendants from the project area been consulted about this project? If so, how many? Please provide the Commission with their names. It would be helpful to create a list of culturally connected families from the area.

FHWA Response 2:

Enclosed with this letter is a list of individuals and organizations that have been consulted regarding this project.

Question/Comment 3:

If the superstructures of these bridges must be replaced, how can the replacements respect the detailing of the originals? The proposed replacement railings do not have any aesthetic consideration. They look really flat and do not carry over many of the details found on the original railings. There are superficial details that should be easily added to the new railings.

FHWA Response 3:

Thank you for your input related to the aesthetics of the proposed replacement superstructures and railings. As the design of the superstructures and railings is further developed, we will share these details with the Commission for your review and comment.

Question/Comment 4:

Are there exemptions or exceptions for historic bridges? It seems like the road is driven so slowly that some of the modern bridge standards should not apply here.

FHWA Response 4:

Design criteria for these structure improvements referenced many sources and carefully considered the project's historic designation as well as safety and tort into their development. Several design exceptions are anticipated to be applied for this project. These include:

- Design Speed
- Traveled Way Width
- Shoulder Width

- Horizontal Curvature
- Superelevation
- Bridge Width
- Some site-specific hydraulic criteria

Question/Comment 5:

Please provide the Commission with detailed drawings of the proposed replacement components, demonstrating how they will match the originals.

FHWA Response 5:

As the bridge details are further developed, we will provide detailed drawings to the Commission for your review and comment.

Question/Comment 6:

Will this project involve development of a maintenance plan for the bridges since inadequate maintenance contributed to their current, poor condition?

FHWA Response 6:

We appreciate this question and input. FHWA-CFLHD and HDOT will continue coordination on this matter. The structures will be incorporated into HDOT's asset database and management plan. Bridges are inspected every two years to assess their condition and identify items for maintenance in accordance with Federal requirements.

Question/Comment 7:

The comments provided by the County Archaeologist at the January 6, 2022 meeting should be addressed and incorporated into the overall project. This includes exploring whether original details can be incorporated into any new construction, and whether alternatives can be explored that prevent historic bridge components from ending up in the landfill.

FHWA Response 7:

Comments and ideas provided by the County Archaeologist will be explored for incorporation into the project as design progresses.

Question/Comment 8:

The comments provided in the November 4, 2021 staff report (see attached) should be addressed and incorporated into the overall project.

FHWA Response 8:

FHWA-CFLHD is in receipt of the referenced staff report. Responses to questions in the staff report were previously provided in correspondence dated November 18, 2021 and were also discussed at the January 6, 2022 Commission meeting. Commission comments and input received

by FHWA-CFLHD thus far will be evaluated for incorporation into the project. As project evaluation and design progresses, additional information will be shared with the Commission for review and comment.

Question/Comment 9:

The comments provided by Department of Planning staff at the January 6, 2022 meeting in response to the Central Federal Lands Highway Division's November 18, 2021 letter (see attached) should be addressed and incorporated into the overall project. This includes:

a. *In general, the project needs more meaningful consultation with descendants of the project area. Please consult with descendants (including lineal and cultural descendants/those with genealogical or generational ties to the project area) on the project as well as the following statement on page 9 of the November 18, 2021 letter: "SCS does not believe there is high archaeological potential for significant subsurface cultural deposits to occur within the APE."*

b. *Poor maintenance has contributed to the urgent status of the subject bridges. Vegetation and other biological growth have been allowed to accumulate on and near the bridges, which can accelerate deterioration of historic materials. Layers and layers of asphalt, which is very heavy, have been allowed to build up on the bridges. Unregulated numbers of rental cars and tour vans have been allowed to traverse the bridges without any consideration of how that amount of traffic might be affecting their structural integrity.*

c. *Many of the bridges in the Hana Belt Road Historic District were designed by Chinese engineers and their construction involved Kanaka 'Oiwi (Native Hawaiian) contractors and prison labor. The bridges are associated with important groups of Hawai'i's population. This is part of what makes them so significant.*

d. *If the superstructures must be replaced because there is no possible way to rehabilitate them, their components must match the originals as closely as possible. Using pre-tested railings from other communities is not appropriate if they do not incorporate enough of the original details.*

e. *Several reasons provided at the November 4, 2021 meeting for not retaining the original superstructures and installing crash-tested railings in select locations seem inadequate. Concerns regarding debris getting trapped between the new railings and parapets can be addressed by performing routine maintenance. Concerns about people crawling on the railings seem strange since tourists and others currently crawl, sit, and climb on the existing parapets of these bridges. How would replacing the whole superstructures of these bridges prevent this from happening in the future?*

FHWA Response 9:

a. Please see the enclosed list of consulted individuals and organizations. FHWA-CFLHD will re-engage with the Aha Moku o Maui. Future updates on consultation will be provided to the Commission.

b. FHWA-CFLHD and HDOT will continue coordination on maintenance considerations. The structures will be incorporated into HDOT's asset database and management plan. Bridges are inspected every two years to assess their condition and identify items for maintenance in accordance with Federal requirements.

c. Thank you for your input on historic significance. The project team will continue to take the bridges' significance into full consideration with respect to project development efforts and agency decision-making.

d. As the bridge details are further developed, we will provide detailed drawings to the Commission for your review and comment.

e. Each alternative was evaluated against the project's purpose and need and evaluation criteria, and the recommended solutions best met the established criteria. For clarification, the elements listed in comment 9e were not major influencing factors in the evaluation process but were comments that the public expressed when providing input on the modern rail inside the historic rail concept. The public was not in favor of this approach.

Conclusion

FHWA-CFLHD looks forward to continued consultation as it relates to project design, detailing, effect findings, and project avoidance, minimization, and mitigation measures. We greatly appreciate the valuable input the Commission has been providing in support of this important project. If there are any additional questions, please do not hesitate to contact me.

I can be reached via email at Tomasz.Kubicz@dot.gov or by US Postal Service to 12300 West Dakota Avenue, Suite 380, Lakewood, CO 80228. Please also feel free to contact Lisa Hemesath, Environmental Protection Specialist, by telephone at (720) 963-3473, or email Lisa.Hemesath@dot.gov, if you have any questions.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

Enclosure:

Enclosure 1: Hāna Highway Bridge Improvements Project Consulted Individuals and Organizations (dated February 8, 2022)

cc (via electronic mail):

SHPD: Dr. Susan Lebo, Julia Flauaus, Stephanie Hacker
HDOT: Andrew Hirano, Karen Chun, Robin Shishido

Enclosure 1: Hāna Highway Bridge Improvements Project
Consulted Individuals and Organizations (dated February 8, 2022)

Consultations have occurred and/or are ongoing with agencies and organizations with an interest in preservation of historic properties, including Historic Hawaii Foundation, National Trust for Historic Preservation, Maui County Cultural Resources Commission, and the Hawaii State Historic Preservation Division. The Advisory Council on Historic Preservation will also be invited into the Section 106 process pursuant to 36 Code of Federal Regulations (CFR) 800.6(1). Extensive engagement with the public and local communities has also occurred through various online and in-person meetings.

Consultation letters were sent to the following Native Hawaiian organizations and Native Hawaiian descendants that may have ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. These include:

1. Aha Moku O Maui, Inc., including Moku O Hāna, Hāmākualoa, Hāmākuapoko, Kahikinui, Kaupō, Koʻolau, and Kipahulu
2. Aha Moku Advisory Committee
3. Association of Hawaiian Civic Clubs
4. Association of Hawaiians for Homestead Lands
5. Au Puni O Hawaii
6. Brian Kaniela Naeʻole Naauao
7. Council for Native Hawaiian Advancement
8. Friends of ʻIolani Palace
9. Friends of Mokuʻula, Inc.
10. George K. Cypher ʻOhana
11. Hawaiian Civic Club of Hilo
12. Hui Huliau, Inc.
13. Kamehameha Schools - Community Relations and Communications Group, Government Relations
14. Kanu o ka ʻĀina Learning ʻOhana
15. Koʻolau Foundation
16. Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
17. Maui Lanaʻi Island Burial Council
18. Na Aikane O Maui
19. Na Koa Ikaika Ka Lahui Hawaii
20. Native Hawaiian Economic Alliance

21. Nekaifes Ohana
22. Office of Hawaiian Affairs
23. Order of Kamehameha I
24. Papa Ola Lokahi
25. Paukukalo Hawaiian Homes Community Association
26. The I Mua Group
27. The Makua Group

Scientific Consultant Services (SCS), on behalf of FHWA-CFLHD, has done additional outreach to an extensive list of persons who may be knowledgeable about cultural resources or traditional cultural activities in the project vicinity. Notice was also published in the September 2020 issue of the Office of Hawaiian Affairs newsletter, Ka Wai Ola, seeking information on cultural resources and traditional cultural activities in the vicinity of the six historic bridges along Hāna Highway. Information pertaining to cultural resources and traditional cultural practices conducted within the project area or within the ahupuaʻa of Puʻuomāile, Pāpaʻaea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, and Makapuʻu, located in the Districts of Makawao (Hāmākualoa) and Hāna (Koʻolau and Hāna), Island of Maui, Hawaiʻi, was sought from the following fifty-eight (58) individuals and organizations:

1. Brian Kaniela Naeʻole, descendant
2. Thelma Shimaoka, Community Outreach Coordinator III, Office of Hawaiian Affairs
3. Roy Newton, Office of Hawaiian Affairs
4. Albert Perez, Executive Director, Maui Tomorrow Foundation
5. Maui Sierra Club
6. Patty Nishiyama, Nā Kupuna O Maui
7. Kamika Kepa`a, Native Hawaiian Preservation Council
8. Mr. William Hoʻohuli, community member
9. Kai Markell, Compliance Manager, Office of Hawaiian Affairs
10. Bob Hobdy, Environmental Consultant
11. Torrie Nohara, Na Ala Hele Program, Department of Land and Natural Resources Division of Forestry and Wildlife
12. Keʻeaumoku Kapu, CEO, Aha Moku O Maui, Inc.
13. Leimana DaMate, Executive Director, Aha Moku Advisory Committee, State of Hawaii,
14. Chris (Ikaika) Nakahashi, Cultural Historian, State Historic Preservation Division
15. Andrew (Kealana) Phillips, Burial Sites Specialist, State Historic Preservation Division

16. Kumu Hōkūlani Holt, Director, Ka Hikina O Ka Lā, Hawai‘i Papa o Ke Ao, University of Hawaii Maui College
17. Lucienne de Naie, President, Maui Tomorrow Foundation
18. Kumu Kī‘ope Raymond, Formerly of Hawaiian Studies Program, Department of Humanities, University of Hawaii, Maui College
19. Dr. Scott Fisher, Associate Executive Director of Conservation, Hawaii Island Land Trust
20. Dr. Kaleikoa Ka‘eo, Hawaiian Studies Program, Department of Humanities, University of Hawaii, Maui College
21. Tammy Luat-Hueu, community member
22. Dawn Lono, Executive Assistant, Councilmember Shane Sinenci, Hāna District Representative, Maui County Council
23. Shane Sinenci, Hāna District Representative, Aha Moku o Maui and Hāna District Representative, Maui County Council
24. Kyle Nakanelua, Maui Po‘o- Moku O Kahekili, Aha Moku Advisory Council
25. Blossom Feteira, Maui Mokupuni Council
26. Kapulani Antonio, Former Chairperson, Maui/ Lāna‘i Island Burial Council
27. Dane Maxwell, Chairperson, Maui/ Lāna‘i Island Burial Council
28. Annella Amaral, President, Association of Hawaiian Civic Clubs
29. Scott Crawford, Chairperson, Ke Ao Hali‘i and community member
30. Manuel Kululoio, descendant
31. Leinaala Vedder, descendant
32. Mahealani Wendt, Na Moku Aupuni O Ko‘olau Hui
33. Robert Hill, Archaeologist
34. John Blumer-Buell, community member, former member of the Hana Advisory Committee
35. Christel Blumer-Buell , community member
36. Moke Bergau, community member
37. Loly Soler-Bergau, community member
38. Terry Kristiansen , community member
39. Teresa Allred, community member
40. Bruce Stoner, community member
41. Jeffrey C. Paisner, community member
42. Irene Pavao, community member

43. Ellen Kahookele, community member
44. Sharon Kahookele, community member
45. Jean Mary Kahookele, community member
46. Brad (last name unknown), community member
47. Russell Stoner, community member
48. Russell Kahookele, community member
49. Anna Dickison , community member
50. Mapu Kekahuna, Kumu Kamalu, Nahiku Community Association
51. Ashley K. Obrey, Hawai‘i Island Attorney, Native Hawaiian Legal Corporation
52. Mahealani Cypher, descendant
53. Dr. Ward Mardfin, community member
54. Kau‘i Kanaka‘ole, Executive Director, Ala Kukui Hāna Retreat, and community member
55. Harolen Kaiwi, community member
56. Ipo Mailou, community member
57. Josalind Akoi, community member, Hāna District member of Aha Moku o Maui
58. Sam Akoi, descendant

U.S. Department of Transportation
Federal Highway Administration

Central Federal Lands Highway Division

12300 West Dakota Avenue
Suite 380A
Lakewood, CO 80228-2583
Office: 720-963-3498
Fax: 720-963-3596
Tomasz.Kubicz@dot.gov

September 6, 2023

In Reply Refer To:
HFPM-16

Chairperson and State Historic Preservation Officer
Hawaii Department of Land and Natural Resources
Kakuhihewa Building
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707
via HICRIS (https://shpd.hawaii.gov/hicris)

Attention: Alan S. Downer, Ph.D., Deputy State Historic Preservation Officer

Subject: National Historic Preservation Act Section 106 Continued Consultation and Effect Determination & Hawaii Revised Statutes Chapter 6E-8 Review
Hana Highway Bridge Improvements Project (HICRIS Project No. 2020PR34174)
Puʻuomāile and Pāpaʻaʻea, East Makaīwa, Kōlea, Loiloa, Kaliae, Kekuapawela, ʻUlaʻino, And Makapuʻu Ahupuaʻa, Hāmākualoa And Koʻolau Districts, Island of Maui
Project No. HI STP 360(1)
Tax Map Keys: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hana Highway Right-of-Way

Dear Dr. Downer:

The Federal Highway Administration, Central Federal Lands Highway Division (FHWA-CFLHD), in partnership with the State of Hawaii Department of Transportation (HDOT), is proposing a project to improve six of the historic bridges along Hana Highway (Route 360) on the island of Maui. The bridges include Kailua Stream Bridge (Mile Post [MP] 5.9), Makanali Stream Bridge (MP 8.2), Puohokamoa Stream Bridge (MP 11.0), Kopiliula Stream Bridge (MP 21.7), Ulaino Stream Bridge (MP 27.9), and Mokulehua Stream Bridge (MP 28.3) (Figure 1).

The proposed federally funded project is considered a federal action and an undertaking that requires compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. 306108). The project is also subject to review in accordance with Hawaii Revised Statutes (HRS), Chapter 6E-8. Please note that previous project correspondence described the project as temporarily exempt from Chapter 6E of the HRS. However, Hawaii Act 048 (Act 218 extension) has since expired, and the exemption no longer applies to this project.

This letter is to continue consultation with the State Historic Preservation Division (SHPD) under Section 106 in accordance with Title 36 of the Code of Federal Regulations (CFR), Section 800.5, and to submit the subject project for review in accordance with HRS, Chapter 6E-8. The work will occur within the boundary of the Hana Belt Road historic district (NRHP No. 01000615/SIHP No. 50-50-VA-01638) of which the six bridges are contributing resources.

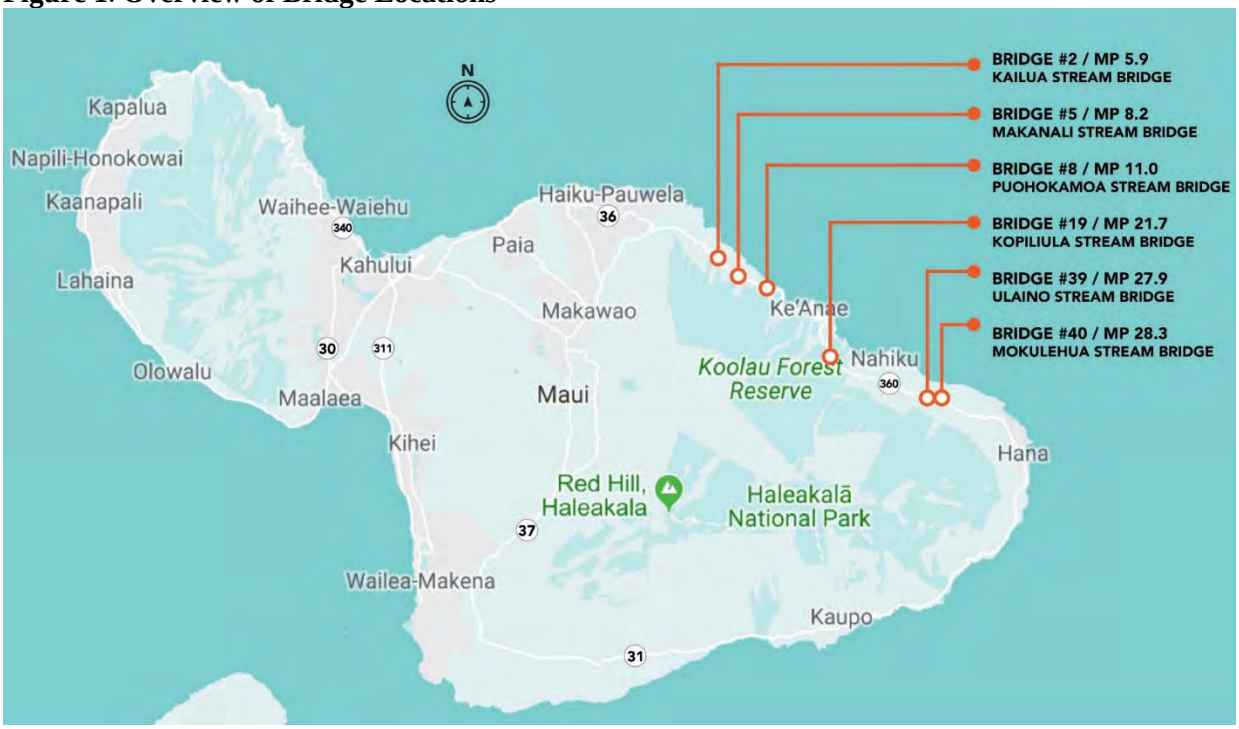
Overview of the Undertaking

FHWA-CFLHD and HDOT propose to address existing structural deterioration and sub-standard structural conditions by improving the six bridges to be consistent with current standards and guidelines for load capacity, bridge railing and transitions, and seismic and scour standards. Overarching goals for the project were developed through an earlier planning process for all state-maintained bridges along Hana Highway. The six bridges being addressed by this project were identified by HDOT as high priority for improvements. Specific treatments at each of the bridges being proposed as part of this undertaking were developed and refined through a supplementary alternative analysis process conducted in consultation with the public and consulting parties.

The project would improve the six bridges in a context-sensitive manner so they remain functional for highway users of local and regional communities. The proposed structural improvements are generally similar at five of the six bridges. That is, at Kailua Stream Bridge (Bridge #2), Makanali Stream Bridge (Bridge #5), Puohokomoa Stream Bridge (Bridge #8), Ulaino Stream Bridge (Bridge #39), and Mokulehua Stream Bridge (Bridge #40), the proposed solution is to preserve the existing substructural elements, including the character-defining abutments and piers, and provide a new one-lane, single-span structure that spans over the existing supports. The concrete superstructures would be designed to best match the existing historic features while also meeting project design criteria. The superstructures would be supported on foundations built behind the existing preserved abutments. The proposed solution at Kopiliula Stream Bridge (Bridge #19) is to preserve the existing bridge in its entirety and construct a new, off-alignment bridge *makai* (towards the sea) of the existing bridge.

Staging and stockpiling of materials is anticipated at each of the bridge locations. Due to the narrow nature of the roadway, additional potential temporary staging and stockpile locations near the project bridges have also been identified. These have been included in the Area of Potential Effects (APE) for the project. The APE also accommodates potential construction techniques for the maintenance of traffic, such as slide-in bridge construction or temporary bypass structures. The approved APE for the undertaking is approximately 8.8 acres, distributed among the six bridge sites and identified potential staging areas (see Attachment A).

Figure 1. Overview of Bridge Locations



Consultation Summary

Consultation has been ongoing throughout project development to encourage cooperation and collaboration between agencies for compliance with both Section 106 of the NHPA and HRS Chapter 6E. Consultation has included the following agencies and stakeholders:

- State of Hawaii Historic Preservation Division (SHPD)
- Native Hawaiian Organizations (NHOs)(listed below)
- Historic Hawaii Foundation (HHF)
- Maui County Culture Resources Commission (MCCRC)
- National Trust for Historic Preservation (NTHP)

In-person meetings were held in March 2019 and January/February 2020 and are supplemental to extensive community and agency consultation efforts included as part of the overall Preservation Plan. In addition, a series of virtual meetings were held in September 2021 to present the alternatives study results and obtain input from the community. Primary interest from the public in meetings has been on construction impacts, aesthetics of the bridges, bridge longevity, and maintaining the "feel" of the roadway corridor to maintain the unique roadway character of Hana Highway. The public also expressed interest in limiting the potential for increased development.

Consultation letters were sent to the following Native Hawaiian Organizations (NHOs) and Native Hawaiian descendants that may have ancestral, lineal, and/or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area (see Attachment B). These include:

- Aha Moku O Maui, Inc., including Moku O Hana, Hamakualoa, Hamakuapoko, Kahikinui, Kaupo, Koolau, and Kipahulu
- Aha Moku Advisory Committee
- Association of Hawaiian Civic Clubs
- Association of Hawaiians for Homestead Lands
- Au Puni O Hawaii
- Brian Kaniela Naeʻole Naauao
- Council for Native Hawaiian Advancement
- Friends of ʻIolani Palace
- Friends of Mokuʻula, Inc.
- George K. Cypher ʻOhana
- Hawaiian Civic Club of Hilo
- Hui Huliau, Inc.
- Kamehameha Schools - Community Relations and Communications Group, Government Relations
- Kanu o ka ʻĀina Learning ʻOhana
- Koʻolau Foundation
- Kululoiʻa Lineage - I ke Kai ʻo Kululoiʻa
- Maui Lanaʻi Island Burial Council
- Na Aikane O Maui
- Na Koa Ikaika Ka Lahui Hawaii
- Native Hawaiian Economic Alliance
- Nekaifes Ohana
- Office of Hawaiian Affairs
- Order of Kamehameha I
- Papa Ola Lokahi
- Paukukalo Hawaiian Homes Community Association
- The I Mua Group
- The Makua Group

Responses from Maui Lanaʻi Island Burial Council and ʻAha Moku O Maui were received that acknowledged receipt of the project correspondence and that information was shared with representatives of their organizations. No further comments have been received.

SHPD concurred with FHWA-CFLHD's defined APE for the undertaking in a letter dated November 1, 2019 (Log No.2019.02196, Doc No. 1911SH023). The approved APE remains unchanged since your concurrence and is enclosed with this submittal as Attachment A. The FHWA-CFLHD continued consultation in correspondence dated September 8, 2020 submitted to SHPD with a draft archaeological inventory survey (AIS) of the APE. The draft AIS identified multiple features associated with three of the six bridges in the APE plus a former residence foundation (temporary site number TS-1) and the East Maui Irrigation (EMI) System (SIHP 50-50-12-01508). The draft AIS has been revised to clarify the associations of these features and previously identified sites, include recommendations of Hawaiʻi Register of Historic Places eligibility to comply with Chapter 6E, and is submitted as an attachment to this correspondence (Attachment E).

Design Process and Alternatives

The project development process for this project is described in detail in Attachment C. Context sensitive design strategies were developed based on existing preservation and planning documents, consultation input from agencies, consulting parties, stakeholders, and the public, and key constraints and challenges of meeting geotechnical, seismic, and safety requirements with preservation and rehabilitation considerations. This process began with and references the project design parameters and structural design criteria and assumptions for evaluation as described in Chapter A5 of HDOT's "Hana Highway, Route 360, Bridge Preservation Plan" (Preservation

Plan). The project is also using the same standards and guidelines as those referenced in Chapter A4 of HDOT's Preservation Plan. Developed alternatives were then also compared against the following project evaluation criteria: 1) construction and maintenance costs, 2) design standards and service life, 3) environmental and right-of-way impacts, 3) historic character of the district and the bridges, and 5) constructability and ability to maintain traffic.

Multiple alternatives were considered for each of the six bridges proposed for improvements. These alternatives included the use of new and innovative materials for preservation and rehabilitation, repair of existing features, and replacement and reconstruction using context sensitive design. Considerations in the alternatives development and screening process were based on feasibility and constructability (cost and engineering constraints) of design alternatives and a variety of safety requirements including seismic and load standards and crash-worthiness standards for barriers. Additionally, public input on alternatives was collected during several public commenting periods and meetings. Shown in Table 1 is a list of alternatives and considerations for the Mokulehua Stream Bridge. This is intended to demonstrate the alternatives evaluation process undertaken for each of the six structures discussed in this letter.

Table 1. Example Process for Alternatives Considered

Alternative	Considerations
Preservation Plan Alternatives	
• **Alternative 1A**: Superstructure Rehabilitation with Fiber-Reinforced Polymer (FRP), Widen Bridge with Slab, New Substructure behind Existing Abutments and Replace Concrete Piers in-kind	• The degree of superstructure rehabilitation necessary to meet the seismic and load standards would result in substantial alteration to the bridge slab. Concrete thickness and FRP would be added to strengthen bridge which would alter and conceal the existing structure. FRP wrap and mixing new concrete with original concrete would produce a "patchwork" type visual impact on the District • The abutments and piers do not meet seismic and load standards and would require replacement.
• **Alternative 1B**: Superstructure Rehabilitation with Increased Slab Depth at Bottom, add Supplemental FRP, Widen Bridge with Slab, New Substructure behind Existing Abutments and Replace Concrete Piers in-kind	
• **Alternative 1C**: Superstructure Rehabilitation with Increased Slab Depth at Top, add Supplemental FRP, Widen Bridge with Slab, New Substructure behind Existing Abutments and Replace Concrete Piers in-kind	

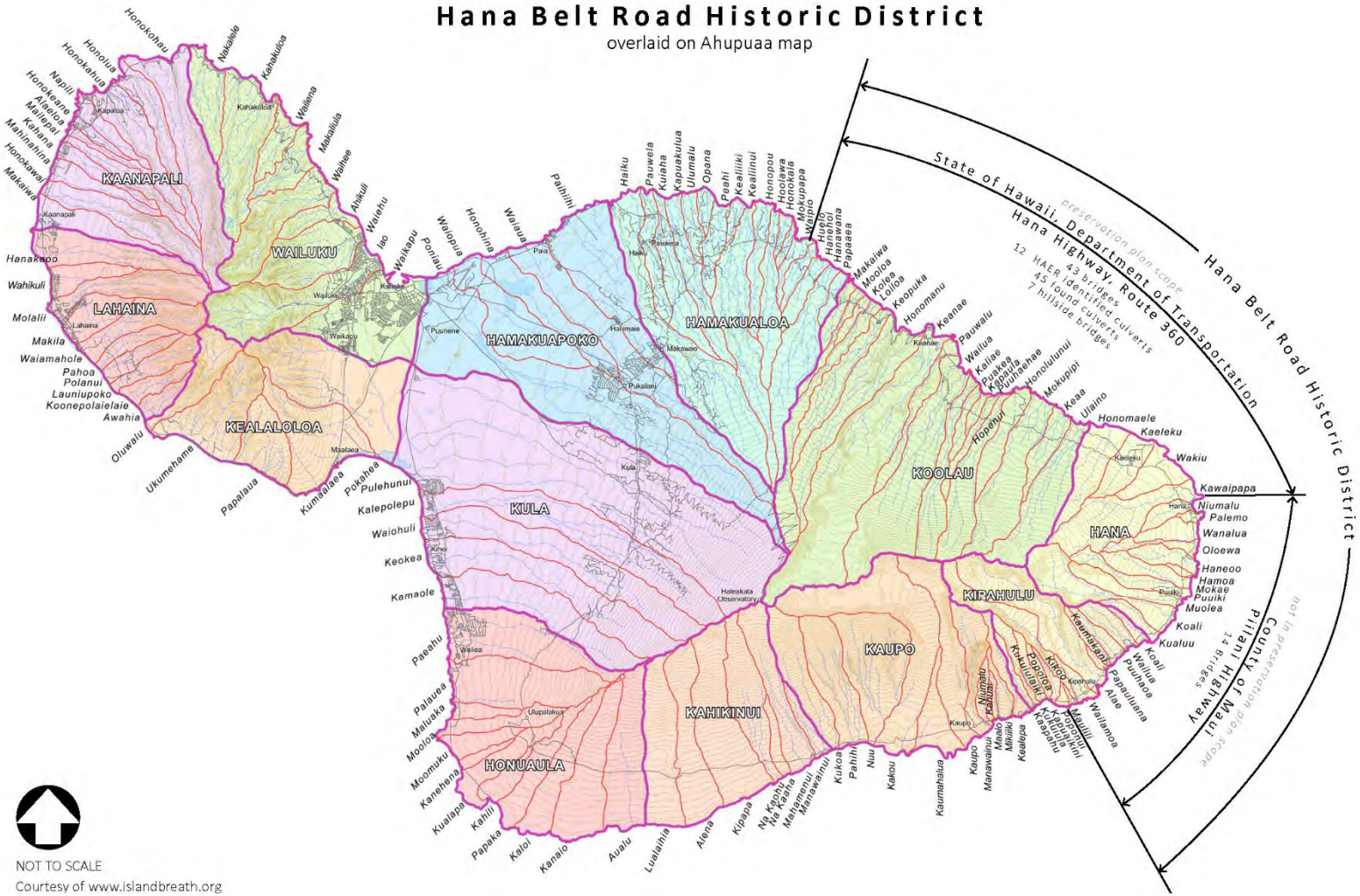
Alternative	Considerations
Additional Alternatives	

• Alternative 2: New Superstructure on new, pile-supported abutments behind retained abutments
  • Alternative 2A: Prestressed inverted tee
  • Alternative 2B: Prestressed bridge plank
  • Alternative 2C: Reinforced concrete t-beam
	• The design was modified to maintain the same railing length, resulting in approximately the same aspect ratio.
	• Some of these alternatives considered the character defining substructure elements and how to minimize impacts.
	• Improve constructability and reduce work in-stream, limiting risk during storm events.
	• New abutments would not be visible, therefore not resulting in visual effects to the District.

• Alternative 3: New Superstructure on newly constructed abutments with architectural façade
  • Alternative 3A: Prestressed inverted tee
  • Alternative 3B: Prestressed bridge plank
  • Alternative 3C: Reinforced concrete t-beam	

Railing Alternatives	
• Alternative B1: Maintain the existing railing (does not meet MASH 2016 criteria and not permitted by State Bridge Engineer)	• The general public consensus was to avoid putting a rail in front of the existing rail. • It is a substantial challenge to meet MASH TL-2 2016 criteria with a new rail placed in front of the existing rail. • FHWA-CFLHD, HDOT, and TTI have coordinated to refine an existing crash-tested rail to provide a “better” best match that can be consistently applied across the bridges in the District. Additionally, FHWA-CFLHD, HDOT and TTI have coordinated to demonstrate crashworthy compliance of a MASH 2016 TL-2 cement rubble masonry (CRM) approach barrier system which can transition onto the new bridge as appropriate to maintain a similar visual “aspect ratio” between approach CRM and bridge barrier as the existing structures.
• Alternative B2: Maintain the existing railing with MASH TL-2 bridge barrier in front	
• Alternative B3: Replace with MASH TL-2 bridge barrier	

Figure 2. **Overview of Hana Belt Road District**



Source: Hana Highway, Route 360 Bridge Preservation Plan (HDOT, 2015)

Assessment of Effects

There are 43 bridges located in the state-owned portion of the Hana Belt Road Historic District. As noted in the *Hana Highway, Route 360 Bridge Preservation Plan* individual bridges contribute to the historic character of the road. The plan categorizes the bridges into groups based on the relative significance of the bridge within the larger context of the district. Seventeen bridges and one culvert are identified as "exceptional" for having unique characteristics, features, high aesthetic value, high integrity, and remain in intact condition. Bridges designated as "exceptional" are the highest priority for preservation. The remaining 26 bridges and 11 culverts are designated as "contributing" bridges. This category includes those structures that retain integrity of setting and collectively have significant, but common character-defining features that do not rise to the uniqueness or significance of the bridge features in the "exceptional" category.

The project includes the following six bridges, three are designated as "exceptional" in the Bridge Preservation Plan.

- Kailua Stream Bridge
- Makanali Stream Bridge
- Puohokamoa Stream Bridge (Exceptional)
- Kopiliula Stream Bridge (Exceptional)
- Ulaino Stream Bridge
- Mokulehua Stream Bridge (Exceptional)

The proposed action is similar for five of the six bridges (Table 2). An overview of the proposed action for these five bridges is provided below, followed by a bridge specific effects discussion. Discussion of Kopiliula Stream Bridge, which is preserved in place, follows thereafter. Descriptions of each bridge and documented features are also provided for each respective bridge.

Table 2. Proposed Action Summary

Bridge	Proposed Action
Kailua Stream Bridge	Partial replacement
Makanali Stream Bridge	Partial replacement
Puohokamoa Stream Bridge	Partial replacement
Kopiliula Stream Bridge	Preservation
Ulaino Stream Bridge	Partial replacement
Mokulehua Stream Bridge	Partial replacement

A similar approach has been developed at five of the six bridges locations and includes the following elements/steps:

- New micropile bridge foundations would be drilled and constructed behind the existing bridge abutments.
- New bridge abutments would then be constructed on the new foundation.
- The existing superstructure and railing would be removed. The removal of the approach CRM barriers and approach walls will be limited to the upper several feet to

approximately 1’ to 2’ below the proposed roadway grade, with the majority of the existing CRM approach walls to be preserved. The stones from the removed portions of CRM approach walls would be salvaged for re-use.

- Concurrently, a new superstructure and railing would be constructed on a platform adjacent to the bridge location. This structure would be slid into place on the new bridge abutments.
- Manual for Assessing Safety Hardware (MASH) 2016 compliant CRM approach barriers would be constructed over the CRM approach wall preserved and faced with the stone salvaged from the existing CRM approach walls to closely match.

This approach generally results in superstructure elements being replaced in a context sensitive manner and substructure elements being preserved, as described below:

- **Bridge Deck**: the existing bridge deck will be replaced with a concrete deck of similar geometry as the existing bridge deck. The design team started with the same structural shape as the existing deck and modified the geometry minimally, if at all for several structures, and only as necessary to satisfy design criteria requirements for load capacity and safety.
- **Railing**: the existing railing will be replaced with a “close match” crash tested rail with modifications as permitted by the State Bridge Engineer to more closely match the existing railings while satisfying modern crash safety requirements.
- **CRM Approach Barriers**: The CRM approach barriers will be replaced with a MASH 2016 TL-2 compliant approach barrier, specifically analyzed for context sensitive design and use along the Hana Highway to match the existing CRM barriers within the District. These barriers will be faced with stone salvaged from the original CRM approach walls to the extent practical.
- **CRM Abutments**: CRM abutments will be preserved in place, with the new bridge deck being located on foundations built behind the existing abutments.
- **CRM Wingwalls**: not all bridges have CRM wingwalls, but in instances where wingwalls are present they will be preserved in place.
- **Piers**: not all bridges have existing piers, but in instances where piers are present they will be preserved in place.

Figure 3 is an approximate representation of the general approach to preserve the existing substructure elements with a new, context-sensitive superstructure.

Figure 3. Overview of the Proposed Action for Partial Replacements

Kailua Stream Bridge

In the 2015 Bridge Preservation Plan, the Kailua Stream Bridge was recommended for Preservation and Rehabilitation. Constructed in 1929, the Kailua Stream Bridge is a single-span, concrete tee beam bridge with a total length of 40 feet. The bridge has a concrete parapet wall with vertical openings. The bridge superstructure is a concrete deck slab with pavement overlay supported by four concrete tee beams. The bridge substructure is CRM abutments and wingwalls. The Kailua Steam Bridge is classified as a contributing bridge rather than an exceptional bridge in the 2015 Bridge Preservation Plan and notable for its open picket railing. The character-defining features identified in the 2015 plan include: concrete tee beam structure, CRM abutments, CRM wingwalls, natural rock formations, unusual single-span length.

The proposed improvements to the bridge include installing load-bearing piles behind the CRM abutments and replacing the concrete deck of the superstructure. The existing CRM abutments are retained and the new piles would not be visible. The new concrete deck would match existing material, texture, and other visual qualities but would be new construction.

Replacement of the bridge superstructure would substantially impact the bridge's historic integrity of materials and workmanship, and to a lesser extent, design. Although the new superstructure would closely resemble or even match the current superstructure in material, texture, and visually overall, the actual historic fabric would be replaced. Given the visual similarity, the superstructure replacement would have a minimal impact on the bridge's integrity of feeling and no impact on setting, association, or location. Retention of the CRM abutments and wingwalls with the introduction of a substructure hidden behind these historic features would minimally impact the design and association and have no impact on the bridge's integrity of feeling, setting, location. Overall, to a casual observer, the Kailua Stream Bridge would look very similar to the current, historical condition but also identifiable as a replacement bridge supported on historic substructure. The substructure would appear unchanged, and the superstructure would appear very similar to the current superstructure. The bridge's historic integrity of feeling, setting, association, and location would all remain high as related to the bridge's significance under Criterion A. However, the replacement of the superstructure substantially impacts the bridge's historic integrity of materials and workmanship that relates to its significance under Criterion C. Additionally, the integrity of design would be moderately impacted by the superstructure replacement. The new design would be similar to and complementary with the historic design, but not replicated. Therefore, the proposed undertaking would cause an adverse effect on the Kailua Stream Bridge.

Figure 1: Kailua Stream Bridge, Overview of Effects and Rendering of the Proposed Action

The bridge superstructure and railing would be replaced. The existing abutments and wingwalls would be preserved in place.

Rendering of the proposed bridge.

Makanali Stream Bridge

In the 2015 Bridge Preservation Plan, Makanali Bridge is recommended to be preserved until such time its structural deficiencies require attention, and then for rehabilitation to comply with SOI standards. Makanali Bridge (MP 8.22) is an approximately 18-foot-long, 17.7-foot-wide, single-span, reinforced concrete slab bridge built in 1928. The superstructure consists of a concrete deck slab with AC pavement overlay. The substructure consists of CRM abutments and

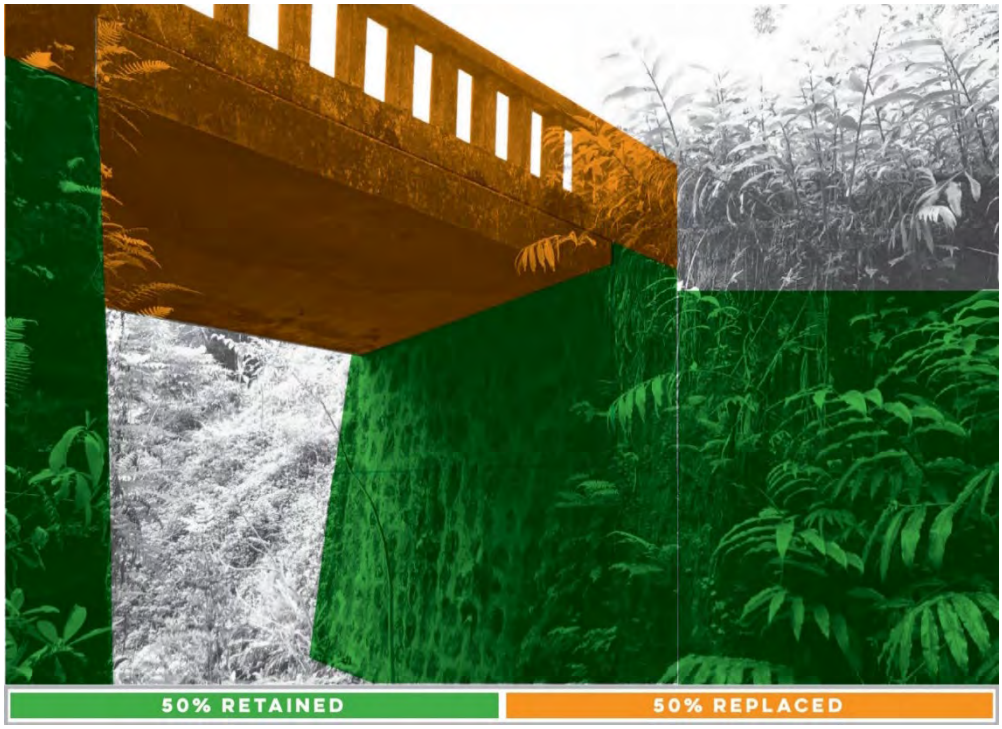
wingwalls. Makanali Bridge has concrete open vertical railing and the bridge's character-defining features, as identified in the 2015 preservation plan, include the following:

- Concrete Slab Bridge
- CRM Abutments
- CRM Wingwalls
- Concrete Open Vertical Railings

This contributing bridge is identified as a good intact example of CRM abutments and CRM wingwalls on Hana Highway, though a detracting feature is cementitious material obscuring the face of CRM abutments. It is one of five locations with the historic East Maui Irrigation (EMI) canal adjacent the bridge. The existing structural inventory load rating is 0.33. Anticipated improvements to address these noted issues include replacement of the superstructure on new buried piles behind the existing abutments to meet seismic and design loading standards, and to retain the CRM abutments and CRM wingwalls. The design would incorporate a single-lane width of 16 feet, the superstructure would be in kind materials, texture, and visual aesthetics with the existing concrete slab bridge; MASH 2016 crash-tested, best-match concrete open style parapets and CRM approach barriers with visual similarities would be incorporated into the design.

Replacement of the bridge superstructure would substantially impact the bridge's historic integrity of materials and workmanship, and to a lesser extent, design. Although the new superstructure would closely resemble or even match the current superstructure in material, texture, and visually overall, the actual historic fabric would be replaced. Given the visual similarity, the superstructure replacement would have a minimal impact on the bridge's integrity of feeling and no impact on setting, association, or location. Retention of the CRM abutments and wingwalls with the introduction of a substructure hidden behind these historic features would minimally impact the design and association and have no impact on the bridge's integrity of feeling, setting, location. Overall, to a casual observer, the Makanali Stream Bridge would look very similar to the current, historical condition but also identifiable as a replacement bridge supported on historic substructure. The bridge's historic integrity of feeling, setting, association, and location would all remain high as related to the bridge's significance under Criterion A. However, the replacement of the superstructure substantially impacts the bridge's historic integrity of materials and workmanship that relates to its significance under Criterion C. Additionally, the integrity of design would be moderately impacted by the superstructure replacement. The new design would be similar to and complementary with the historic design, but not replicated. Therefore, the proposed undertaking would cause an adverse effect on the Makanali Stream Bridge.

Figure 2: Makanali Stream Bridge, Overview of Effects and Rendering of the Proposed Action



The bridge superstructure and railing would be replaced. The existing CRM abutments and wingwalls would be preserved in place.

Rendering of the proposed bridge.

Puohokamoa Stream Bridge

Puohokamoa Bridge (MP 10.9) is an approximately 56.1-foot-long, 17.1-foot-wide, double-span, reinforced concrete tee beam bridge built in 1912. The superstructure consists of a concrete deck slab with AC pavement overlay. The substructure consists of concrete abutments supported on a CRM base with CRM wingwalls. The center concrete pier wall is supported on a CRM base. The

bridge has solid reinforced concrete parapet with "A.D. 1912" inscribed on the downstream face. Its character-defining features, as identified in the 2015 preservation plan, include the following:

- Concrete Tee Beam Bridge
- Concrete Abutments with CRM Base
- CRM Wingwalls
- Concrete Pier Wall with CRM Base
- Concrete Solid Parapets with Cap and Panel Detail
- Inset inscription "A.D. 1912" on two panels, downstream parapet

This bridge has been identified in the Preservation Plan as an Exceptional Bridge for its distinctive parapets/railings. It is also a good intact example of concrete abutments and concrete pier wall on Hana Highway. Detracting features include an inappropriate parapet repair and excessive asphalt. Puohokamoa Bridge is rated as structurally deficient due to its structural condition, and the existing structural inventory load rating is 0.35. The proposed improvements include replacement of the superstructure on new buried piles behind the existing abutments to meet seismic and design loading standards, and to retain the existing pier, CRM abutments, and CRM wingwalls. The proposed design would incorporate a single-lane width of 16 feet, the superstructure would be in-kind with the existing concrete tee beam bridge, and MASH 2016 crash-tested, best-match solid concrete railings and CRM approach barriers with visual similarities would be incorporated into the design, including replicating the cap and panel detail, as well as modified date inscriptions. Minor modifications to MASH 2016 crash tested railing must be approved by the State Bridge Engineer and consultation has occurred with the State Bridge Engineer to permit modifications to the barrier on the non-vehicle facing portions of the barrier (i.e. the outside face of the barrier) to provide aesthetic details in keeping with the existing concrete barrier.

Replacement of the bridge superstructure would substantially impact the bridge's historic integrity of materials, workmanship, and design. Although the new superstructure would closely resemble the current superstructure in material, texture, and visually overall, the actual historic fabric would be replaced including the unique, closed parapets with date inscription of the Puohokamoa Bridge classify it as an exceptional bridge. The superstructure replacement would impact the bridge's integrity of feeling and association but have no impact on integrity of setting or location. The new parapet walls would also have an inscription with the original bridge construction and the new replacement dates. While an homage to the inscription on the original bridge and in keeping with the SOI standards for rehabilitation, this represents a moderate impact to the integrity of feeling and association as the bridge would be notable as a replacement of the original structure. Retention of the existing concrete pier and CRM abutments and wingwalls with the introduction of a substructure hidden behind these historic features would minimally impact the design and association and have no impact on the bridge's integrity of feeling, setting, location. Overall, to a casual observer, the Puohokamoa Bridge would look similar to the current, historical condition and be identifiable as a replacement bridge on a historic substructure. The bridge's historic integrity of feeling, setting, association, and location would all remain relatively high as related to the bridge's significance under Criterion A. However, the replacement of the superstructure substantially impacts the bridge's historic integrity of materials and workmanship that relates to its significance under Criterion C. Additionally, the integrity of design would be moderately impacted by the superstructure replacement. The new design would be similar to and

complementary with the historic design, but not replicated. Therefore, the proposed undertaking would cause an adverse effect on the Puohokamoa Bridge.

Figure 3: Puohokamoa Stream Bridge, Overview of Effects and Rendering of the Proposed Action

The bridge superstructure and railing would be replaced. The existing abutments, wingwalls, and pier would be preserved in place.

Rendering of the proposed bridge (Date inscription on barrier not shown, but can be added into the design).

Ulaino Stream Bridge

Ulaino Stream Bridge (MP 27.92) is an approximately 39-foot-long, 18-foot-wide, double-span, reinforced concrete tee beam bridge built in 1914. The superstructure consists of a concrete deck slab with AC pavement overlay supported on four concrete tee beams in each span, which are spaced approximately 4.5 feet on center. The substructure consists of CRM abutments, a

reinforced concrete pier cap and columns supported on a concrete pier wall, and CRM wingwalls. Ulaino Bridge has concrete open vertical railing and the bridge's character-defining features, as identified in the 2015 preservation plan, include the following:

- Concrete Tee Beam Bridge
- CRM Abutments
- CRM Wingwalls
- Reinforced Concrete Pier Cap and Columns on a Concrete Pier Wall
- Concrete Open Vertical Railings

This contributing bridge is noted for its good intact example of CRM abutments, pier wall, and natural rock formations on Hana Highway. Historic information indicates that the 1914 bridge likely replaced an earlier timber bridge used for an unpaved wagon road. A detracting feature is a non-continuous downstream approach wall. The existing structural inventory load rating is 0.33. Anticipated improvements include replacement of the superstructure on new buried piles behind the existing abutments to meet seismic and design loading standards, and to retain the existing pier, CRM abutments, and CRM wingwalls. The design would incorporate a single-lane bridge width of 16 feet, the superstructure would be in-kind with the existing concrete tee beam bridge, and MASH 2016 crash-tested, best-match open-style concrete railings and CRM approach barriers would be incorporated into the design.

Replacement of the bridge superstructure would substantially impact the bridge's historic integrity of materials and workmanship, and to a lesser extent, design. Although the new superstructure would closely resemble or even match the current superstructure in material, texture, and visually overall, the actual historic fabric would be replaced. Given the visual similarity, the superstructure replacement would have a minimal impact on the bridge's integrity of feeling and no impact on setting, association, or location. Retention of the existing concrete pier and CRM abutments and wingwalls with the introduction of a substructure hidden behind these historic features would minimally impact the design and association and have no impact on the bridge's integrity of feeling, setting, location. Overall, to a casual observer, the Ulaino Stream Bridge would look very similar to the current, historical condition but also identifiable as a replacement bridge supported on historic substructure. The bridge's historic integrity of feeling, setting, association, and location would all remain high as related to the bridge's significance under Criterion A. However, the replacement of the superstructure substantially impacts the bridge's historic integrity of materials and workmanship that relates to its significance under Criterion C. Additionally, the integrity of design would be moderately impacted by the superstructure replacement. The new design would be similar to and complementary with the historic design, but not replicated. Therefore, the proposed undertaking would cause an adverse effect on the Ulaino Stream Bridge.

Figure 4: Ulaino Stream Bridge, Overview of Effects and Rendering of the Proposed Action

The bridge superstructure and railing would be replaced. The existing abutments, wingwalls, and pier would be preserved in place.

Rendering of the proposed bridge.

Mokulehua Stream Bridge

Mokulehua Bridge (MP 28.25) is an approximately 48-foot-long, 15-foot-wide, triple-span, reinforced concrete slab bridge built in 1908. The superstructure consists of a concrete deck slab with AC pavement overlay, and the substructure consists of CRM abutments, two concrete pier walls, and CRM wingwalls. The bridge has a concrete solid parapet and its character-defining features, as identified in the 2015 preservation plan, include the following:

- Concrete Slab Bridge

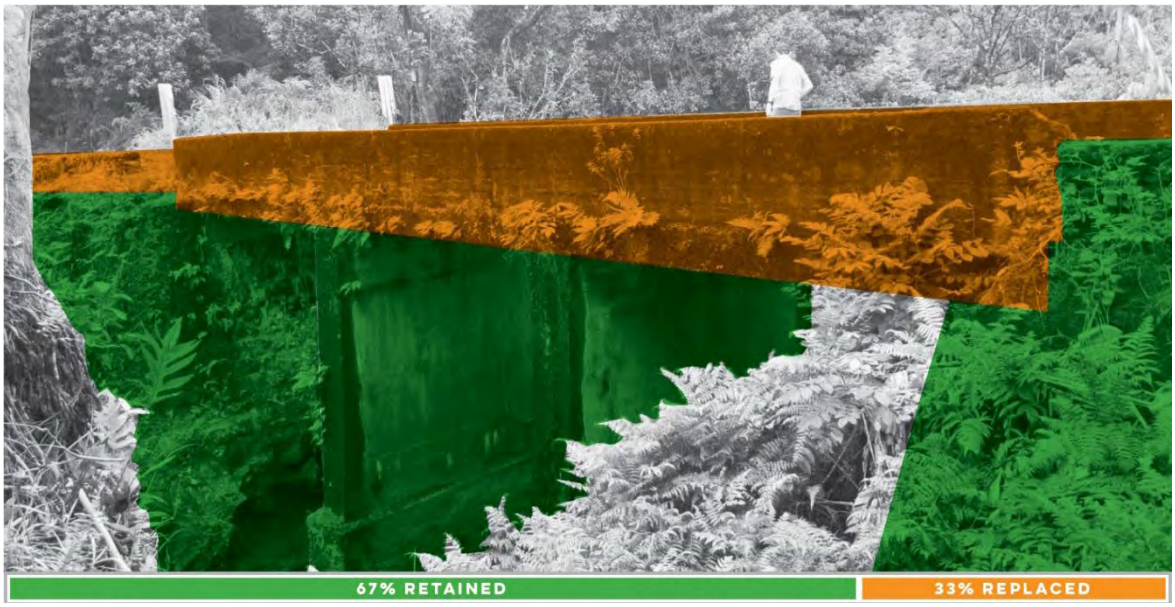
- CRM Abutments
- CRM Wingwalls
- Concrete Pier Walls with rounded cutwater profile
- Concrete Solid Parapets

This bridge has been identified in the Preservation Plan as an Exceptional Bridge for being the oldest concrete bridge on Maui and the oldest bridge on the Hana Belt Road according to DOT records. A 1990 historic bridge inventory noted the bridge replaced an earlier wood bridge and the new superstructure was constructed on top of the older bridge piers (HDOT 2015:B 40-6). It is noted to be a good intact example of CRM abutments, CRM wingwalls, solid concrete pier walls, and natural rock formations on Hana Highway. Detracting features are damaged parapet ends with exposed rebar, damaged approach wall corners, and overgrown vegetation on the bridge.

The existing structural inventory load rating is 0.33. Anticipated improvements include replacement of the superstructure on new buried abutments behind the existing abutments to meet seismic and design loading standards, and to retain the existing piers, historic cutwaters, CRM abutments, and CRM wingwalls. The design would incorporate a single-lane bridge width of 16 feet, the superstructure would be similar to the existing concrete slab bridge, and MASH 2016 crash-tested, best-match solid concrete railings and CRM approach barriers would be incorporated into the design.

Replacement of the bridge superstructure would substantially impact the bridge's historic integrity of materials, workmanship, and design. Although the new superstructure would closely resemble the current superstructure in material, texture, and visually overall, the actual historic fabric would be replaced including the unique, closed parapets of the Mokulehua Stream Bridge classify it as an exceptional bridge. The superstructure replacement would impact the bridge's integrity of feeling and association but have no impact on integrity of setting or location. Retention of the existing concrete pier and CRM abutments and wingwalls with the introduction of a substructure hidden behind these historic features would minimally impact the design and association and have no impact on the bridge's integrity of feeling, setting, location. Overall, to a casual observer, the Mokulehua Stream Bridge would look similar to the current, historical condition and be identifiable as a replacement bridge on a historic substructure. The bridge's historic integrity of feeling, setting, association, and location would all remain high as related to the bridge's significance under Criterion C. The oldest part of the bridge, the concrete piers that purportedly predate the 1908 superstructure would be preserved. However, the replacement of the superstructure substantially impacts the bridge's historic integrity of materials and workmanship that relates to its significance under Criterion C. Additionally, the integrity of design would be moderately impacted by the superstructure replacement. The new design would be similar to and complementary with the historic design, but not replicated. Therefore, the proposed undertaking would cause an adverse effect on the Mokulehua Stream Bridge.

Figure 5: Mokulehua Stream Bridge, Overview of Effects and Rendering of the Proposed Action



The bridge superstructure and railing would be replaced. The existing abutments, wingwalls, and piers with upstream cut waters would be preserved in place.

Rendering of the proposed bridge.

Kopiliula Stream Bridge

Kopiliula Bridge (MP 21.7) is an approximately 77-foot-long, 17.7-foot-wide, double-span, reinforced concrete girder and floorbeam system bridge built in 1926 (though possibly in 1914). The superstructure consists of a concrete deck slab with AC pavement overlay supported on a reinforced concrete girder and floorbeam system. The concrete through girders also function as the bridge's parapets. The substructure consists of reinforced concrete abutments and pier columns and wingwalls.

This bridge has been identified in the Preservation Plan as an Exceptional Bridge as it is the only bridge with East Maui Irrigation equipment attached to the bridge on Hana Highway. It is also a

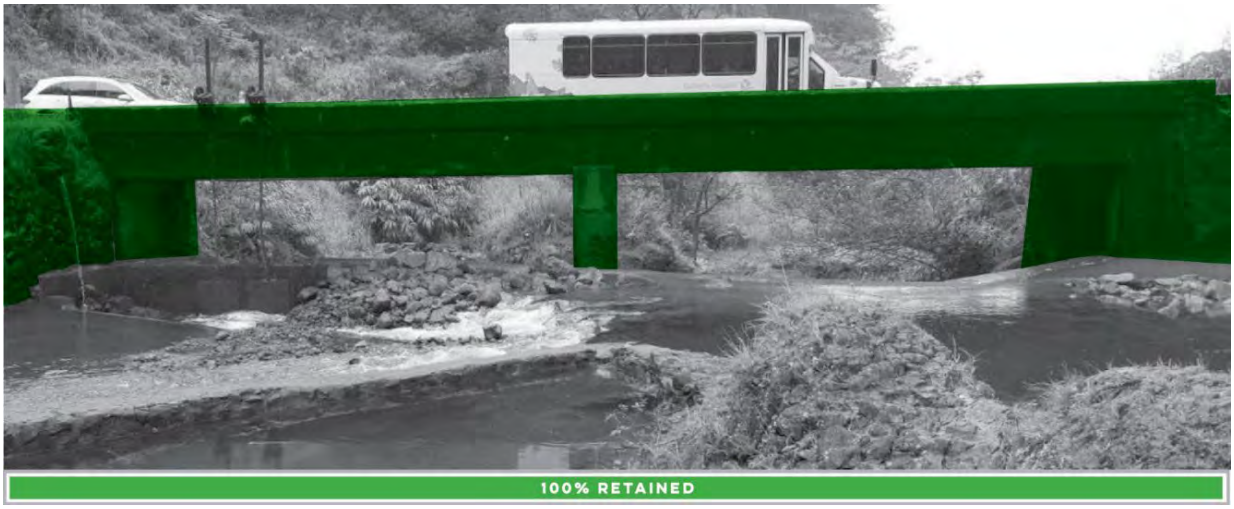
good intact example of concrete abutments, concrete pier columns, CRM wingwalls, and natural rock formations on Hana Highway. Its character-defining features, as identified in the 2015 preservation plan, include:

- Concrete Girder and Floor Beam System
- Reinforced Concrete Pier Columns
- CRM Wingwalls
- Concrete Solid Parapets with EMI gears attached
- EMI irrigation system, dam and sluice gate below

Kopiliula Bridge has one of the lowest load ratings of all bridges on the HDOT-maintained portion of Hana Highway. The existing structural inventory load rating is 0.19, which is well under the rating of 1.00 that indicates a structure can carry the design load rating vehicle specified by AASHTO and HDOT.

The Kopiliula Bridge is planned for preservation in place with a new bridge constructed *makai* of the historic bridge. Preservation of the existing bridge would retain all the character-defining features of the bridge identified in the 2015 preservation plan. Construction of a new bridge adjacent to the existing bridge would not affect the Kopiliula Bridge's significance under Criterion C and have no impact on its historic integrity of location, design, workmanship, or materials. The new bridge would introduce a new visual element to the bridge's historic setting and would therefore impact the bridge's historic integrity of setting and feeling. However, this impact would not directly alter any of the features that make the bridge eligible for listing in the NRHP and therefore does not meet the Criteria of Adverse Effect (36 CFR 800.5). The bridge's integrity of association would be negligibly impacted by no longer being an in-use bridge, but would still be recognizable as a historic bridge and a part of the history of the Hana Highway and an integrated design with the East Maui Irrigation equipment that reflects that unique association. Therefore, the proposed improvements would not constitute an adverse effect on the Kopiliula Bridge or the EMI System features either embedded with the bridge features or in the immediate vicinity.

Figure 6: Kopiliula Stream Bridge, Overview of Effects and Rendering of the Proposed Action



The existing bridge would be preserved in place.

Ground level rendering of the proposed bridge.

Aerial rendering of the proposed bridge.

Historic District Effects Analysis

The Hana Belt Road was listed in the NRHP as a historic district in 2001. The nomination lists 73 contributing structures and 1 non-contributing structure (Kawaipapa Bridge). The district is listed with significance under Criterion A under the areas of Social History, Transportation, and Commerce and under Criterion C under Engineering, with a period of significance from circa 1900 to 1947. The district encompasses approximately 42 miles of the highway and the boundary is defined as the highway right-of-way, or a corridor of 40 feet width centered on the highway. Alterations over the years include reconstruction of damaged areas, widening of the roadway in areas, the addition of steel guardrails, unsympathetic repairs to CRM walls and bridge railings, and layers of pavements. The 2001 NRHP nomination notes that despite these alterations over nearly 100 years:

> "The Hāna Belt Road retains its historic character and integrity. For the most part, the road is relatively unaltered. The road's alignment has not been changes since it was complete in 1926, although sections of the road on sea cliffs have collapsed into the ocean and necessitated reconstruction. The road retains its historic character and integrity in its rural location and narrow lanes […] sharp and narrow approaches, original materials, and original design. Although a majority of bridges are quite simple in appearance, several bridges are more elaborate and were designed and built by masters. The bridge designs and materials survive intact, with a few minor exceptions."

As noted previously, the 2015 bridge preservation plan identifies 18 bridges as exceptional due to unique characteristics that are the highest priority for preservation. The remaining 26 bridges and 11 culverts are designated as "contributing bridges" and share common designs, aesthetics, or features with other structures in the district. Although the improvements to five of the six bridges proposed are noted previously as causing adverse effects to the individual bridges, an adverse effect on the overall historic district is not a certainty. The adverse effects analysis for the overall district considers the features that are retained or replaced on each bridge, along with the presence and commonality of those features as found throughout the rest of the Hana Belt Road Historic District. Specifically, for the "exceptional" bridges noted in the bridge preservation plan planned for improvements:

- Are character-defining features unique within the historic district substantially altered or lost?
- For the "contributing" bridges, are those features that represent common designs or aesthetics that will be altered or lost found elsewhere in the district?

The NRHP nomination for the district does not explicitly note character-defining features of the district, but the boundary description notes that the section delineated contains "the most spectacular portion of Maui's historic belt road system, both in scenery and historic character." The nomination also identifies the boundaries as containing "the highest concentration of stylistically consistent historic bridges" in the state. An amendment to the nomination noted the road itself and not just the bridges and culverts should be considered a contributing element, and the district has a total of 74 contributing elements and 1 non-contributing element. Considering those statements and other specific elements called out in the nomination, the key character-defining features of the overall district that display its areas of significance include:

- The alignment within East Maui's uniquely rugged topographical setting;

- Engineering design features responsive to setting and topography;
- Scenic vistas; and
- Consistent stylistic elements

In assessing the potential for adverse effects to the overall district, the analysis should primarily focus on the district's character-defining features and how those will or will not be substantially altered in a manner that impacts the district's historic integrity in seven aspects.

This assessment of effects on the Hana Belt Road Historic District was aided by standardizing the categorization of bridges in both the state-managed and county-managed sections. The 2015 preservation plan provides the most detailed categorization typology, based on the primary characteristics and relative integrity of each bridge. Exceptional bridges exhibit unique characteristics, have exceptional setting or history, and/or a high level of historic integrity. Contributing bridges may be representative of a bridge type, have compromised integrity, and/or appear to have been heavily altered. The NRHP nomination, the 2001 Maui County bridge preservation plan, and the 2015 Statewide Bridge Inventory were all consulted to categorize the bridges from Hana to Kipahulu based on the typology used in the 2015 plan. Table 3 summarizes all structures in the historic district, along with the typology categorizations used in the 2015 bridge plan.

Table 1. Summary of Bridges Within the Hana Belt Road Historic District Categorized by 2015 Typology

Typology	Huelo to Hana	Hana to Kipahulu	Historic District Total
Exceptional-Curved	4	-	4
Exceptional-Arched	3	4*	7
Exceptional-Distinctive Piers	3	-	3
Exceptional-Distinctive Parapets	4	-	4
Exceptional -Oldest	1	-	1
Exceptional -East Maui Irrigation	1	-	1
Exceptional -Post World War II	1**	1	2
Contributing-Open Parapets	20	1	21
Contributing-Solid Parapets	6	6*	12
Non-Contributing***	-	4	4
Total	43	16	59

*Includes one bridge within boundaries of Haleakala National Park

**Kawaipapa Bridge: 2001 NRHP states non-contributing; 2014 Statewide Inventory & 2015 Preservation Plan states contributing

***Bridges replaced by the County between 2011 and 2014

The cumulative effect of past, current, and foreseeable future undertakings applies to the overall historic property, the Hana Belt Road Historic District, rather than individual contributing properties to the district. Regardless, the characteristic features and the unique qualities and setting of individual features contribute to the overall historic character and integrity of the historic district. While the replacement of one bridge of a type with several examples on the Hana Belt Road may not significantly diminish the overall historic integrity of the district, the loss of a majority of or all bridges of a specific type or even one of the "exceptional" examples noted

previously may meet the criteria of adverse effect [36 CFR 800.5(a)(1)]. With consideration of future foreseeable actions, the sum total of these impacts on the historic district is presented in Attachment D.

In summary of the past alterations, the overall historic character of the Hana Belt Road remains intact and holds high integrity in all seven aspects, as noted in the 2001 NRHP nomination and documentation, studies, and plans written since. The predominant alterations in number have been related to improving safety with largely reversible additions, such as steel beam guardrails, basalt guardwalls, road striping, reflector posts, and signage. While these elements have been introduced across the entire length of the district, the application is not part of a consistent plan. Referring specifically to the character-defining features of the historic district, these safety changes have not altered the alignment, examples of unique engineering, scenic vistas, nor any of the consistent stylistic elements. Furthermore, these additions have not collectively diminished the district's historic integrity. In the twenty-first century, bridges have begun to be repaired, rehabilitated, or replaced depending on the bridge type, condition of structural elements, and extenuating circumstances. The County has replaced four bridges in the section it maintains between Hana and Kipahulu. All four were concrete-deck structures, two with solid parapets, one with open parapets, and one where the original parapet had been removed as part of a previous repair. Solid parapets are the predominant type between Hana and Kipahulu, while open parapets are more common between Huelo and Hana. As noted previously, the concrete deck structures are the most common bridge type and while the replacement of these four bridges represent a loss of characteristics of the overall historic district, multiple representative examples of concrete deck structures with open and solid parapets remain in great numbers throughout the district.

Six bridges currently in design development in the HDOT-maintained segment from Huelo to Hana include two of the three bridges categorized as "exceptional" in the 2015 preservation plan, one as "exceptional with distinctive parapets," and three as "contributing with open parapets." Alterations of the three exceptional structures have the greatest potential to impact the overall integrity of the historic district. The design process for these three bridges is considering solutions to preserve or maintain character-defining features, where possible. When new structural or safety elements will be implemented, those designs will consider the Secretary of the Interior's Standards for the Treatment of Historic Properties. Each of the four treatments is distinct, but the hierarchy prioritizes preservation of original elements, replacement in-kind when preservation is not possible, replacement with compatible or sensitive materials or design, and reconstruction or replacement as a last resort. While the current design solutions attempt to minimize adverse effects on the overall historic district, the potential for adverse effects remains. More general character-defining features of the historic district identified previously will be preserved or minimally altered, specifically the alignment in context with the rugged topography and the scenic vistas. Road approaches to the bridges will be maintained wherever feasible, so the alignment will remain minimally altered. Returning to the Standards for Treatment, preservation or rehabilitation of a property contributing to a historic district that continues a historic function or use ultimately results in the least alteration of characteristic features and minimizes diminishment of the district's integrity overall. Indeed, the function or use of a property directly relates to its integrity of location, feeling, association, and design and indirectly to setting, materials, workmanship. Therefore, perpetuation of a historic function has a direct correlation of maintaining a property's historic integrity. Proposed improvements to five of the historic bridges will address structural deficiencies that will extend the functional lifespan of these structures and

thereby extend the historical use of the overall resources. The sixth bridge (Kopiliula) will be preserved, retaining all character-defining features of the bridge and the EMI System.

Currently planned foreseeable actions with a potential to affect the historic district are described in Attachment D. Future work is anticipated for four additional bridges between Huelo and Hana. Following the categorization in the 2015 plan, two are categorized as "exceptional with distinctive parapets" and two are "contributing with open parapets." Future work is planned between Hana and Kipahulu at three additional bridges, all with a solid parapet. Considering these future actions along with past and currently proposed actions, three of the five bridges identified in the 2015 plan as exceptional with distinctive parapets will have been altered to some degree. Although solid parapets are the predominant type between Hana and Kipahulu, eight of the sixteen bridges with solid parapets will have been altered or replaced in the historic district. Taken collectively, these actions have the potential to adversely affect the overall historic district through alteration or removal of characteristics in ways that diminish the district's historic integrity of design, feeling, and workmanship and potentially also materials. Implementing the design procedures used on the current project for future actions may minimize these effects by prioritizing those features of individual bridges which are unique within the district or contribute most to the character of the district through representation of consistent stylistic features, scenic vistas, or the engineering features that are directly responsive to the challenges presented by topography.

The six bridges proposed for improvements include three contributing bridges with open parapet railings and three exceptional bridges, one with distinctive parapet, one noted as the oldest, and one with embedded EMI structures.

The three contributing bridges will all have the superstructure replaced including the deck and the parapet railings. The replacement railings will be complementary in design with similar openings to the original. Other features of these three bridges will be retained, including the existing CRM approach walls, abutments, and wingwalls. As noted in Table 3, the district includes 21 bridges in the Contributing-Open parapets category. For these three bridges, the character-defining features of the historic district will not be altered in a manner that diminishes the district's historic integrity. All three bridges and locations will still reflect East Maui's rugged topographical setting, design features responsive to and integrated with that setting, scenic vistas, and consistent stylistic elements. For the last, consistent stylistic elements retained will include the CRM approach walls, abutments, and wingwalls as well as concrete piers on two of the bridges. Although the decks and railings will be replaced, the materials will be in kind (concrete) and use complementary design similar to the original parapet railings and to the historic railings found on the 18 other contributing-open parapets bridges in the district.

The one exceptional-distinctive parapets bridge (Puohokamoa Stream Bridge) planned for improvements has solid parapets with a date inscription. While the deck and solid parapets will be replaced as part of the improvements, other features of the bridge that relate to the district's character-defining features will be retained, including concrete abutments, CRM wingwalls, and concrete pier with CRM base. All of those features speak to the bridge's and the district's topographic- and setting-responsive design. The most significant alteration on the Puohokamoa Stream Bridge is the replacement of the original railing. Although an adverse effect on that individual bridge, the complementary design with in-kind materials meets the SOI standards for

rehabilitation and includes a new date inscription that reflects the historic construction and new work. Additionally, three other bridges in the district are noted as exceptional for having distinctive parapets and three more Exceptional bridges have distinctive piers. The new deck and complementary parapet railing will maintain consistent stylistic elements in the district.

The two other exceptional bridges planned for improvements include the oldest bridge (Mokulehua) and Kopiliula Stream Bridge which contains integrated features with the EMI System. The proposed improvements at these two locations would not alter the character-defining features of the historic district listed above, specifically the rugged setting of East Maui, a design responsive to that setting, scenic vistas, and consistent stylistic elements. For Kopiliula, its preservation in place also means the unique aspect of that bridge, the EMI System features, would be retained and preserved.

Therefore, FHWA-CFLHD has determined the current undertaking would have No Adverse Effect on the Hana Belt Road Historic District. The proposed improvements at five bridges include designs that are responsive to the setting and topography and do not affect scenic vistas or significantly alter the natural topography of East Maui. The retention of key significant features of each bridge and the use of complementary new design that respects and relates to the historic fabric maintains the consistent stylistic design within the district.

FHWA-CFLHD's determinations of effect for this undertaking are summarized in Table 4.

Table 2. Summary of FHWA-CFLHD's Determinations of Effect under Section 106 of the NHPA

Historic Property	SIHP #	Significance	Effect Determination
Kailua Stream Bridge	SIHP 50-50-06-01638	a and c	Adverse Effect
Makanali Stream Bridge	SIHP 50-50-07-01638	a and c	Adverse Effect
Puohokamoa Stream Bridge	SIHP 50-50-07-01509	a and c	Adverse Effect
Ulaino Stream Bridge	SIHP 50-50-13-01638	a and c	Adverse Effect
Mokulehua Stream Bridge	SIHP 50-50-13-01638	a and c	Adverse Effect
Kopiliula Stream Bridge	SIHP 50-50-12-01638	a and c	No Adverse Effect
Former Residence Foundation	TS-1	d	No Historic Properties Affected
East Maui Irrigation Network	SIHP 50-50-12-01508	d	No Historic Properties Affected
Hana Belt Road Historic District	SIHP 50-50-VA-01638	a and c	No Adverse Effect

Previous Documentation and Mitigation Activities

The Hana Belt Road was documented for the Historic American Engineering Record (HAER) in 2005 by a NPS Heritage Documentation team. The documentation (HAER HI-75) included 13 drawings and 181 photographic images. Additionally, the following structures within the district have been documented individually:

- Papaahawahawa Bridge - HAER HI-34
- Paihi Gulch Bridge - HAER HI-63
- Kaikau'ai Bridge (Koukou'ai Bridge) - HAER HI-70
- Waiohonu Bridge - HAER HI-71
- Kapi'a Stream Bridge (Kahawaiokapa Bridge) - HAER HI-72
- Hamakua Ditch (East Maui Irrigation Company) - HAER HI-77
- Haneoo Bridge (Kaholopo Bridge) – HAER HI-98

Mitigation Alternatives

Previous mitigation for adverse effects on the Hana Belt Road Historic District has primarily consisted of HAER documentation for bridges prior to replacement or substantive rehabilitation. While this mitigation activity documents the historic design of a specific bridge, it does not consider or relate to the character of and potential effects on the historic district as a whole. A coordinated and comprehensive mitigation approach that considers effects to the overall historic district can provide an appreciable public benefit and help to preserve the historic character of the district, which goes above and beyond HAER documentation requirements. Potential mitigation alternatives for your consideration are listed below.

Design Decision Process for Future Projects

Although FHWA-CFLHD's determination of effects does not include adverse effects on the historic district but rather adverse effects on five individual bridges, appropriate mitigation could include documentation of a design decision process to benefit future bridge preservation, rehabilitation, and replacement projects within the historic district. This comprehensive approach could use the 2015 bridge preservation plan as a starting point but also include: bridges maintained by Maui County; other characteristics and features for preservation that contribute to the setting and are not presently included in the plan; geotechnical, seismic, and safety considerations; and a standardized approach for the development and review of design alternatives that may avoid or minimize adverse effects to the historic district.

The implementation of current and future actions has a direct relationship to the extent and intensity of the alteration, removal, and/or replacement of character-defining features of the Hana Belt Road Historic District. The development of a design process may be achieved through updating the existing foundational and planning documents (see below) or as a standalone tool based on those documents. In either case, the resulting process would have a substantial and beneficial impact on the preservation of the overall character of the historic district by implementing consistency in design decisions and a consistent management approach for not only the individual elements composing the district, but also the overall character of the district.

The 2015 bridge preservation plan includes recommendations for the highest or best practices for preservation of structures. While preservation is always the preferred treatment, new information, site-specific engineering constraints, or safety and seismic considerations may require alternative approaches to achieve consistent solutions. This proposed design decision process should draw upon this and other planning documents to better define the overall characteristics of the historic district and prioritization of features that best convey its significance and the features of individual bridges that contribute to the historic district's character. Through this process, the

specific needs of historic preservation, safety requirements, and structure longevity and maintenance considerations can all be maximized across the entire historic district. Such an approach may also reveal unique solutions that fit the key characteristics of the district—design responsive to topography and setting, scenic vistas, and consistent stylistic elements—and may, in the future, be acknowledged as significant in their own right for contributing to the history of the Hana Belt Road. Examples of decisions and selection guidance that could be incorporated into a design decision process for the entire district may include the following: preservation priorities and selection process for bridge treatments, design exception considerations, rail type designs and guidance for consistent selection, approach rail designs and guidance for consistent selection, constructability, geometric site constraints, life-cycle cost, and maintenance of traffic considerations.

Update Foundational and Planning Documents

The NRHP nomination for the Hana Belt Road is twenty years old and does not specifically note character-defining features of the overall historic district, the features of each bridge that contribute to the district's character, nor the current status of contributing and non-contributing elements. As a NRHP-listed district, the nomination is the foundational document for regulatory compliance with Section 106. In the absence of this information from the foundational document, compliance with each undertaking requires an analysis of these characteristics that has the potential to be inconsistent with previous analyses. An updated NRHP nomination for the district would allow for a standardized starting point for consistently assessing change within the district, both from management and regulatory perspectives.

In coordination with updating the NRHP nomination form, the two preservation plans that concern the historic district could be updated and consolidated into a Historic District Management Plan. This planning tool would consider the characteristics of the district as a whole and the features of individual components (bridges, structures, and roadway) that contribute to the significance of the whole. Creation of a comprehensive Historic District Management Plan would more easily facilitate the development of, and could encompass, a design decision process as listed above. The updated consolidated plan could supersede the separate individual plans to provide a single source for a consistent management approach.

Historical Interpretation

Mitigation for current and future actions within the historic district could include activities that provide an educational benefit and foster appreciation of the unique history and qualities of the historic district. Interpretive materials may range from more traditional types, such as videos and printed publications, to capitalizing on more recent technological innovations like interactive websites and applications or augmented reality.

A recent innovation that works particularly well for interpreting linear historic resources is the ArcGIS Story Map™. Story Maps allow users to explore a place through rich, multimedia content, and has been used locally for resources such as the Pearl Harbor site and Hawaii Capital Historic District. Story Maps can allow users to explore historic places by location, chronologically, or thematically. The interpretation of the Hana Belt Road Historic District provides a unique opportunity to blend history, geography, and community.

HRS Chapter 6E Compliance

As described above, this project is now also subject to review in accordance with HRS, Chapter 6E-8. Summarized below includes a discussion specific to significance evaluations and effect determinations pursuant to HAR §13-276.

Identification and Inventory of Historic Properties (HAR §13-275-5)

Scientific Consultant Services, Inc. (SCS) conducted an AIS for this project between December 2019 and February 2020 (Dega et al 2020; Attachment E). The survey covered an area of 8.8 acres and included areas around the six bridges proposed for improvements and one discontiguous construction staging area. As noted in the report, two previously identified and evaluated historic properties were in the APE—the Hana Belt Road is listed in the NRHP (NR No. 01000615/SIHP No. 50-50-va-01638) and the East Maui Irrigation (EMI) System (SIHP No. 50-50-07-01508). The AIS identified nine (9) features and all but one of these features are associated with either the Hana Belt Road or the EMI System. The AIS was submitted to SHPO on September 8, 2020 along with a request for concurrence with eligibility determinations. The AIS has been updated since then, (updated portions highlighted in Attachment E - AIS) to include reporting components consistent with HAR §13-276-5 and include evaluations for Hawai‘i Register of Historic Places eligibility (HAR §13-275-6) and is included with this submittal as Attachment E.

Evaluation of Significance (HAR §13-275-6) and Integrity

As noted above, the Hana Belt Road is listed in the NRHP under Criteria a and c. The EMI System was previously assessed in 1992 as significant under Criterion d. The AIS noted that nine (9) features were identified during survey, all historic features. Eight features identified are associated with either the Hana Belt Road, historic bridges, or the EMI. System. The other feature (TS-1) is a foundation of a house with a wall and slab located near the Mokulehua Stream Bridge identified as significant under Criterion D. The identified features associated with the Hana Belt Road and related bridges are significant under Criteria a and c, the same significance as the Hana Belt Road historic district is listed under. The EMI System was previously evaluated in 1992 as significant under Criterion d, no change to that is recommended. The feature TS-1 which is a former house foundation is evaluated as significant under Criterion d.

Effect Determination (HAR §13-275-7)

Based on surveys conducted for this project and previous evaluations and consultation of listed properties, FHWA-CFLHD and HDOT have determined the Hana Highway Bridge Improvements Project would have an “effect, with proposed mitigation commitments” per HAR §13-275-7(a)(2).

Table 3. Effects Determination under HRS 6E-08

Historic Property	Significance Criteria	Effect Determination HRS 6E-08	Notes
Kailua Stream Bridge SIHP 50-50-06-01638	a and c	Effect, with proposed mitigation commitments	superstructure replacement, preservation of existing CRM abutments and wingwalls with new micropiles hidden behind.

Historic Property	Significance Criteria	Effect Determination HRS 6E-08	Notes
Makanali Stream Bridge SIHP 50-50-07-01638	a and c	Effect, with proposed mitigation commitments	superstructure replacement, preservation of existing CRM abutments and wingwalls with new micropiles hidden behind.
Puohokamoa Stream Bridge SIHP 50-50-07-01509	a and c	Effect, with proposed mitigation commitments	superstructure replacement, preservation of concrete pier and CRM abutments and wingwalls with new micropiles hidden behind.
Ulaino Stream Bridge SIHP 50-50-13-01638	a and c	Effect, with proposed mitigation commitments	superstructure replacement, preservation of concrete pier cap, columns, and pier wall and CRM abutments and wingwalls with new micropiles hidden behind.
Mokulehua Stream Bridge SIHP 50-50-13-01638	a and c	Effect, with proposed mitigation commitments	superstructure replacement, preservation of concrete pier walls and CRM abutments and wingwalls with new micropiles hidden behind.
Kopiliula Stream Bridge SIHP 50-50-12-01638	a and c	Effect, with proposed mitigation commitments	historic bridge preserved in place, new bridge constructed adjacent and makai of current bridge
East Maui Irrigation Network SIHP 50-50-12-01508	d	No historic properties affected	bridge and EMI system features preserved in place
Former House Foundation SIHP TS-1	d	No historic properties affected	within APE but 30-40 meters north of Mokulehua Bridge; will not be affected.
Hana Belt Road Historic District SIHP 50-50-VA-01638	a and c	Effect, with proposed mitigation commitments	Presently 55 contributing bridges, 4 non-contributing bridges. Kopiliula would be preserved, 5 other bridges would continue to be contributing under ‘a’ but non-contributing under ‘c’

(Proposed) Mitigation (HAR §13-275-8)

Under HAR §13-275-8, if a project will have an effect on significant historic properties, then a mitigation commitment proposing the form of mitigation to be undertaken for each significant historic property shall be submitted by the agency to SHPD for review and approval. The HAR identifies five forms of mitigation which can occur: preservation, architectural recordation, archaeological data recovery, historical data recovery, or ethnographic documentation. Mitigation is expected to include one or more alternatives described earlier in this correspondence. The table

below includes information about these five mitigation types and the mitigation proposed that is relevant to or mitigates the effect on specific resources. The effects are generally identical for five of the bridges proposed for improvements and those five bridges are grouped accordingly in the table below.

Table 4. Proposed Mitigation for Historic Properties under HRS §6E-08

Mitigation Type	**Kailua Stream Bridge SIHP 50-50-06-01638, Makanali Stream Bridge SIHP 50-50-07-01638, Puohokamoa Stream Bridge SIHP 50-50-07-01509, Ulaino Stream Bridge SIHP 50-50-13-01638, Mokulehua Stream Bridge SIHP 50-50-13-01638**	**Kopiliula Stream Bridge SIHP 50-50-12-01638**	**East Maui Irrigation Network SIHP 50-50-12-01508**	**Hana Belt Road Historic District SIHP 50-50-VA-01638**
Preservation, which may include avoidance and protection (conservation), stabilization, rehabilitation, restoration, reconstruction, interpretation, or appropriate cultural use. (HAR §13-275-8(a)(1)(A)	Preservation of concrete and CRM substructure and CRM retaining walls. Interpretation of bridges or district overall via physical printed or digital media.	Preservation of all physical features of bridge through avoidance.	Preservation of all physical features of bridge through avoidance.	Preservation of concrete and CRM substructure and CRM retaining walls. Development of design decision process and/or update of foundational and planning documents will promote preservation and resource-sensitive rehabilitation or restoration of resources in district. Interpretation of bridges or district overall via physical printed or digital media.

Mitigation Type	Kailua Stream Bridge SIHP 50-50-06-01638, Makanali Stream Bridge SIHP 50-50-07-01638, Puohokamoa Stream Bridge SIHP 50-50-07-01509, Ulaino Stream Bridge SIHP 50-50-13-01638, Mokulehua Stream Bridge SIHP 50-50-13-01638	Kopiliula Stream Bridge SIHP 50-50-12-01638	East Maui Irrigation Network SIHP 50-50-12-01508	Hana Belt Road Historic District SIHP 50-50-VA-01638
Architectural recordation, which involves the photographic documentation and possibly the measured drawing of a building, structure or object prior to its alteration of destruction. (HAR §13-275-8(a)(1)(B)	Recordation through LiDAR and BIM/digital twin will produce precise measured model of bridges prior to alteration.	Recordation through LiDAR and BIM/digital twin will produce precise measured model of bridges prior to alteration.	Not applicable to this historic property.	Recordation through LiDAR and BIM/digital twin will produce precise measured model of bridges prior to alteration and contribute to documentation of information in district overall.
Archaeological data recovery, which enables the recovery of an adequate and reasonable amount of significant information from a significant historic property prior to its alternation of destruction. Data recovery may include archaeological mapping, surface collection, excavation, monitoring, laboratory analyses, and interpretive analyses. (HAR §13-275-8(a)(1)(C)	Not applicable to this historic property.	Not applicable to this historic property.	Not applicable to this historic property.	Not applicable to this historic property.
Historical data recovery, which involves researching historical source materials to document an adequate and reasonable amount of information about the property when a property will be altered or destroyed. (HAR §13-275-8(a)(1)(D)				

Mitigation Type	Kailua Stream Bridge SIHP 50-50-06-01638, Makanali Stream Bridge SIHP 50-50-07-01638, Puohokamoa Stream Bridge SIHP 50-50-07-01509, Ulaino Stream Bridge SIHP 50-50-13-01638, Mokulehua Stream Bridge SIHP 50-50-13-01638	Kopiliula Stream Bridge SIHP 50-50-12-01638	East Maui Irrigation Network SIHP 50-50-12-01508	Hana Belt Road Historic District SIHP 50-50-VA-01638
Ethnographic documentation, which involves interviewing knowledgeable individuals and researching historical source materials to document an adequate and reasonable amount of information about the property when a property will be altered or destroyed. (HAR §13-275-8(a)(1)(E)	Not applicable to this historic property.	Not applicable to this historic property.	Not applicable to this historic property.	Not applicable to this historic property.

Conclusion

Based on the preceding information and supplemental information provided in attachments to this letter, FHWA-CFLHD has determined that this undertaking would have an adverse effect on historic properties under Section 106 of the NHPA. Therefore, FHWA-CFLHD is seeking SHPD concurrence with our agency's determinations of eligibility and determination of adverse effect for this proposed undertaking under Section 106 of the NHPA. Additionally, FHWA-CFLHD and HDOT is seeking a letter of determination of "effect, with proposed mitigation commitments," as defined in HAR §13-275-7, as the project would affect one or more significant historic properties. Furthermore, FHWA-CFLHD requests a meeting to discuss mitigation alternatives to resolve adverse effects under Section 106 of the NHPA and inform the determination of "effect, with proposed mitigation commitments" under HAR §13-275-7.

We kindly request a response within 45 days of receipt of this correspondence. Please provide your written comments to: Tomasz Kubicz, Federal Highway Administration, 12300 West Dakota Avenue, Suite 380A, Lakewood, CO 80228 or by email to Tomasz.Kubicz@dot.gov.

Please also feel free to contact Greg Badon, Environmental Protection Specialist, at (720) 963-3627, email: Gregory.Badon@dot.gov, if you have any questions. Thank you for your time and assistance with this project.

Sincerely,

Tomasz Kubicz, P.E.
Project Manager

Attachments:

- Attachment A – Area of Potential Effects (APE) and Tax Map Key (TMK) Map Figures
- Attachment B – Consultation Record and Correspondence
- Attachment C – Technical Memorandum Regarding Consistency in Context Sensitive Design Decisions for Bridge Improvements along the Hana Highway
- Attachment D – Cumulative Effects Analysis for the Hāna Belt Road Historic District Bridge Improvement Project
- Attachment E – Revised Draft ARCHAEOLOGICAL INVENTORY SURVEY FOR THE HĀNA HIGHWAY BRIDGE IMPROVEMENT PROJECT PU‘UOMĀILE AND PĀPA‘A‘EA, EAST MAKAĪWA, KŌLEA, LOILOA, KALIAE, KEKUAPAWELA, ‘ULA‘INO, AND MAKAPU‘U AHUPUA‘A, HĀMĀKUALOA AND KO‘OLAU DISTRICTS, ISLAND OF MAUI - TMK: [2] 1-1-001:022, 023, 036, 042, 044, and 052, [2] 1-2-001:003, [2] 1-2-004:005, [2]-1-2-003:001 and 005, [2] 1-3-002:020 and 023, [2] 2-9-010:001, [2] 2-9-014:001, [2] 2-9-012:041, [2] 2-9-013:015, and Hāna Highway Right-of-Way – Revised April 2023

cc (via email):

Andrew Hirano, HDOT
Henry Kennedy, HDOT

Appendix G.

Public Involvement

HANA HIGHWAY BRIDGE IMPROVEMENTS

Public Meeting Record

Project:	Hana Highway Bridge Improvements Project
Subject:	Hana Public Informational Meeting #1
Date/Time:	Tuesday, March 05, 2019 at 5:00 pm
Location:	Hana Community Center (5091 Uakea Road, Hana, HI**)**
Attendees:	FHWA-CFLHD: Thomas Parker, Lisa Hemesath, Bonnie Klamerus HDOT: Robin Shishido HDR: Sandy Beazley, Tammy Heffron Munekiyo Hiraga: Charlene Shibuya Winterton Consulting: Nicole Winterton Public/Agency: Approximately 18 attendees (see project file)

Meeting Purpose: To provide an overview of the project scope, partner agencies, project development process, and project background, and obtain early input from the community on issues and considerations relevant to the project.

Meeting Minutes:

Project Presentation: A project presentation was provided by Thomas Parker of FHWA-CFLHD and Tammy Heffron and Sandy Beazley of HDR (*project presentation in project file*).

Open Question/Answer and Input Shared Verbally in Meeting

1. **Question:** Will the bridges all be constructed at the same time or one by one?
   Response: This has not been determined, but it will be part of our analysis. It will be a balance of what is most efficient and cost effective and what will limit impacts to motorists.

2. **Question/Comment:** Will the road be shut down? And for how long? We use this road daily, so shutdowns are disruptive and need to be communicated in advance. The road is important for access and businesses.
   Response: This has not been determined, but it will be part of our analysis. Different improvements will result in different traffic control needs. Knowing the importance of the route, from both the community and tourist perspective, as well as emergency access.

3. **Question:** How is the project funded?
   Response: The project is federally funded. FHWA provides 80% of the funding, with HDOT providing a 20% match.

4. **Question/Comment:** Do we need to meet all federal standards? Other projects have required wider bridges and we do not want wider bridges.
   Response: FHWA CFLHD has constructed bridges elsewhere in Hawaii and maintained single lane bridges. As noted in the Preservation Plan, there is a goal of a 16-foot width, which is where we will start. Bridge #2 is 20-feet, we would likely keep this width as opposed to making the bridge narrower.

5. **Comment:** These bridges are 100 years old and still functioning. Please build and/or repair to a high standard to get a long life out of the bridges.
   Response: The goal with new construction is a new bridge should have a 75-year life. Rehabilitation depends on the condition of the bridge and what can be done. It could be 15 years or another 25 years. These lifecycles are one of the considerations.

6. **Comment:** The bridge name and date should be posted on the bridge. The correct names of the bridges need to be verified. There is an alternative name for Bridge #19 (Puohokamoa) and maybe one for Bridge #39 (Ulaino).
   Response: It is our plan to put the bridge name on the bridges. This is consistent with other FHWA-CFLHD bridge projects in Hawaii.

7. **Comment:** There are drainage issues on some of the bridges. It is great you are here during a rainy time so that you can see the issues that affect the road and bridges. Bridge #19 often has standing water on it. It seems that open railing is better for passing water. It is important to talk to maintenance staff to understand issues.
   Response: We saw that ponding today. The bridge is the low point and one of the options we discussed was how to raise that area to keep water from draining to it, or how to create a solution that will drain the bridge deck and be easy to maintain.

8. **Question:** Do you have traffic counts? There has been a surge in tourism in the last 5 years.
   Response: There are traffic counts in the Preservation Plan and we are working with HDOT to obtain updated traffic counts.

9. **Question:** Are there crash tested rail for 35-mph?
   Response: Yes, there are.

10. **Question:** During the Preservation Plan we were told that you couldn't reconstruct the bridges to look like the existing? Is this true?
    Response: All options are on the table and will be evaluated by the project team.

11. **Comment:** Tourists park everywhere, jump guardrails, hold up traffic, create long queues, and create dangerous situations. Emergency services are spread thin, and safety issues from tourists on route burdens these services and reduces the safety and security of the local community. Approaches of bridges should be considered. Don't create pullouts to encourage people to pull over. Don't add or eliminate pullouts.

Response: We are limited in what can be addressed with this project. There is an opportunity that pull outs adjacent to bridges can be removed or made safer.

12. **Comment:** What is the prioritization of considerations – culture and character?
    Response: This will be part of the project development.

13. **Comment:** Bridge # 39 and Bridge #40 drain into an important estuary for fish.
    Response: Thank you for the information. This is well beyond the area of direct impacts, but it is downstream of the project area. There are numerous mitigations and requirements to minimize and/or eliminate the potential of any release to the streams that would affect downstream areas.

14. **Comment:** At Bridge #40, the roadway has overtopped in the past, resulting in flooding at a residence, with water flowing beneath the existing home. HDOT made improvements in the area and this has not happened since. Please do not make any changes that impact my parcel.
    Response: We are reviewing the hydraulic conditions at each location in an effort to eliminate adverse effects to downstream landowners.

15. **Comment:** Raising loads to 40 tons seems extreme. The traffic should be slowed down. There are other road limitations that need to be considered such as the limits of cantilevered structures elsewhere on the route. During the Preservation Plan the community said they didn't want 40 tons and it was put in anyway. Larger vehicles can't make turns so why make the bridges able to handle heavier, larger vehicles?
    Response: The design team will look at the loads necessary to serve the community as part of their analysis.

16. **Comment:** Put yourself in the local's perspective, take your time and design it right. A recent county bridge project was narrowed with wrong approach curvature and now some vehicles can't make the turn.
    Response: The project team will seek to develop a quality design that will be reviewed by several engineers on the project team, FHWA, and HDOT. Designs will also be presented at future meetings for local input.

End of Meeting

HANA HIGHWAY BRIDGE IMPROVEMENTS

Public Meeting Record

Project:	Hana Highway Bridge Improvements Project
Subject:	Wailuku Public Informational Meeting #1
Date/Time:	Wednesday, March 06, 2019 at 5:30 pm
Location:	Cameron Center (95 Mahalani Street, Wailuku, HI**)**
Attendees:	FHWA-CFLHD: Thomas Parker, Lisa Hemesath, Mike Will, Bonnie Klamerus HDOT: Robin Shishido, Freddy Gutierrez, Freddy Gutierrez, Alan Matsudo HDR: Sandy Beazley, Tammy Heffron Munekiyo Hiraga: Charlene Shibuya Winterton Consulting: Nicole Winterton Public/Agency: Approximately 8 attendees (see project file)

Meeting Purpose: To provide an overview of the project scope, partner agencies, project development process, and project background, and obtain early input from the community on issues and considerations relevant to the project.

Meeting Minutes:

Project Presentation: A project presentation was provided by Thomas Parker of FHWA-CFLHD and Tammy Heffron and Sandy Beazley of HDR (*project presentation in project file*).

Open Question/Answer and Input Shared Verbally in Meeting

1. **Question:** Was the Hana Highway every officially surveyed for right-of-way? Does it encroach on private lands?
   Response: That's unknown, but we'll be researching that as we move forward.

2. **Question:** Would you have to close the road during construction?
   Response: Construction approach and closures are unknown and will be studied. This is an important consideration for this project. It is likely that some sort of closure will be needed. Different techniques will be considered such as accelerated bridge construction, using materials or approach to lessen roadway closures.

3. **Comment:** A good resource is the County Public Works. You should take advantage of their knowledge. They replaced four bridges and used temporary bridges. One is just past Hana.

4. **Comment:** A legal battle is ongoing with EMI. They have had detrimental impacts to the environment and it continues. To do environmental impact analysis on this project is ironic because of the ongoing EMI impacts are so much greater.

5. **Question:** How do you calculate the velocity of stream flow?
   Response: Hydrologic and hydraulic studies will be done.

6. **Question:** Can the bridges support 10 tons?
   Response: Engineering analysis and inspections are done by the state and the load rating is developed.

7. **Question:** How does faster bridge construction (ABC construction) help?
   Response: You look at different techniques to construction that minimize closures, and it is highly dependent on bridge and potential solution. For example, are there opportunities for night work, can you use faster setting materials, timing of work, etc. We've heard from other community members that maintaining access is important.

8. **Comment:** It seems it would be cheaper to improve the backside access, then close the road and fix the bridges. A lot of people in Hana do take the back road and it would be a lot cheaper.

9. **Comment:** With construction you have to think about the whole road. Ironically, a whole part of Hana Hwy may fall into the ocean. A resident owns property between two of the bridges so if construction done at the same time, access would be cut off. The rainy season should be avoided during construction because that will prolong construction. Also think about that all the food that goes into Hana is by truck.

10. **Comment:** Engineering methods on mainland can't be done out here. Concrete trucks can't be loaded. Construction loads are taken out and transferred to smaller vehicles. The curves affect the length of equipment. Contractors run into trouble when there are rainouts.

11. **Comment:** Consider that some people in Hana will be happy if the road is closed.

12. **Comment:** Right-of-way may be an issue. The problem with land ownership in Hawaii is that a long time ago there weren't the requirements there are now.

13. **Comment:** When you build the bridges, it should be embossed on the bridge. Not a sign because those get stolen. Make sure you have the right spelling with the correct diacritical marks. Check with University of Hawaii from people who teach the language. This is important because local people go by names of streams for purposes of direction, which is different from the mainland. 1930s maps are usually correct.

14. **Question/Comment:** What's happened in the past is federal standards have been forced on the community. Will those standards have to be applied? Also, the last project they put required signs up that impeded views. Please consider this in design.

Response: The design process will assess standards and evaluate what is appropriate for the route. For instance, what is the standard and does it make sense? What size vehicle do we need to model? What does community need?

15. **Comment:** The project team should contact Maui Tomorrow and Native HI Legal Counsel. They are actively involved in EMI issues.

16. **Comment:** Consider bringing in supplies into Hana Bay or even by helicopter.

End of Meeting

HANA HIGHWAY
BRIDGE IMPROVEMENTS

Public Meeting Record

Project:	Hana Highway Bridge Improvements Project
Subject:	Keanae Community Meeting #1
Date/Time:	Thursday, March 07, 2019 at 5:00 pm
Location:	Keanae Congregational Church on Keanae peninsula (13705 Hana Hwy, Keanae, HI**)**
Attendees:	FHWA-CFLHD: Thomas Parker, Lisa Hemesath, Mike Will HDOT: Robin Shishido, Freddy Gutierrez HDR: Sandy Beazley, Tammy Heffron Munekiyo Hiraga: Charlene Shibuya Winterton Consulting: Nicole Winterton Public/Agency: Approximately 7 attendees (see project file)

Meeting Purpose:

To provide an overview of the project scope, partner agencies, project development process, and project background, and obtain early input from the community on issues and considerations relevant to the project.

Meeting Minutes:

Project Presentation: A project presentation was provided by Thomas Parker of FHWA-CFLHD and Tammy Heffron and Sandy Beazley of HDR (*project presentation in project file*).

Open Question/Answer and Input Shared Verbally in Meeting

1. **Question:** Is information on the website? It doesn't have much information on it. Is the Preservation Plan posted?
   Response: The presentation was just uploaded yesterday, and the website will be continually updated as the project progresses. HDOT stated that they can post the Preservation Plan on their website.

2. **Question/Comment:** Who chose the bridges for the project? An important bridge was missed, which is Waikamoi Stream Bridge (Bridge #7) located right before Puohokamoa. It appears to be the bridge in the worst condition. It also floods on the deck and there is exposed rebar.
   Response: HDOT selected the bridges programmed for this project and they were selected on their condition and load rating.

3. **Question/Comment:** Will the bridges remain single lane? I strongly support one lane as a safety measure to slow traffic. There's rarely an accident "at" the bridge; there are several along roadway however.

Response: It is the project's intent for the bridges to remain one lane. The character was recognized as an important project consideration.

4. **Question:** Is the intent of load increases to bring in new uses?
   Response: The intent is not to change the use of the road but to accommodate loaded design vehicles (such as fuel, water, and food trucks) and to also facilitate construction to keep the road open (such as access for construction equipment in the event of landslides, roadway failures, bridge repairs).

5. **Question:** Can the bridges support 10 tons?
   Response: Engineering analysis and inspections are done by the state and the load rating is developed.

6. **Comment:** I support single lane but would appreciate a couple of extra feet of width at the approaches.

7. **Comment:** Take out parking areas at the bridges.

8. **Question:** What kind of closures are needed?
   Response: Closures are unknown at this time, and all construction approaches will be evaluated. Constructability and traffic impacts are an important consideration. To be studied are factors such as construction alternatives, accelerated bridge construction option, material options, temporary bridges, access, etc.

9. **Comment:** Having a phone number (with live person that can be reached) and website with up to the minute construction information is important (even in instances where construction is rained out for a day.

10. **Comment:** Can the old bridges be left in place and build new ones to the side?

    Response: This alternative will be investigated.

11. **Comment:** It would be nice if new bridges looked like the old.

12. **Comment:** If a couple of bridges needed to be two-lane it's not that bad as long as many are still one-lane.

13. **Comment:** The Preservation Plan discusses the EMI as a wonderful resource. For locals it has been destructive. If the report discusses the good, it should also discuss the bad, otherwise it should not be discussed at all.

14. **Comment:** It all comes down to the aesthetics of the bridges. The new bridge by the county did not work out very well.

15. **Comment:** Coordination of all on-going construction along the route is extremely important. It's very stressful with all the constant construction.

16. **Comment:** When asked by the project team if the community liked this meeting location they said it works, but the Keanae school is a better meeting spot. Email is a good communication method.

End of Meeting

HANA HIGHWAY
BRIDGE IMPROVEMENTS

Public Meeting Record

Project:	Hana Highway Bridge Improvements Project
Subject:	Hana Public Informational Meeting #2
Date/Time:	Tuesday, January 14, 2020 5:00pm, Hana Wednesday, January 15, 2020, 5 PM, Keanae Thursday, January 16, 2020, 5 PM, Paia
Locations:	Hana Community Center, 5091 Uakea Road Keanae Congregational Church, Keanae Peninsula Paia Community Center, Hana Highway
Attendees:	FHWA-CFLHD: Mike Will, Lisa Hemesath HDOT: Robin Shishido HDR: Sandy Beazley, Tammy Heffron, Sean Oroho Munekiyo Hiraga: Charlene Shibuya Winterton Consulting: Nicole Winterton Public/Agency Attendees • Hana: 11 attendees (10 signed in) • Keanae: 5 attendees • Paia:6 attendees

Meeting Purpose: The second in a series of meetings, the goal of these meeting was to provide a project update and gather public input on the purpose and need, design considerations, and preliminary alternative concepts. In addition, it provided a forum for questions and answers with the project team.

Meeting Summary:

Project Presentation: A project presentation was provided by Mike Will of FHWA-CFLHD and Tammy Heffron, Sandy Beazley, and Sean Oroho of HDR (*project presentation in project file*).

Major Themes: Following are the major themes or comments that were received at all three meetings. This is meant as a summary encapsulating input gathered; the specific comments received at each can be found further below in "Meeting Specific Comments".

- Traffic impacts
    - Every community had concerns about roadway closures. Daytime closures would impact tourists, thereby impacting the local economy, as well as residents commuting to and from school, jobs, and commercial areas. Night-time closures should be timed so that people who commute along Hana Highway at early morning and late evening hours can be accommodated. Emergency services require passage throughout the corridor. Daytime delays should be kept to a minimum.

- Aesthetics
    - A preference for an eye-pleasing design was stated by many people, with a solution that best matched the existing roadway and bridges.
    - There was a strong negative reaction to the double railing concept, except for one community member who preferred it for its ability to preserve the historic rails. Negative feedback was on aesthetics, as well as safety concerns.
- Reliability/Durability
    - Community members want a long-lasting solution. They see the challenges of maintaining the roadway, so they want a fix that lasts and provides reliability for future generations.
- Natural Resources
    - The streams are important to community members, especially since many of them are flowing more regularly as a result of reduced EMI water diversions. Minimize impacts to streams and aquatic resources.
    - Minimize tree removal.
- Development
    - The further east along Hana Highway the more common this refrain was – a solution should not allow for increased development potential. The feedback focused primarily on load rating of bridges, with limited additional input on minimizing any bridge widening.

Meeting Specific Comments: Following is a summary of the verbal comments received at each meeting.

Hana Meeting

1. **Question/Comment:** What is load rating for the bridges?
   Response: The design criteria is 40 tons, which is consistent with the Preservation Plan and the direction for the HDOT State Bridge Engineer. The route would not have to be posted for a 40-ton limit.

2. **Question/Comment:** Can you see through the railing of the replacement bridge?
   Response: Yes, although the picket openings are smaller.

3. **Question/Comment:** There is flooding and ponding on some bridges.
   Response: Yes there is, and our hydraulic analysis has showed the same issue. Bridge #39 and bridge #40 are in the 100-year floodplain and we have heard from one landowner that the water overtops the roadway and runs across the property. There are also drainage issues, where the bridge is the low point and collects water. The project is looking for solutions to both of these issues.

4. **Question/Comment:** Taller bridge railings make it harder to see cars on the bridges.
   Response: Thank you for that input.

5. **Question/Comment:** Can the irrigation features remain on bridge #19?
   Response: Maybe, but it depends on a variety of factors, which includes proposed improvements to the bridge, as well as what EMI may need for their operations, as well as input from SHPD and other stakeholders.

6. **Question/Comment:** Why do we need to make the bridges 16 feet wide? Wouldn't that cost a lot of money to widen them just a little?
   Response: The 16 feet matches what was proposed in the Preservation Plan. The Preservation Plan did note an exception to that, bridge #19.

7. **Question/Comment:** How do you determine if a bridge rehabilitation is a girder or slab bridge?
   Response: We will match the existing bridge type, and this project includes both girder and slab bridges.

8. **Question/Comment:** The double railing concept creates a "jungle gym" for tourists to play on.
   Response: A person could step on or over the new railing.

9. **Question/Comment:** If you don't need to make the bridges too wide, then don't. It's important to slow down the traffic.
   Response: Thank you for the comment.

10. **Question/Comment:** The double railing concept is "ugly". It does not maintain the existing look of the bridges.
    Response: Thank you for the comment, input on the various alternative concepts is what we are looking to hear at these meetings.

11. **Question/Comment:** The bridges have lasted generations, anything that we replace it with needs to last as long.
    Response: One of the project goals is a 75-year service life for the bridge.

12. **Question/Comment:** We do not want the Hana Highway to become a conduit for development. This is why the load limit on the bridge is important. Hana is a sacred place, a community that looks out for each other.
    Response: Even if all the bridges are can carry a 40-ton capacity, the road does not need to be posted as such. Also, the nature of the Hana Highway, limits the size of trucks that can travel it.

13. **Question/Comment:** Will the road on bridges be concrete or pavement.
    Response: Currently we are analyzing both options. HDOT has a preference of a concrete deck.

14. **Question/Comment:** Roadway runoff affects the water quality in the streams.

Response: The pavement itself should not shed contaminants, but you are correct, things like oil that has dripped off vehicles can enter streams. Ideally, drainage improvements will result in water draining into roadside ditches as opposed to off the bridges and directly into streams.

15. **Question/Comment:** Will the bridge approaches be improved?
    Response: Yes, although the focus is on the bridge so improvements to the roadway will be fairly limited. We want to have a smooth transition from the road to the bridge and also address any immediately adjacent drainage issues.

Keanae Meeting

1. **Question/Comment:** I am glad to see a rail option other than just the double rail that was shown in the Preservation Plan.
   Response: Thank you for the comment

2. **Question/Comment:** Tourists will climb on the new steel rail.
   Response: They might, and we heard the same concern in Hana last night.

3. **Question/Comment:** The beauty of the bridges must be maintained.

4. **Question/Comment:** What is the construction timing? These need to be built quickly so as to maintain access and connectivity.
   Response: A construction schedule has not yet been determined.

5. **Question/Comment:** Can the bridges be made slightly wider for trucks?
   Response: The goal is a 16-foot width, which is consistent with Preservation Plan and other HDOT single lane bridges.

6. **Question/Comment:** Are you planning on daytime closures? I am not sure this would work because people have jobs to get to and kids need to go to school. How long will a closure be? We can plan around a 20- or 30- minute closure, but I recently saw tourist get in a fight on the side of the road when there was a short delay because of a fallen tree.
   Response: A construction schedule has not yet been determined.

7. **Question/Comment:** There are people who commute across the island to work. The road would need to open at 4:00 AM and close at 8:00 PM to accommodate these people.

8. **Question/Comment:** Tourism is necessary, as businesses depend on it. I employ 7 people and my business will not make it if the road is closed during the day.

9. **Question/Comment:** What is the plan for emergencies?
   Response: Emergency access must be maintained, but how has not been determined yet.

10. **Question/Comment:** Some bridges overtop or have standing water on them, such as bridge #2.
    Response: That is something we've repeatedly heard, and it is consistent with some of our studies. We will consider this moving forward.

11. **Question/Comment:** You should have a survey for what type of roadway closure the community would prefer.
    Response: We will use future meetings to gain input on roadway closures and construction considerations.

12. **Question/Comment:** Will there be equipment working in the river? Will contaminants get into the stream? Some of these streams just started flowing again so it is important to not damage the streams. The locals will all be keeping a watch on the contractor during construction. If there is seasonal migration of fish, it will help if construction is timed to consider that.
    Response: Hopefully not, but that will depend on the improvements proposed at each bridge. We will try and minimize work in the streams. FHWA has a construction inspector on site who oversees construction operations and holds the contractor accountable for following standards, specifications, and the terms and conditions of permits.

13. **Question/Comment:** For future noticing, email select community members who can receive the information and they can share with neighbors and place on community bulletin boards.
    Response: Thank you (community members were then identified).

14. **Question/Comment:** If you replace a bridge the original construction date and the new construction date should be included. As kids, we used to drive across these bridges and recite the names of the bridges.
    Response: This is an idea that we have heard previously and is being considered.

15. **Question/Comment:** Will equipment be washed?
    Response: Yes, when equipment shows up on site it will have been washed to minimize the risk of invasive species being introduced.

16. **Question/Comment:** Some bridges overtop or have standing water on them.
    Response: That is something we've repeatedly heard, and it is consistent with some of our studies. We will consider this moving forward.

17. **Question/Comment:** The bridges do not need to handle 40 tons. There is no need for additional commerce. Also, there is no weigh station anymore, so no one knows the weight of the vehicles currently using the road.

Response: The structural design criteria established for the project follows federal and state requirements for the design loading of the bridge. However, there are alternatives to limit the type and weight of trucks that can use the bridges, such as load posting, or as was mentioned, weigh stations and/or enforcement of load restrictions.

Paia Meeting

1. **Question/Comment:** What other projects has CFLHD done on Maui? And on other islands?
   Response: Recently on Maui, CFLHD has worked on Haleakala and the Lahaina Bypass Phase 1B-2. On other islands CFLHD has worked on Saddle Road, in Hawaii Volcanoes National Park, and Hilea and Ninole Bridges on the Big Island, Hanapepe, Kapaa, Wainiha Bridges, and Bridge 7E on Kauai, and Roosevelt, Halona, Kawela, and Nanahu Bridges on Oahu.

2. **Question/Comment:** Traffic on Hana Highway has doubled in recent years.
   Response: Yes, and that is a something we have heard at our meetings earlier this week.

3. **Question/Comment:** Do the least amount possible from a safety perspective. Meaning maintain as much of the character of the route as possible.

4. **Question/Comment:** How do you determine which projects to work on.
   Response: For these bridges it was based on HDOT input regarding bridge inspections along the route. CFLHD and HDOT coordinate closely and consider a lot of factors on projects for the partnership program.

5. **Question/Comment:** Will the double railing narrow the road?
   Response: Yes, by approximately 3 feet (18 inches per side).

6. **Question/Comment:** The double rail would narrow up the bridge. Tourists walk on the road. Is it a safety concern?
   Response: It is crash-tested so not in that sense. But people may choose to stand on it or step over it. Plus, it is an area where debris can accumulate and it will require maintenance.

7. **Question/Comment:** The double railing is ugly? Is it cheaper?
   Response: Thank you for the comment; input on the various alternative concepts is what we are looking to hear at these meetings. There would be limited cost difference between a double rail or rail replacement.

8. **Question/Comment:** Integrity of the overall historic district is compromised when you replace bridges. The double railing preserves the original railing.
   Response: Thank you for the comment; input on the various alternative concepts is what we are looking to hear at these meetings.

9. **Question/Comment:** Are you looking at rehabilitation options for the railing?
   Response: No, there are no crash-tested rehabilitation options for the railing.

10. **Question/Comment:** Can the bridges be painted white? Why were they originally painted white?
    Response: Yes, they can be painted white, and were originally painted so they would be easier to see at night.

11. **Question/Comment:** Are all the railings being replaced?
    Response: We are still trying to determine this, but the Preservation Plan used the double railing concept on bridge #2 (both sides) and bridge #8 (just on one side) and otherwise identified replacement with a best match option.

12. **Question/Comment:** How can you build this while maintaining traffic?
    Response: We are looking at the use of detour bridges, temporary road closures, and accelerated bridge construction techniques.

13. **Question/Comment:** I would like to see a replacement with an aesthetic that matched the existing, but with greater reliability.
    Response: Thank you for your comment.

14. **Question/Comment:** How does the Preservation Plan relate to the project goals?
    Response: We are analyzing the concepts in the Preservation Plan and including them in the alternative analysis. As a result, they are undergoing additional engineering scrutiny, but are providing a starting point. Also, one of our five evaluation criteria pertain to historic character.

15. **Question/Comment:** Will you be revising FEMA floodplain maps?
    Response: The project would aim for no-rise at Bridges #39 and 40 so no map revisions are anticipated to be needed.

16. **Question/Comment:** When will the draft environmental documents be ready for review?
    Response: We hope to have a draft ready by summer of 2020.

17. **Question/Comment:** It is good to maintain the abutments and build behind them?
    Response: Thank you for the comment.

18. **Question/Comment:** Need to do a good job, there cannot be so many compromises that reliability is impacted.
    Response: We agree, especially given the number of structures along the route that will all require work at some point.

19. **Question/Comment:** There will always be construction along Hana Highway.

Response: Yes, between the number of bridges, the risk of landslides, and trees falling across the road there, construction along the roadway is common.

20. **Question/Comment:** Minimize the amount of tree removal. Remove trees that pose a threat to the bridges only.
    Response: That is our goal.

HANA HIGHWAY BRIDGE IMPROVEMENTS

Public Meeting Record

Project:	Hana Highway Bridge Improvements Project
Subject:	Hana Public Informational Meeting #3
Date/Time:	Tuesday, September 21, 2021, 5:30-7:00 pm HST Wednesday, September 22, 2021, 5:30-7:00 pm HST
Location:	Virtual via Zoom Link
Attendees:	FHWA-CFLHD: Tom Kubicz, Lisa Hemesath HDOT: Robin Shishido, Andrew Hirano HDR: Tammy Heffron, Sean Oroho, Sandy Beazley Winterton Consulting: Nicole Winterton Public/Agency: see attached, 25 attendees joined the Tuesday meeting and 20 joined the Wednesday meeting

Meeting Purpose:

To provide an overview of the alternatives evaluation, share the recommended alternative, and discuss bridge construction methods and potential traffic impacts.

Meeting Minutes:

Project Presentation: A project presentation was provided by the project team, including Tom Kubicz, Tammy Heffron, Sean Oroho, and Sandy Beazley (*project presentation in project file*).

Open Question/Answer and Input Shared during the Meeting

1. **Question:** Will the bridges all be constructed at the same time or one by one?
   Response: This has not been determined, but it will be part of our analysis. It will be a balance of what is most efficient and cost effective and what will limit impacts to motorists.

2. **Question/Comment:** Will the turning radius remain the same?
   Response: For 5 of the bridges, yes. Since the Kopiliula Stream Bridge is a new bridge the turning radius will differ slightly, but would not be a sharper turn than current turn onto the existing bridge.

3. **Question:** What is longest continuous closure you anticipate?
   Response: To slide in the new bridge requires a full roadway closure because the existing bridge needs to be removed and the new bridge slid into place. We would anticipate that being completed in four days or less.

4. **Question/Comment:** Will the new bridges have a higher load rating.

Response: Yes, the new bridges will be designed to accommodate 40 tons.

5. **Comment:** What is the permitting process?
   Response: It is possible that 5 of 6 bridges will likely have a streamlined permitting process, as there may be no work in the streams. The Kopiliula Stream Bridge will require instream work, so we anticipated that bridge requiring a Section 404 permit. All 6 bridges do require National Historic Preservation Act and Endangered Species Act compliance. Coordination with SHPD and USFWS is ongoing.

6. **Comment:** How is this going to impact the environment?
   Response: With a majority of bridges maintaining their current alignment we are able to minimize environmental impacts. There would be instream work at one location and there would be vegetation removal in the areas immediately adjacent to the bridge. Vegetation impacts would be temporary. A minor increase in impervious surface would result in a small amount of additional runoff entering the streams.

7. **Comment:** Could you color the concrete to provide a better match "aged" appearance?
   Response: This has not yet been considered, but is an option that could be explored. Given the environmental conditions, largely the heat, high humidity, and heavy rainfall, it is anticipated that the new bridges will be stained and portions covered in vegetation within the first few years of operation.

8. **Question:** Will the contractor have any specific conditions imposed as part of the bidding process?
   Response: The specifics of the contract have yet to be determined, but a qualified contractor will be required to deliver the project.

9. **Question:** Will the existing Kopiliula Stream Bridge be open to pedestrians?
   Response: This has not been determined, but is unlikely as the existing bridge does not meet safety standards for pedestrians. However, access will need to be maintained so that EMI can continue to perform maintenance on canal infrastructure.

10. **Comment:** Constructing more than one bridge at a time could be a challenge for residents if they happen to live between the two or more bridges being constructed concurrently.
    Response: During final design a plan will be developed to maintain traffic for local and regional travelers.

11. **Comment:** On other construction projects there were time zones (work windows) when the road was closed. That would help locals know when they could and could not drive the highway.
    Response: Road closures will be scheduled and communicated so that community members can plan accordingly.

12. **Comment:** Future outreach should leverage Facebook since there are multiple Facebook groups specific to Hana.
    Response: We will coordinate with Dawn Lono for notifications to be included in Facebook for the next round of public meetings.

13. **Comment:** Looks good so far, wish the work could start ASAP.
    Response: n/a

14. **Comment:** Thank you keeping the columns (piers).
    Response: n/a

End of Meeting