

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Forestry and Wildlife
Honolulu, Hawaii 96813

March 22, 2019

Chairperson and Members
Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

Land Board Members:

**SUBJECT: REQUEST APPROVAL OF THE MDHE LLC FOREST STEWARDSHIP
MANAGEMENT PLAN AND FOREST STEWARDSHIP AGREEMENT
WITH MDHE LLC, TMK (1) 4-2-004:001, KAILUA, KO‘OLAUPOKO,
ISLAND OF O‘AHU**

BACKGROUND

The State of Hawai‘i Forest Stewardship Program (FSP) provides technical and financial assistance to private landowners and land managers committed to the stewardship, conservation, and restoration of important forest resources across the state. These private properties provide a variety of public benefits for the residents of Hawai‘i, including but not limited to: fresh water capture and production, decreased soil erosion, wildlife habitat, forest products, recreational and educational opportunities, and local jobs. The assistance provided by FSP enables private landowners to develop and implement long-term multi-resource management plans to conserve, restore and maintain forested areas on their property.

The FSP was established through Chapter 195F-6, Hawai‘i Revised Statutes (HRS) and provides the Department of Land and Natural Resources with the authority to provide financial assistance to approved Forest Stewardship projects for private landowners to manage, protect, and restore important natural resources on forested and formerly forested properties. The FSP is implemented pursuant to Chapter 195F, HRS, and Section 109, Hawai‘i Administrative Rules (HAR). The program provides cost-share reimbursement for the development of long-term forest management plans and for the implementation of approved Forest Stewardship management plans.

To participate in FSP, interested landowners and managers follow a sequence of application steps in the process of developing a long-term Forest Stewardship management plan. All interested landowners submit their proposed project for review by the Forest Stewardship Advisory Committee (FSAC). The FSAC reviews the proposed project based on program eligibility requirements and assures the proposed project is in line with the program’s goals of conservation, restoration, and/or forest production. Once a proposed project is accepted, the FSAC recommends the development of a FSP management plan and reviews and approves the final management plan. The Forest Stewardship

management plan is created by landowners in partnership with natural resource professional/experts and reviewed and approved by both the Division and the FSAC. Final management plans are then recommended for approval by the Department.

The award of cost-share support for Forest Stewardship management plan implementation follows a similar process to the development of a management plan. Upon approval of a project's Forest stewardship management plan, the FSAC reviews the implementation schedule and budget summary to ensure that the practice costs are reasonable and follow the program's approved cost-share rates. The FSAC recommends cost share support for the project implementation based on the 10-year implementation schedule that is submitted to the Board of Land and Natural Resources (Board) for consideration. Review and approval of the Forest Stewardship project and management plan, as well as authorization of cost-share support for the project by the Board is required for the Department to enter into the Forest Stewardship Agreement. The Division has previously worked with the Department of the Attorney General to develop a Forest Stewardship Agreement template (Exhibit A) for eligible projects.

The MDHE LLC Forest Stewardship project proposes to manage and restore a 6-acre portion of Tax Map Key number (1) 4-2-004:001 (36.89 acres), in the Ko'olaupoko District of Honolulu County. This project proposes to restore a non-native landscape to a native lowland forest. The Forest Stewardship project area is designated by the State of Hawai'i as both Conservation District and Urban District, and as General Preservation District by the County of Honolulu. The MDHE LLC project is in the town of Kailua on the east side of the Ko'olau mountain range. The property is adjacent to the Kailua Bluffs and Keolu Summit communities, and Bellows Marine Corps Training Area.

Historically, the vegetation at this site was likely lowland mesic forest and shrubland dominated by 'ōhi'a, koai'a, and a'ali'i. Prior to the current owners, the land was used for grazing cattle. The property is characterized as having an almost entirely non-native invasive species, where native species only account for 3% of the vegetation. The specific goals of this FSP project are to restore the area to a native dominated lowland forest with native and agroforestry plants.

The FSAC approved the MDHE LLC Forest Stewardship management plan at their meeting on January 20, 2017 and the State Forester/Division Administrator approved the Forest Stewardship management plan on March 30, 2017 (Exhibit B).

The Forest Stewardship management plan is one component of a larger project previously considered and approved by the Board in October 26, 2018 under Conservation District Use Application (CDUA) OA-3818. The CDUA was for a single-family residence, drainage culverts, fencing of 6-acres, a cleared firebreak, forest restoration, parking and turnaround area, subsistence "garden" with associated irrigation, soil amendments, and plant establishment, rain catchment, retaining walls, and landscaping around the single-family residence.

DISCUSSION

The Division is requesting approval of a Forest Stewardship Agreement with MDHE LLC for the

implementation of the MDHE LLC Forest Stewardship management plan. Over the course of the 10-year management plan, the landowner intends to restore the native forest in the project area by restoring 0.6 acres every year (Exhibit B). The project area is dominated primarily by non-native vegetation consisting of formosan koa (*Acacia confusa*), koa haole (*Leucaena leucocephala*), and Guinea grass (*Megathyrsus maximus*). The understory of the project area is considered less dense and more favorable for planting than the rest of the property. Management approaches will focus on the exclusion of ungulates, removal of non-native brush, and the establishment of native species.

The first management activity will be the installation of an ungulate proof fence along the perimeter of the project area and the removal of pigs. Planting areas will then be prepared by removing invasive species using mechanical methods. Individual holes for seedlings will be dug immediately before planting using a pick axe or auger. Native tree species such as koa (*Acacia koa*) and 'ōhi'a (*Metrosideros polymorpha*) will be planted in a grid system, with native shrub and ground cover species planted irregularly throughout to mimic a natural setting. Fertilizer will be distributed around the seedling to assist with growth and development. Irrigation will also be used to help with seedling survival until they become established. Mulching will be used to suppress weed competition prior to and after planting. Ongoing maintenance such as weed control will be done on a regular basis after the initial planting until the native canopy closes. Pigs will be controlled by ongoing hunting, trapping, removal, and monitoring. Monitoring activities will include annual quantitative assessments of seedling survival.

A total of **\$55,326** in state Forest Stewardship funding is requested to provide cost-share support for the MDHE LLC Forest Stewardship management plan and the MDHE LLC Forest Stewardship Agreement over a ten-year period. MDHE LLC will be contributing an equal amount of **\$55,326** towards project implementation. The costs associated with the proposed management practices described in the plan are consistent with management costs for similar types of FSP projects. Cost-share funds are provided as reimbursement payments for implementation of approved management practices through the State fiscal year 2029.

CHAPTER 343 – ENVIRONMENTAL COMPLIANCE

The subject FSP project was a component of a larger project considered under the approved CDUA and environmental assessment process. A notice of a Finding of No Significant Impact (FONSI) for the larger project (1711 Kanapu'u Drive Residence and Stewardship) Final Environmental Assessment (FEA) was published in the September 23, 2018 issue of the OEQC publication the Environmental Notice.

RECOMMENDATION


That the Board:

1. Approve the MDHE LLC Forest Stewardship management plan;
2. Approve cost-share support in the amount of **\$55,326** for the implementation of the

MDHE LLC Forest Stewardship management plan;

3. Authorize the Chairperson to amend, finalize and execute a Forest Stewardship Agreement with MDHE LLC to participate in the State Forest Stewardship Program subject to the following:
 - A. Availability of State Forest Stewardship funds; and
 - B. Review and approval as to form of the Forest Stewardship Agreement by the Department of the Attorney General.

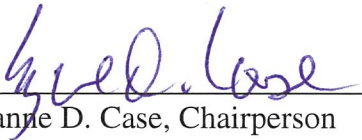
Respectfully submitted,



David G. Smith, Administrator
Division of Forestry and Wildlife

Attachment: (Exhibit A, B)

APPROVED FOR SUBMITTAL:



Suzanne D. Case, Chairperson

**STATE OF HAWAII
FOREST STEWARDSHIP AGREEMENT**

This AGREEMENT, made this _____ day of _____
_____, 20____, by and between the BOARD OF LAND AND NATURAL
RESOURCES, STATE OF HAWAII (“STATE”), by its Chairperson, whose address is
1151 Punchbowl Street, Honolulu, Hawaii 96813, and _____ (“LANDOWNER”)
whose address and federal and state taxpayer identification numbers are as follows: _____

Business address

*Federal and state taxpayer identification
numbers*

RECITALS

WHEREAS, Chapter 195F, Hawaii Revised Statutes (HRS), provides for the establishment of a forest stewardship program to encourage and assist private landowners in managing, protecting, and restoring important watersheds, native vegetation, fish and wildlife habitats, isolated populations of rare and endangered plants, and other forest lands that are not recognized as potential natural area reserves; and

WHEREAS, in accordance with HRS Chapter 195F and Title 13, Subtitle 5, Part 1, Chapter 109 of the Hawaii Administrative Rules (HAR), the LANDOWNER has applied, and qualifies, for participation in the forest stewardship program; and

WHEREAS, the LANDOWNER has submitted a forest stewardship management plan, as set forth in Exhibit A hereto, that the STATE agrees is consistent with the policies, goals, and objectives of the forest stewardship program; and

WHEREAS, the STATE desires to assist the LANDOWNER in implementing the forest stewardship management plan with financial and other assistance; and

WHEREAS, money is available to fund this agreement pursuant to: Act 195, SLH 1993, Hawaii Revised Statutes, Section 247-7.

NOW, THEREFORE, in consideration of the promises contained in this AGREEMENT, the STATE and the LANDOWNER agree as follows:

A. SCOPE OF SERVICES

The LANDOWNER hereby agrees to implement the forest stewardship management plan set forth in Exhibit A and the project described in the “Scope of Services” set forth in Attachment S1 in proper and satisfactory manner as determined by the STATE, both of which are hereby made a part of this AGREEMENT. The STATE hereby agrees to assist the LANDOWNER in implementing the forest stewardship management plan, all in accordance with the terms and conditions set forth in Attachments S1, S2, S3, S4, S5, and S6, attached hereto.

B. COMPENSATION

The LANDOWNER shall be compensated for performance of the project under this AGREEMENT according to the “Compensation and Payment Schedule,” set forth in Attachment S2, which is hereby made a part of this Agreement.

C. TIME OF PERFORMANCE

The performance required of the LANDOWNER under this AGREEMENT shall be completed in accordance with the “Time of Performance” set forth in Attachment S3, which is hereby made a part of this AGREEMENT.

D. CERTIFICATE OF EXEMPTION FROM CIVIL SERVICE

The “State of Hawaii Certificate of Exemption from Civil Service,” set forth in Attachment S4, is hereby made a part of the AGREEMENT.

E. OTHER TERMS AND CONDITIONS

The “State of Hawaii Special and General Conditions for Forest Stewardship Program Agreements,” set forth in Attachment S5, and the General Conditions attached hereto, are hereby made a part of this AGREEMENT. For the purposes of this AGREEMENT the term “CONTRACTOR” in the “General Conditions” shall mean the LANDOWNER.

F. STANDARDS OF CONDUCT DECLARATION

The "Standards of Conduct Declaration" by LANDOWNER, set forth in Attachment S6, is hereby made a part of this AGREEMENT. For the purposes of this AGREEMENT the term "CONTRACTOR" in the "Standards of Conduct Declaration" shall mean the LANDOWNER.

IN WITNESS WHEREOF, the parties execute this AGREEMENT by their signatures to be effective as of the date first above written.

STATE

By _____
Chairperson of the Board of Land and Natural
Resources

Print Name

Date _____

LANDOWNER

By _____

Print Name

Date _____

Approved by the Board of
Land and Natural Resources on

APPROVED AS TO FORM:

Deputy Attorney General

LANDOWNER'S ACKNOWLEDGMENT

STATE OF HAWAII)
) SS.
COUNTY OF _____)

On this _____ day of _____, 20____, before me personally appeared _____, to me personally known, who being by me duly sworn, did say the he/she is the _____, the LANDOWNER named in the foregoing instrument, and the he/she is authorized to sign said instrument on behalf of the LANDOWNER, and acknowledges that he/she executed said instrument as the free act and deed of the LANDOWNER.

Notary Public, State of Hawaii

My Commission Expires: _____

Date of the Notarized Document: _____

Number of Pages: _____

Identification or Description of the Document being Notarized: _____

Printed Name of Notary: _____ Circuit

Notary's Signature and Notary's Official Stamp or Seal Date



STATE OF HAWAII
CONTRACTOR'S
STANDARDS OF CONDUCT DECLARATION

For the purposes of this declaration:

"Agency" means and includes the State, the legislature and its committees, all executive departments, boards, commissions, committees, bureaus, offices; and all independent commissions and other establishments of the state government but excluding the courts.

"Controlling interest" means an interest in a business or other undertaking which is sufficient in fact to control, whether the interest is greater or less than fifty per cent (50%).

"Employee" means any nominated, appointed, or elected officer or employee of the State, including members of boards, commissions, and committees, and employees under contract to the State or of the constitutional convention, but excluding legislators, delegates to the constitutional convention, justices, and judges. (Section 84-3, HRS).

On behalf of _____, CONTRACTOR, the undersigned does declare as follows:

1. CONTRACTOR is* is not a legislator or an employee or a business in which a legislator or an employee has a controlling interest. (Section 84-15(a), HRS).
2. CONTRACTOR has not been represented or assisted personally in the matter by an individual who has been an employee of the agency awarding this Contract within the preceding two years and who participated while so employed in the matter with which the Contract is directly concerned. (Section 84-15(b), HRS).
3. CONTRACTOR has not been assisted or represented by a legislator or employee for a fee or other compensation to obtain this Contract and will not be assisted or represented by a legislator or employee for a fee or other compensation in the performance of this Contract, if the legislator or employee had been involved in the development or award of the Contract. (Section 84-14 (d), HRS).
4. CONTRACTOR has not been represented on matters related to this Contract, for a fee or other consideration by an individual who, within the past twelve (12) months, has been an agency employee, or in the case of the Legislature, a legislator, and participated while an employee or legislator on matters related to this Contract. (Sections 84-18(b) and (c), HRS).

CONTRACTOR understands that the Contract to which this document is attached is voidable on behalf of the STATE if this Contract was entered into in violation of any provision of chapter 84, Hawaii Revised Statutes, commonly referred to as the Code of Ethics, including the provisions which are the source of the declarations above. Additionally, any fee, compensation, gift, or profit received by any person as a result of a violation of the Code of Ethics may be recovered by the STATE.

* Reminder to Agency: If the "is" block is checked and if the Contract involves goods or services of a value in excess of \$10,000, the Contract must be awarded by competitive sealed bidding under section 103D-302, HRS, or a competitive sealed proposal under section 103D-303, HRS. Otherwise, the Agency may not award the Contract unless it posts a notice of its intent to award it and files a copy of the notice with the State Ethics Commission. (Section 84-15(a), HRS).

CONTRACTOR

By _____
(Signature)

Print Name _____

Print Title _____

Name of Contractor _____

Date _____



STATE OF HAWAII
SCOPE OF SERVICES

SECTION 1 - SCOPE OF WORK

- 1.1 MANAGEMENT AREA - The project area to be managed is the _____ Forest Stewardship project area; TMK NUMBER(S) _____ as designated on maps found in _____ to this AGREEMENT.
- 1.2 THE PRIMARY OBJECTIVES - The STATE and LANDOWNER shall direct their efforts under this AGREEMENT to do the following: fund the management of and manage the natural resources of the _____ Forest Stewardship project area (“Forest Stewardship project area”) in accordance with the MANAGEMENT PLAN, attached as _____ to this AGREEMENT, and all approved amendments thereto, with the intention of _____ in the _____ community.
- 1.3 SCOPE OF WORK - The LANDOWNER shall perform the following technical and professional services:
- (a) Management plan. The LANDOWNER shall carry out the management activities outlined in the approved MANAGEMENT PLAN, attached as _____ to this AGREEMENT.
 - (b) Consultation. The LANDOWNER shall be available for consultation regarding progress, upon request by the STATE.
- 1.4 AUTHORITY TO CARRY OUT MANAGEMENT PLAN - The LANDOWNER hereby represents that it has authority to carry out the MANAGEMENT PLAN and that it is the landowner of “Forest Stewardship project area” as defined in Section 195F-2, Hawaii Revised Statutes, as amended.
- 1.5 NO INCONSISTENT ACTIVITIES - The LANDOWNER shall not take any action on the “Forest Stewardship project area”, which will undermine or conflict with the approved MANAGEMENT PLAN.

II. SECTION 2 - CONTROL AND PROGRESS OF THE WORK



STATE OF HAWAII
SCOPE OF SERVICES

- 2.1 REPORTS - The LANDOWNER shall submit to the STATE, reports showing work accomplished at the following times:
- (a) Progress Reports. A progress report shall be due on December 31 of each year under this AGREEMENT for which funding has been approved. This report shall include a description of the approved MANAGEMENT PLAN accomplishments and activities, areas needing technical advice, an accounting of expenditures with documentation, and proposed modifications to the current year's management activities. This report shall be submitted to the STATE within 30 days following the due date. If the LANDOWNER would like more than 2 reimbursements per year, a progress report shall accompany each reimbursement request and the "Forest Stewardship project area" shall be made available for a site visit by Department of Land and Natural Resources personnel.
 - (b) Annual Report. An annual report shall be due on or before June 30 of each year under this AGREEMENT for which funding has been approved. In the event the contract is executed less than 6 months prior to June 30, then no annual report is due on June 30 of that year. This report shall include a description of MANAGEMENT PLAN accomplishments and activities, areas needing technical advice, and proposed modifications to the next year's approved management objectives, projects and budget. This report shall also include a detailed accounting of expenditures for the preceding 12-month period to provide the basis for the annual reconciliation of the STATE's and the LANDOWNER's respective shares of funding as determined pursuant to Attachment S2, Section 1.1. This report shall be submitted to the STATE within 60 days of due date. This report may also request, subject to approval by the STATE, changes to the management plan, for either or both the practice implementation schedule and/or the budget/payment schedule in order to best consolidate and rectify the past year's outcomes or lack thereof.



STATE OF HAWAII
SCOPE OF SERVICES

2.2 DELEGATION OF AUTHORITY - As used herein and throughout this AGREEMENT, unless the context clearly indicates otherwise, the STATE shall include the State of Hawaii Department of Land and Natural Resources and its authorized employees, agents and representatives.



STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SECTION 1 – PAYMENT

1.1 SCOPE OF PAYMENT -

- (a) STATE's Payment. In full satisfaction of the STATE's funding share of the approved MANAGEMENT PLAN, which is contingent upon satisfactory completion by the LANDOWNER of the management activities described in the approved MANAGEMENT PLAN, attached as Exhibit A to this AGREEMENT, the STATE agrees to pay the LANDOWNER a total sum not to exceed ____
____ 00/100 Dollars (\$ _____) according to the schedule outlined below that includes fiscal year 20XX through 20XX for completion of the management activities described in the approved MANAGEMENT PLAN. Payments shall be made by the STATE to the LANDOWNER as partial annual reimbursements for actual expenditures made by the LANDOWNER in completing the management activities described in the approved MANAGEMENT PLAN only after the corresponding progress or annual report has been reviewed by the STATE and all reported management activity accomplishments have been verified following an inspection of the “Forest Stewardship project area” by the STATE. Actual expenditures may include but are not limited to in-kind services such as heavy equipment operation and sources of labor. All funds to be paid by the STATE to the LANDOWNER shall be encumbered on an annual basis for the forthcoming fiscal year provided that the STATE has approved the continuation of management activities outlined in _____ of this AGREEMENT for the forthcoming fiscal year.

If in any fiscal year the allocated annual funds are not exhausted due to the LANDOWNER not completing all management activities described in the MANAGEMENT PLAN for that year, the LANDOWNER may request that these funds be incorporated in the following year's encumbrances to complete the management activities which were not completed. If there are sufficient funds available to accommodate LANDOWNER's request and the STATE approves the



STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

request, this change will be incorporated by written amendment to the AGREEMENT.

If in any fiscal year the STATE does not appropriate, and/or the STATE does not approve the expenditure of, funds sufficient to meet the STATE's funding share of the approved MANAGEMENT PLAN, this AGREEMENT shall automatically terminate without penalty at the end of the last fiscal year for which any funds have been appropriated and approved, subject to Attachment S5, Section 4.1, regarding partial State funding.

- (b) LANDOWNER's Share. In full satisfaction of the LANDOWNER's funding share of the approved MANAGEMENT PLAN, the LANDOWNER agrees to fully complete the management activities described in the approved MANAGEMENT PLAN, and to initially assume all corresponding actual annual expenditures in expectation of the STATE's partial reimbursement for satisfactory completion of these management activities. Expenditures for implementation of the approved MANAGEMENT PLAN which are less than the amounts allocated in the approved budget may be made by the LANDOWNER in its discretion so long as the quality of materials and work as called for in the approved MANAGEMENT PLAN are not adversely affected.



STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

**PATRICK & SHEILA CONANT FOREST STEWARDSHIP
PROJECT BUDGET/PAYMENT SCHEDULE:**

YEAR	Total Budget	Land Owner share	State Share
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Total			

1.2 PAYMENT SCHEDULE –

- (a) Progress Payment. Within 30 days following receipt of the progress report as provided in Attachment S1, Section 2.1(a) for each year for which the STATE has agreed to pay the LANDOWNER as outlined in the schedule above and for which funding has been appropriated, the STATE shall pay to the LANDOWNER a portion of the STATE’s funding share of the approved MANAGEMENT PLAN as a partial reimbursement of actual expenditures made to complete approved management activities. This payment shall be subject to the LANDOWNER’s satisfactory completion of the corresponding approved management activities described in the approved MANAGEMENT PLAN, attached as Exhibit A to this AGREEMENT, and calculated on the basis of actual expenditures made by the LANDOWNER. This payment shall also be subject to the STATE’s approval of such progress report.

- (b) Annual/Final Payment. Within 30 days of receipt of the annual report as provided in Attachment S1, Section 2.1(b), the STATE shall pay to the LANDOWNER the balance of the STATE’s approved annual funding share. This payment shall be subject to the LANDOWNER’s satisfactory completion of the corresponding



STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

annual management activities described in the approved MANAGEMENT PLAN, attached as Exhibit A to this AGREEMENT, and calculated on the basis of actual expenditures made by the LANDOWNER.

- (1) Annual or Final Acceptance and Payment - Annual or final acceptance means a written notice from the STATE to the LANDOWNER advising the LANDOWNER of the satisfactory fulfillment of the AGREEMENT's annual or final requirements.

- 1.3 UNAUTHORIZED WORK - The LANDOWNER shall not receive matching STATE funds for management activities not designated in the approved MANAGEMENT PLAN. All work completed by the LANDOWNER prior to receipt of a fully-executed copy of this AGREEMENT, and prior to STATE approval of funding for any subsequent years and prior to STATE approval of any subsequent amendments to the approved MANAGEMENT PLAN, shall be at the LANDOWNER's own volition and risk, including work performed during the period of any deliberations by the STATE in anticipation of approval; provided, however, that if funding and/or amendments applicable to such work are subsequently approved, the LANDOWNER may be paid for such work even if performed prior to such approval.

SECTION 2 - FISCAL RECORDS MAINTENANCE, RETENTION, AND ACCESS

- 2.1 The LANDOWNER shall maintain, in accordance with generally acceptable accounting practices, fiscal records and supporting documents and related files, papers and reports that adequately reflect all direct and indirect expenditures and management and fiscal practices materially related to the LANDOWNER's performance of services paid for by State funds under this AGREEMENT.
 - (a) The STATE, the Comptroller of the State of Hawaii, and any of their authorized representatives, the committees (and their staff) of the Legislature of the State of Hawaii, and the Legislative Auditor of the State of Hawaii shall have the right of access to any book, document, paper, file, or other records of the LANDOWNER



STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

that is materially related to the performance by the LANDOWNER of services funded by the STATE under this AGREEMENT, in accordance with generally accepted audit procedures, for the purposes of monitoring and evaluating the LANDOWNER's performance of services and the LANDOWNER's management program and fiscal practices to assure the proper and effective expenditure of funds under this AGREEMENT; provided, however, that no party conducting any such audit or examination shall copy, distribute, or retain any of such information or records, with the understanding that it is not the intention that the LANDOWNER's financial and other records and information be made public.

- (b) The right of access shall not be limited to the required retention period but shall last as long as the records are retained. The LANDOWNER shall retain all records related to the LANDOWNER's performance of services funded under this AGREEMENT for at least 3 years after the date of submission of the LANDOWNER's annual reports for any designated period and payment for such expenditures by the STATE in accordance with its matching share, except that if any litigation, claim, negotiation, investigation, audit, or other action involving the records has been started before the expiration of the 3-year period, the LANDOWNER shall retain the records until completion of the action and resolution of all issues that arise from it or until the end of the regular 3-year retention period, whichever occurs later.



STATE OF HAWAII
TIME OF PERFORMANCE

SECTION 1 - EXECUTION OF AGREEMENT

- 1.1 EXECUTION OF AGREEMENT - This AGREEMENT shall be promptly executed by the STATE and the LANDOWNER upon approval by each party.
- 1.2 CERTIFICATION AND APPROVAL OF AGREEMENT - This AGREEMENT shall not be considered binding upon the STATE, unless the availability of the funds therefore has been duly certified as prescribed by Section 103-39, Hawaii Revised Statutes, as amended. Further, this AGREEMENT shall not be considered to be fully executed unless the Office of the Attorney General of the State of Hawaii has approved this AGREEMENT as to form.

SECTION 2 - TERM

- 2.1 INITIAL TERM - The initial term will be for a minimum of Thirteen (13) years following the completion of any and all management practices for which the LANDOWNER has received cost-share assistance. Accordingly, this AGREEMENT shall commence on the date of full execution hereof and shall be in effect until _____; subject, however to earlier termination as provided in this AGREEMENT.
- 2.2 STATE FUNDING CONDITION - This AGREEMENT is subject to continued funding of the STATE's share of the approved management budget as outlined in Attachment S2, Section 1.1. Annual funding is provided by the Conveyance Tax pursuant to Act 195, SLH 1993, Section 247-7, Hawaii Revised Statutes, whereby twenty-five percent of the amount collected from this tax shall be paid into the natural area reserve fund from which funds are dispersed to the natural area partnership and forest stewardship programs, and by way of Act 269, SLH 2000 to projects undertaken in accordance with watershed management plans. Payments are then made through the forest stewardship program to reimburse landowners for implementing approved stewardship management practices. Any balance remaining in this fund at the end of any fiscal year shall be carried forward



STATE OF HAWAII
TIME OF PERFORMANCE

into the fund for the next fiscal year. If in any fiscal year the STATE does not appropriate, and/or the STATE does not approve the expenditure of, funds sufficient to meet its share of the approved management budget, this AGREEMENT shall automatically terminate without penalty at the end of the last fiscal year for which any funds have been appropriated and approved, subject to Attachment S5, Section 4.1, regarding partial State funding.



STATE OF HAWAII

**CERTIFICATE OF EXEMPTION
FROM CIVIL SERVICE**

1. By Heads of Departments Delegated by the Director of the Department of Human Resources Development (“DHRD”).*

Pursuant to a delegation of the authority by the Director of DHRD, I certify that the services to be provided under this Contract, and the person(s) providing the services under this Contract are exempt from the civil service, pursuant to § 76-16, Hawaii Revised Statutes (HRS).

(Signature)

(Date)

(Print Name)

(Print Title)

* This part of the form may be used by all department heads and the heads of attached agencies to whom the Director of DHRD expressly has delegated authority to certify § 76-16, HRS, civil service exemptions. The specific paragraph(s) of § 76-16, HRS, upon which an exemption is based should be noted in the contract file. If an exemption is based on § 76-16(b)(15), the contract must meet the following conditions:

- (1) It involves the delivery of completed work or product by or during a specific time;
- (2) There is no employee-employer relationship; and
- (3) The authorized funding for the service is from other than the "A" or personal services cost element.

NOTE: Not all attached agencies have received a delegation under § 76-16(b)(15). If in doubt, attached agencies should check with the Director of DHRD prior to certifying an exemption under § 76-16(b)(15). Authority to certify exemptions under §§ 76-16(b)(2), and 76-16(b)(12), HRS, has not been delegated; only the Director of DHRD may certify §§ 76-16(b)(2), and 76-16(b)(12) exemptions.

2. By the Director of DHRD, State of Hawaii.

I certify that the services to be provided under this Contract, and the person(s) providing the services under this Contract are exempt from the civil service, pursuant to §76-16, HRS.

(Signature)

(Date)

(Print Name)

(Print Title, if designee of the Director of DHRD)



STATE OF HAWAII
SPECIAL CONDITIONS

SECTION 1 – INSPECTIONS

- 1.1 The STATE shall have the right to make inspections of the “Forest Stewardship project area” after prior notice to the LANDOWNER. In addition, the STATE shall be obligated to inspect the work on the “Forest Stewardship project area” not less frequently than once per year under this AGREEMENT, and more frequently in the case of a LANDOWNER default as provided in Section 4.1(d) below or when the LANDOWNER makes more than 2 reimbursement requests per year as provided in Attachment S1, Section 2.1. The STATE shall notify the LANDOWNER within a reasonable time thereafter of any perceived defaults in the LANDOWNER's implementation of the approved MANAGEMENT PLAN. The LANDOWNER hereby represents that it has authority to allow access to the “Forest Stewardship project area” by the STATE in connection with this AGREEMENT, conditional upon receipt of a liability waiver, acceptable to the LANDOWNER for all state personnel visiting the “Forest Stewardship project area”.

SECTION 2 - AMENDMENTS

- 2.1 The LANDOWNER may propose for approval by the STATE, and the STATE may approve, minor alterations to the approved MANAGEMENT PLAN, which will not have a material adverse impact on the achievement of the overall management objectives of the approved MANAGEMENT PLAN. This includes minor changes to the practice implementation schedule and/or changes in the budget/payments schedule so long as the total management activities do not subtract from or exceed the total scope of the approved MANAGEMENT PLAN and the budget/payments schedule does not exceed the total annual budget allocations up to and including the budget request for that year, and so long as the STATE has sufficient funding available to accommodate such a request.
- 2.1 The LANDOWNER may propose for approval by the STATE, and the STATE may approve, significant changes to the approved MANAGEMENT PLAN or budget to adapt to current conditions. Significant amendments to the approved MANAGEMENT PLAN shall include an amended budget, which will increase the overall STATE's funding share



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above the total amount set forth in the approved budget/payment schedule. The STATE shall make the proposed amendments available for public review prior to final approval.

- 2.3 The proposed amendments may include, without limitation, re-establishment of management priorities, increase or reduction of the specified work, increases to the budget/payments schedule, or time for performance of specified tasks, all as determined considering the natural conditions of the “Forest Stewardship project area,” existing management priorities, threats, potential for decline of the natural resource during any period under consideration, availability of specialized labor or technical expertise, permitting requirements and time needed to obtain permits, and other material factors.
- 2.4 Any proposed expenditures which will increase the overall STATE's funding share above the amount set forth in the approved budget of the approved MANAGEMENT PLAN, which are proposed either as a result of additional costs required to implement the approved MANAGEMENT PLAN or as a result of amendments to the approved MANAGEMENT PLAN, must be mutually agreed upon in advance by and between the STATE and the LANDOWNER. If so agreed upon the approval of these expenditures shall be incorporated in written amendment to this AGREEMENT.
- 2.5 Economic Hardship. Notwithstanding other provisions of this AGREEMENT, in the event that the LANDOWNER determines in good faith that it is financially unable without undue economic hardship to fulfill its funding share as provided in Attachment S2, Section 1.1(b), or to carry out fully the management activities described in the approved MANAGEMENT PLAN, attached as Exhibit A to this AGREEMENT, within the budget and time period established thereby, the LANDOWNER may apply to the STATE to renegotiate the terms thereof.
- (a) Negotiation of Amendment. In such event, the STATE and the LANDOWNER shall meet and negotiate in good faith an acceptable amendment to the approved MANAGEMENT PLAN that seeks to accomplish the significant objectives of the approved MANAGEMENT PLAN reasonably within the LANDOWNER's



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financial means. The amendment may include, without limitation, re-establishment of management priorities and reduction and/or deferral of the specified work, involving significant costs, and/or extension of time for performance of specified tasks, all as determined considering the natural conditions of the “Forest Stewardship project area,” existing management priorities, threats, potential for decline of the natural resource during any period under consideration, other potential sources of funding, and other material factors.

- (b) Disputes. If the STATE and the LANDOWNER are unable to agree reasonably and in good faith on a suitable amendment to the approved MANAGEMENT PLAN, the parties shall refer any such disputes to arbitration as provided in the General Conditions, Section 11.

- (c) No Termination for Economic Hardship. This provision shall not be construed to allow the LANDOWNER or the STATE to terminate this AGREEMENT for economic hardship; it is rather intended to provide a mechanism for reasonable revisions to the approved MANAGEMENT PLAN for economic hardship.

SECTION 3 - PAYBACK OF STATE FUNDS

3.1 In the event that the LANDOWNER sells, conveys, or otherwise transfers LANDOWNER’s right, title, or interest in the “Forest Stewardship project area,” or any portion thereof, during the initial term of this AGREEMENT as defined in Attachment S3, Section 2.1, the LANDOWNER shall within 90 days of the sale, conveyance or transfer of title or interest in the “Forest Stewardship project area,” pay back to the STATE a portion of the amount paid by the STATE to the LANDOWNER pursuant to this AGREEMENT. The amount to be paid back to the STATE shall be that fraction of the total matching funds received by the LANDOWNER under this AGREEMENT that is equal to the fraction of the “Forest Stewardship project area” that is sold, conveyed or otherwise transferred by the LANDOWNER.



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3.2 In the event that the LANDOWNER sells, conveys, or otherwise transfers LANDOWNER’s right, title, or interest in the “Forest Stewardship project area,” or any portion thereof, during the initial term of this AGREEMENT as defined in Attachment S3, Section 2.1, the LANDOWNER will not be required to reimburse the STATE as set forth in Attachment S5, Section 3.1 for the cost-share assistance received if the person(s) who acquire the property contractually agree to assume full responsibility for this AGREEMENT for the initial term of the AGREEMENT, including but not limited to management and financial responsibilities and penalties contained herein. See Agenda Item _____, as amend, approved at the Board of Land and Natural Resources meeting. Nothing in this provision shall relieve the LANDOWNER of its obligations under this AGREEMENT.

SECTION 4 - TERMINATION; DEFAULT; PENALTY PAYBACK

4.1 TERMINATION OF THE AGREEMENT - It is mutually agreed that this AGREEMENT may be terminated for any one of the following reasons on the following terms:

- (a) No State Funding. This AGREEMENT shall be terminated if the STATE does not approve funding for the forthcoming fiscal year of the approved MANAGEMENT PLAN. In such event, this AGREEMENT shall automatically terminate without penalty at the end of the funding period then in effect.
- (b) Partial State Funding. This AGREEMENT may be terminated by the LANDOWNER if the STATE approves only a portion of its share of funding for the forthcoming fiscal year as outlined in the budget provided in the approved MANAGEMENT PLAN.
 - (1) In such event, the LANDOWNER shall elect, by written notice to the STATE, either:
 - (A) to terminate this AGREEMENT without penalty at the end of the funding period then in effect; or



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- (B) to revise the approved MANAGEMENT PLAN and budget in the LANDOWNER's reasonable discretion to accomplish significant management goals which can reasonably be funded with the amount of STATE funding actually approved.
- (c) Transfer to Government Agency. This AGREEMENT may be terminated without penalty if the “Forest Stewardship project area” is transferred or sold to a government agency committed to forest stewardship and that possesses the technical and professional skills to manage the “Forest Stewardship project area” natural resources.
- (d) LANDOWNER Default. This AGREEMENT may be terminated by the STATE upon substantial evidence that progress being made by the LANDOWNER in carrying out the approved MANAGEMENT PLAN is inadequate, incorrect, or insufficient to substantially complete on a timely basis the work called for in the approved MANAGEMENT PLAN subject to the lack of performance notification provisions set forth below.
- (1) Penalties Apply. In the event of termination for default in accordance with these provisions, the penalty payback provisions set forth below shall apply.
- (2) Lack of Performance Notification. In such event, the STATE may terminate for default, provided the STATE adheres to the following procedures for notice and opportunity to cure prior to termination:
- (A) The STATE shall first notify the LANDOWNER in writing of any perceived inadequacy, incorrectness or insufficient progress. The STATE and the LANDOWNER shall meet within two weeks



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thereafter, and every three months thereafter until one year following the date of the notice, and discuss in good faith the perceived failure and the reasons therefore and any subsequent progress or lack thereof. If the reason for the failure is a good faith inability of the LANDOWNER to carry out the terms of the MANAGEMENT PLAN for reasons beyond the LANDOWNER's reasonable control, including without limitation economic hardship as described in Attachment S5, Section 2.5 above, the STATE and the LANDOWNER shall specifically consider the need to amend the approved MANAGEMENT PLAN, including extending the time to carry out the work called for in the approved MANAGEMENT PLAN and/or revising the budget established in the approved MANAGEMENT PLAN, subject to the provisions of Attachment S1, Section 1.5 and Attachment S5, Section 2 of this AGREEMENT regarding amendments to this AGREEMENT and the approved MANAGEMENT PLAN. Following the date of the notice, the STATE shall be obligated to inspect the “Forest Stewardship project area” once each quarter after notifying the LANDOWNER, to determine the updated status of the perceived default.

- (B) Following the expiration of the one year period following notice of default given by the STATE to the LANDOWNER and failure of the LANDOWNER to remedy the default, or to make significant progress to remedy the default if by its nature the default cannot reasonably be remedied within one year, the STATE may elect to notify the LANDOWNER of its intention to terminate this AGREEMENT for default. Such notice shall be in writing, shall state that the STATE will terminate the AGREEMENT for default on a date not less than 3 months thereafter if the LANDOWNER



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does not remedy the default, or to make significant progress to remedy the default if by its nature the default cannot reasonably be remedied within 3 months, and shall specify that penalties as provided under this AGREEMENT shall apply.

- (C) If the LANDOWNER fails to remedy the default within 3 months thereafter, or to make significant progress to remedy the default if by its nature the default cannot reasonably be remedied within 3 months, the STATE may terminate this AGREEMENT effective immediately for default by written notice thereof to the LANDOWNER.
 - (D) The STATE shall be deemed to have complied with these provisions if it attempts in good faith to meet with the LANDOWNER and to inspect the “Forest Stewardship project area” as provided above, whether or not the LANDOWNER cooperates in such procedures.
- (3) All disputes regarding default and termination under this AGREEMENT, which cannot be resolved by the parties, shall be referred to arbitration as provided in the General Conditions, Section 11.
 - (4) If the LANDOWNER has not fully performed its work under this AGREEMENT on expiration or termination of this AGREEMENT, the STATE may withhold the final payment to the LANDOWNER pending full completion of the LANDOWNER's work. This withheld payment shall be paid by the STATE to the LANDOWNER on final acceptance and tax clearance as provided in Attachment S2, Section 1.2 (b) and the General Conditions, Section 17.



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4.2 PENALTY PAYBACK -

(a) Payback and Penalties. In the event that the LANDOWNER defaults on this AGREEMENT as provided in Attachment S5, Section 4.1(d) above and the STATE has followed the Lack of Performance Notification procedures as outlined in Attachment S5, Section 4.1(d)(2) above, the LANDOWNER shall promptly pay to the STATE the following payback and penalty monies:

(1) Refund of State Funds - 3 Years. All funds paid from the initial date of this AGREEMENT by the STATE to the LANDOWNER in the previous 3 years (or such portion thereof as STATE shall have funded if this AGREEMENT shall have been in effect for less than 3 years) shall be returned to the STATE. In the event that this AGREEMENT shall have been in effect for more than 3 years, the LANDOWNER shall be liable to pay back State funds for the immediately preceding 3 years. In addition, the LANDOWNER shall pay to the STATE a penalty of two percent of the total of funds that are returned to the STATE.

(b) No Other Party Liable. Only the LANDOWNER receiving State funding under the FOREST STEWARDSHIP PROGRAM shall be liable to the STATE under this AGREEMENT for the payback and penalty.

(c) Disputes. The LANDOWNER shall have the right to submit any disputes to the arbitration procedure as outlined in the General Conditions, Section 11 if it feels that the imposition of payback, and/or additional penalties is unwarranted.

4.3 VIOLATIONS OF AGREEMENT - It is expressly understood and agreed that violations which are not caused by the LANDOWNER shall not constitute or give rise to a default by the LANDOWNER under this AGREEMENT and no penalty provisions shall apply to the LANDOWNER.



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4.4 EFFECT OF EMINENT DOMAIN -

- (a) Full Condemnation. If any action in eminent domain for the condemnation of the fee title of the entire “Forest Stewardship project area” described herein is filed, or if the “Forest Stewardship project area” is acquired in lieu of eminent domain for a public improvement by a public agency or person or whenever there is any such action or acquisition by the federal government or the state government or any person, instrumentality or agency acting under authority or power of the federal government or the state government, this AGREEMENT shall be deemed null and void without penalty as to the land actually being condemned or so acquired as of the date the action is filed, and upon the termination of such a proceeding, this AGREEMENT shall be null and void without penalty for all land actually taken or acquired.
- (b) Partial Condemnation. When such an action to condemn or acquire less than all the entire “Forest Stewardship project area” is filed, this AGREEMENT shall be deemed null and void without penalty as to the portion so condemned or acquired.
- (c) Adjustment of approved MANAGEMENT PLAN. The land actually taken by the means set forth above in this Section shall be removed from this AGREEMENT and the approved MANAGEMENT PLAN and budget adjusted accordingly on a reasonable basis by the STATE and the LANDOWNER.

SECTION 5 - INCORPORATION OF CHAPTER 195F, HAWAII REVISED STATUTES

- 5.1 Incorporation. The provisions of chapter 195F, Hawaii Revised Statutes, as amended, are incorporated by reference into this AGREEMENT. In the event that there is any conflict between the provisions of this AGREEMENT and the provisions of chapter 195F, Hawaii Revised Statutes, the latter shall be controlling.



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5.2 Renumbering. In the event that chapter 195F, or any of the sections under chapter 195F, Hawaii Revised Statutes, are renumbered, any references to the chapter or sections in this AGREEMENT shall be deemed renumbered accordingly.

EXHIBIT A

_____ Forest Stewardship Management Plan.



Forest Stewardship Management Plan

Keolu, Kailua Ahupua'a, Ko'olaupoko District



PO Box 250
Pa'auilo, HI 96776

Responsible Forester:

Willie Rice
willie_rice@forestsolutionsinc.com
Tel +1 808 776 9900
Fax +1 808 776 9901

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1. CLIENT AND PROPERTY INFORMATION

Client

Landowner Name: MDHE LLC. / Dawn Horn, managing member

Address: 1711 Kanapuu Drive
Kailua, HI 96734

Email: kailuadawn@gmail.com

Phone | Fax: +1 (808) 225-7873

TMK number: (1) 4-2-004:001

State Zoning: Urban 6.7 acres, Conservation (General subzone) 30.2 acres

County Zoning: Restricted Preservation District (P-1) 30.2 acres, General Preservation District (P-2) 6.7 acres

Total property acreage: 36.9 acres

Proposed stewardship area: 6 acres

Elevational range: 80 ft – 390 ft

Slope: 5% - 70%

Perennial/Intermittent Streams: None

Consultant

Company: Forest Solutions, Inc.

Name: Willie Rice

Title: Senior Forester

Address: 42-378 Kalapahapu'u Road
P.O. Box 250
Pa'auilo, HI 96776

Email: willie_rice@forestsolutionsinc.com

Phone | Fax: +1 (808) 776-9900 x238 | +1 (808) 776-9901


Plan Completion Date:

2. FSP SIGNATURE PAGE

Professional Resource Consultant Certification:

I have prepared (or revised) this Forest Stewardship Plan. Resource professionals have been consulted and/or provided input as appropriate during the preparation of this plan.

Prepared by: Forest Solutions, Inc.

Professional Resource Consultant's Signature/Date: 

Professional Resource Consultant's Name: Willie Rice

Applicant Certification:

I have reviewed this Forest Stewardship Plan and hereby certify that I concur with the recommendations contained within. I agree that resource management activities implemented on the lands described shall be done so in a manner consistent with the practices recommended herein.

Prepared for: MDHE LLC.

Applicant Dawn Horn, Managing Member

Applicant's Signature/Date:  3/21/2017

Applicant's Name: Dawn Horn

State Forester's Approval:

This plan meets the criteria established for Forest Stewardship Plans by Hawaii's Forest Stewardship Advisory Committee. The practices recommended in the plan are eligible for funding according to state of Hawai'i Forest Stewardship Program guidelines and administrative rules.

Approved by: Division of Forestry and Wildlife Administrator

State Forester's Signature/ Date: 

State Forester's Name: David G. Smith

3/30/17
Date

Approved by: Forest Stewardship Advisory Committee_

Committee Signature/Date: January 20, 2017

3. Executive Summary

The goal for this Forest Stewardship Management Plan is to transform a low-benefit, non-native dominated landscape to a native and Hawaiian canoe plant lowland mesic forest and shrubland with improved habitat, increased biodiversity and a healthier functioning ecosystem on TMK (1)-4-2-004:001 in Kailua, O'ahu. The property is 36.9 acres, of which only 6 acres is currently proposed for indigenous and endemic plant restoration. The scope of this Forest Stewardship Management Plan spans ten (10) years from date of initial implementation, and would strive to establish 0.6 acres of forest per year via undesirable plant removal and native and Hawaiian canoe plant replacement, using primarily manual methods. This management plan has the following management objectives:

- i. Transform the non-native species dominated landscape and convert it to a native and Hawaiian canoe plant lowland mesic forest and shrubland.
- ii. Improve the functioning of the watershed by increasing biodiversity, managing forest health, preventing fires, improving rainwater infiltration, and reducing soil erosion and sedimentation.
- iii. Enhance native wildlife habitat by re-establishing more endemic and indigenous plant species in a diverse native plant and agroforestry community.

The current natural resource concerns on the property include invasion of noxious and invasive species, soil erosion and sedimentation, low biodiversity and a lack of native species.

In the long term the vision of the applicant is to restore and maintain a healthy forest habitat on their property. A thriving native plant community will provide a focal point on the landscape for native fauna and flora, and support a healthy lifestyle for all its inhabitants.

4. Introduction

4.1. Project background and objectives

The goal for this Forest Stewardship Management Plan is to transform a low-benefit, non-native dominated landscape into a native plant dominated lowland forest and shrub land with native, Hawaiian canoe, and agroforestry plants to improve habitat, increase biodiversity and a healthier ecosystem functioning. To achieve the objectives of removing non-native species dominated landscapes and convert to native species dominated forest, the targeted management practices will suppress non-native species in the main planting areas, restore native plant species, control the feral pig population, manage the community interface areas, and mitigate the wildfire threat. To achieve the objective of improving the functioning of the watershed, the management approaches will be to reduce erosion and sedimentation and improve storm water runoff quality for the benefit of the downslope wetland ecosystem. The vision for this property is for current and future generations to live a low impact, energy efficient, sustainable lifestyle and over time restore forest health, and expand native plant, pollinator and wildlife habitat throughout the entire property.

4.2. Site description

4.2.1.1. Parcel and location

The MDHE LLC property, TMK (1)-4-2-004:001, spans elevations between 80 and 390 feet above sea level, on the east side of the Ko'olau mountain range, Kailua ahupua'a, Ko'olaupoko district, O'ahu (Figure 1). The western edge is bordered by 81 individual lot owners within the communities of Kailua Bluffs and Keolu Summit. The eastern border follows along a ridgeline between 280 and 360 feet, which is the boundary to Bellows Marine Corps Training Area and the dividing line between the ahupua'a of Kailua and Waimānalo.

The topographical relief is high on the property, with slopes from 5-70% and aspects in all cardinal directions.

Access to the property is via Kanapu'u Drive in the Kailua Bluffs community. Kanapu'u Drive can be accessed off either of the main thoroughfares of Kalaniana'ole Highway or Keolu Drive. There are a few unimproved and steeply sloped roads within the property which are accessible only to off-road vehicles. The best access is currently via foot along cleared pathways because only slow progress can be made through the dense brush.

The area proposed for restoration is approximately 6 acres and located near the property access point off Kanapu'u Drive. The site encompasses a portion of a small valley on the property including the drainage path at the valley floor, which only experiences overland flows during heavy rainfall. The majority of the 6 acre site is on a hillside with an aspect of northwest and a slope of approximately 45%.

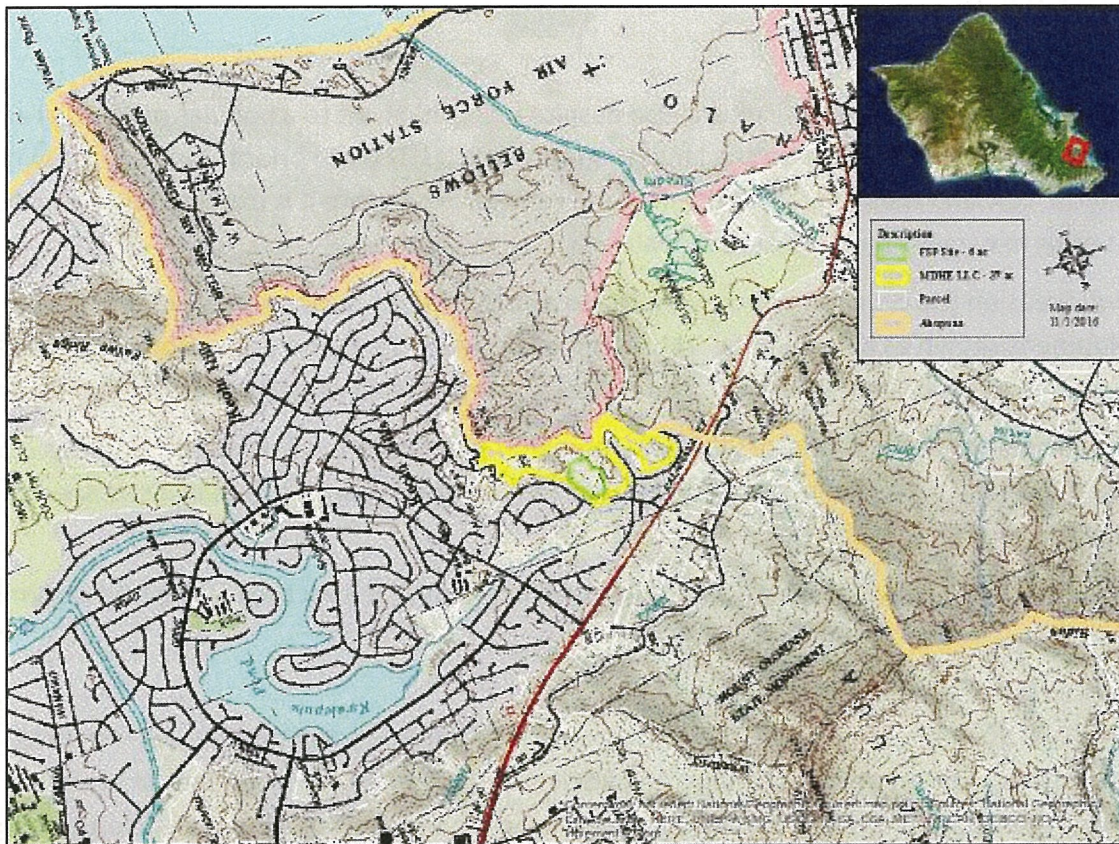


Figure 1. Topographical and perspective maps of the property and restoration site featured in the Forest Stewardship Management Plan. Access is via Kanapu'u drive and the red area indicates the property boundary and green is the project area (6 acres).

4.2.2. Site History

4.2.2.1. Land use history

This property has a long history of agricultural use despite being adjacent to a popular residential area. The parcel was a part of a ranch which used the land for grazing cattle. The use prior to this is unknown, but the land is within the Lowland Mesic Forest and Shrubland zone and therefore it is expected that a native forest was present prior to conversion to pasture for cattle.

There are two areas on the property which were zoned as Urban areas because they were part of the adjacent urban development known as Kailua Bluffs. This occurred between 1980 and 2003. However, the Urban zoned land was never subdivided from the larger parcel and thus always remained undeveloped and natural.

During a reconnaissance of the property we found remnant fencing providing proof the land was used for cattle. The severely degraded quality of the vegetation and dominating presence of invasive species is also typical of land once used for pasture.

No management activities of any kind have occurred on the property for decades, except for intermittent feral pig control.

4.2.2.2. Historical or cultural resources

As part of the Final Environmental Assessment (EA) completed by Group 70 International, Inc. in March, 2015 an archeological inventory survey was conducted by Scientific Consultant Services, Inc. which determined that “no cultural activities were identified to occur at the specific project site” and “no historic properties were identified during the archaeological survey of the site”.

In the unlikely event that objects of historical, cultural, or archaeological importance are discovered during any forest management activities, work near the find will halt and these items will be reported to the State Historic Preservation Division of the Department of Land and Natural Resources (SHPD, dlnr@hawaii.gov, (808) 692-3015).

4.2.2.3. Aesthetic values and infrastructure

Exceptional views exist throughout the property (Figure 2) and because of its prominence the ridge itself adds aesthetic value to the landscape. Preserving and enhancing these aesthetic values will be achieved through best management practices for all proposed forestry activities. Restoring a native landscape will also enhance the aesthetic value, as well as improve healthy functioning of the forest ecosystem.

A home site is a part of the planned development on the property and will be adjacent to the forest restoration area (Figure 3). Other near term infrastructure improvements include a driveway for property access with the installation of culverts to maintain the natural drainage.

There are several instances of illegal encroachment where neighbors have altered the landscape and vegetation. As directed by the DLNR, OCCL encroaching neighbors were required to remove hard surface and structural encroachments such as hot tubs, golf tees, chicken coops, lanais, storage sheds, fences, and non-retaining walls. An encroaching CRM wall and concrete swale between the subject property and the Keolu Summit subdivision was resolved by issuance of an After-The-Fact Conservation District Use Permit (CDUP) No.

OA 3721 dated September 8, 2014. Landscaping and brush clearing encroachments were resolved by requiring the neighbors to cease activity and allow the affected areas to grow over naturally.



Figure 2 a & b. Aesthetic features on the property include exceptional views both mauka and makai. These features would be preserved within the context of the proposed management activities.





Figure 3. Map showing the layout of the property and proposed developments.



Figure 4. Photo showing current foot path for site access, future proposed driveway site, encroaching plantings, and lower edge of FSP restoration site.

4.3. Plant ecosystems and forest health

4.3.1.1. Current vegetation description

Across the property, the species composition is almost entirely non-native, invasive alien species. The Final EA of March, 2015 states, “the floristic composition was identified as that typical for lowland Oahu: native species accounted for only 3% of the plants encountered.” This number is measured from species richness or the biodiversity of the ecosystem. “The parcel is dominated by introduced plant species, including naturalized species and various ornamentals planted by neighboring landowners (encroachment)” (Final EA, March 2015). Dominant plant species include Guinea grass, koa haole, and Formosa koa.

The 6-acre restoration site is similar to the rest of the property. However, it includes some of the best planting habitat within the property as evidenced by the current vegetation cover and well established encroachment plantings of ornamentals. The large Formosa koa found on this northerly aspect is between 2 and 12 inches in diameter and reaches a height of approximately 40-feet (Figure 5). The understory has a less dense Guinea grass cover and an increased non-native species richness of shrubs and herbaceous plants. In comparison, the majority of the property is a monotypic stand of haole koa and Guinea grass (Figure). It is apparent that the habitat and climate at this microsite is different from the rest of the property and will help future restoration work be more successful than planting at the top of the windy and sunny ridge.



Figure 5. Photo taken within the 6-acre restoration site showing the growth of existing vegetation.

Along boundaries with neighboring land owners, there are various plants such as fruit trees, ti and ornamentals that are encroaching on to the site and surviving as naturalized species. These plantings are only surviving because of supplementary watering, which is a technique that would also be a part of the restoration plan.

Table 1. Plant species present on the property, list adapted from the Final Environmental Assessment, 2015.

Species name	Species	Status	Abundance	HWRA [‡]	Encroaching
Trees					
papaya	<i>Carica papaya</i>	Naturalized	Rare	2	X
ironwood	<i>Casuarina equisetifolia</i>	Naturalized	Rare	21	
satinleaf	<i>Chrysophyllum oliviforme</i>	Naturalized	Occasional	7	
fiddlewood	<i>Citharexylum spinosum</i>	Naturalized	Rare	7	
autograph tree	<i>Clusia rosea</i>	Naturalized	Rare	9	
common fig	<i>Ficus carica</i>	Ornamental	Rare	#N/A	X
fern tree	<i>Filicium decipiens</i>	Naturalized	Rare	2	X
macadamia nut	<i>Macadamia integrifolia</i>	Ornamental	Rare	-1	X
horseradish tree	<i>Moringa oleifera</i>	Ornamental	Rare	1	X
opiuma	<i>Pithecellobium dulce</i>	Naturalized	Rare	14	
plumeria	<i>Plumeria rubra</i>	Ornamental	Rare	-5	X
monkeypod	<i>Samanea saman</i>	Naturalized	Rare	4	X
white sandalwood	<i>Santalum album</i>	Naturalized	Rare	-3	
bumelia	<i>Sideroxylon persimile</i>	Naturalized	Common	8	
African tulip tree	<i>Spathodea campanulata</i>	Naturalized	Rare	14	
Cuban mahogany	<i>Swietenia mahagoni</i>	Naturalized	Rare	2	
Java plum	<i>Syzygium cumini</i>	Naturalized	Occasional	9	
tropical almond	<i>Terminalia catappa</i>	Naturalized	Rare	4	X
Manila palm	<i>Veitchia merrillii</i>	Ornamental	Rare	-2	X
niu, coconut	<i>Cocos nucifera</i>	Introduced	Rare	---	
kou	<i>Cordia subcordata</i>	Introduced	Rare	---	X
maia, banana	<i>Musa</i> sp. Hybrid	Introduced	Rare, clumped	---	
Bushes/Shrubs					
Formosa koa	<i>Acacia confusa</i>	Naturalized	Common	10	
klu	<i>Vachellia farnesiana</i>	Naturalized	Uncommon	#N/A	
Fukien tea	<i>Carmona retusa</i>	Naturalized	Abundant	4	
croton	<i>Codiaeum variegatum</i>	Ornamental	Rare	-4	X
lantana	<i>Lantana camara</i>	Naturalized	Occasional	32	
koa haole	<i>Leucaena leucocephala</i>	Naturalized	Very Abundant	15	
mock orange	<i>Murraya paniculata</i>	Naturalized	Occasional	6	
common guava	<i>Psidium guajava</i>	Naturalized	Uncommon	21	
coral berry	<i>Rivina humilis</i>	Naturalized	Common	11	
Christmas berry	<i>Schinus terebinthifolius</i>	Naturalized	Occasional	19	
kolomona haole	<i>Senna surattensis</i>	Naturalized	Uncommon	0	
a'ali'i	<i>Dodonea viscosa</i>	Indigenous	Rare		
ulei	<i>Osteomeles anthyllidifolia</i>	Indigenous	Uncommon		

‡ <https://sites.google.com/site/weedriskassessment/>

Table 2. Plant species list adapted from the Final Environmental Assessment, 2015, continued.

Species name	Species	Status	Abundance	HWRA [‡]	Encroaching
Grasses					
giant reed	<i>Arundo donax</i>	Naturalized	Rare	12	X
hedge bamboo	<i>Bambusa multiplex</i>	Ornamental	Rare	5	
California grass	<i>Urochloa mutica</i>	Naturalized	Uncommon	#N/A	
swollen fingergrass	<i>Chloris barbata</i>	Naturalized	Uncommon	20	X
sourgrass	<i>Digitaria insularis</i>	Naturalized	Common	20	
red sprangletop	<i>Leptochloa panicea</i>	Naturalized	Rare	12	X
barnyard grass, Japanese millet	<i>Echinochloa crus-galli</i>	Naturalized	Rare	8	X
mexican weeping bamboo	<i>Otatea acuminata</i>	Ornamental	Rare	4	X
Guinea grass	<i>Urochloa maxima</i>	Naturalized	Very Abundant	#N/A	
NO NATIVE GRASSES					
Ferns					
palm fern, hammock fern	<i>Blechnum appendiculatum</i>	Naturalized	Uncommon	17	
Japanese climbing fern	<i>Lygodium japonicum</i>	Naturalized	Rare	23	
NO NATIVE FERNS					
Herbaceous plants and Vines					
Chinese violet	<i>Asystasia gangetica</i>	Naturalized	Abundant	12	
hairy abutilon	<i>Abutilon grandifolium</i>	Naturalized	Uncommon	6	
sisal, malina	<i>Agave sisalana</i>	Naturalized	Rare	10	X
	<i>Agave sp.</i>	Ornamental	Rare	#N/A	X
aloe	<i>Aloe vera</i>	Naturalized	Rare	#N/A	X
asparagus "fern"	<i>Asparagus densiflorus</i>	Naturalized	Uncommon	15	
climbin asparagus "fern"	<i>Asparagus plumosus</i>	Naturalized	Uncommon	#N/A	
pink ruellia	<i>Barleria repens</i>	Ornamental	Uncommon	#N/A	
beggartick	<i>Bidens alba</i>	Naturalized	Rare	12	
	<i>Bidens cyanapifolia</i>	Naturalized	Uncommon	#N/A	
maunaloa vine	<i>Canavalia cathartica</i>	Naturalized	Uncommon	#N/A	
	<i>Cereus sp.</i>	Ornamental	Rare	#N/A	X
partridge pea	<i>Chamaecrista nictitans</i>	Naturalized	Uncommon	0	
scarlet-fruited gourd	<i>Coccinia grandis</i>	Naturalized	Rare	21	
Spanish clover	<i>Desmodium incanum</i>	Naturalized	Uncommon	#N/A	
money tree cultivar	<i>Dracaena marginata</i>	Ornamental	Rare	-1	X
sanderiana	<i>Dracaena sanderiana</i>	Ornamental	Rare	#N/A	X
garden spurge	<i>Euphorbia hirta</i>	Naturalized	Uncommon	#N/A	X
milk-stripped euphorbia	<i>Euphorbia lactea</i>	Ornamental	Rare	8	X
comb hyptis	<i>Hyptis pectinata</i>	Naturalized	Occasional	#N/A	
Brazilian jasmine	<i>Jasminum fluminense</i>	Naturalized	Common	16	

‡ <https://sites.google.com/site/weedriskassessment/>

Table 3. Plant species list adapted from the Final Environmental Assessment, 2015, continued.

Species name	Species	Status	Abundance	HWRA ¹	Encroaching
Herbaceous plants and Vines					
sensitive plant	<i>Mimosa pudica</i>	Naturalized	Rare	#N/A	
wild bitter melon	<i>Momordica charantia</i>	Naturalized	Rare	13	
glycine vine	<i>Neonotonia wightii</i>	Naturalized	Uncommon	7	
Mickey Mouse plant	<i>Ochna thomasiana</i>	Naturalized	Uncommon	8	
cochineal cactus	<i>Opuntia cochenillifera</i>	Naturalized	Rare	#N/A	X
panini	<i>Opuntia ficus-indica</i>	Naturalized	Rare	#N/A	
passion fruit vine	<i>Passiflora edulis</i>	Naturalized	Rare	6	
huehue haole	<i>Passiflora suberosa</i>	Naturalized	Occasional	12	
niuri	<i>Phyllanthus debilis</i>	Naturalized	Uncommon	#N/A	X
common plantain	<i>Plantago major</i>	Naturalized	Rare	#N/A	
pigweed	<i>Portulaca oleracea</i>	Naturalized	Rare	#N/A	
wedelia	<i>Sphagneticola trilobata</i>	Naturalized	Rare	13	
giant toad plant	<i>Stapelia gigantea</i>	Naturalized	Uncommon	3	
ti, ki	<i>Cordyline fruticosa</i>	Introduced	Rare	---	X
yellow wood sorrel, ihi ai	<i>Oxalis corniculata</i>	Introduced	Uncommon	---	
uhaloa	<i>Waltheria indica</i>	Indigenous	Occasional	---	

<https://sites.google.com/site/weedriskassessment/>

Table 4. Avian species list adapted from Final EA March, 2015.

Species name	Species	Status
Avian Species		
Spotted Dove	<i>Streptopelia chinensis</i>	Alien
Zebra Dove	<i>Geopelia striata</i>	Alien
Red-vented Bulbul	<i>Pycnonotus cafer</i>	Alien
Japanese White-eye	<i>Zosterops japonicus</i>	Alien
Chinese Hwamei	<i>Garrulax canorus</i>	Alien
Red-billed Leiothrix	<i>Leiothrix lutea</i>	Alien
White-rumped Shama	<i>Copsychus malabaricus</i>	Alien
Common Myna	<i>Acridotheres tristis</i>	Alien
Saffron Finch	<i>Sicalis flaveola</i>	Alien
Northern Cardinal	<i>Cardinalis cardinalis</i>	Alien
House Finch	<i>Haemorhous mexicanus</i>	Alien
House Sparrow	<i>Passer domesticus</i>	Alien
Common Waxbill	<i>Estrilda astrild</i>	Alien
Java Sparrow	<i>Padda oryzivora</i>	Alien

4.3.2. Historic vegetation description (Lowland Mesic Forest and Shrubland)

The original defined, but now extinct forest type in this area is lowland mesic forest and shrubland. The existing vegetation is reminiscent of this forest structure with some low stature forested areas amongst shrub and grass lands. This native ecosystem would have been heavily disturbed by the Hawaiians as this was their living zone or wao kanaka. Within this area they would have collected many daily items from the forest. In more recent history these mesic areas have been dominated by Guinea grass and haole koa pasture, see Figure . The lands are well suited for this purpose, and it is not surprising the resultant dominance by pasture weeds currently.



Figure 6. Monotypic stand of haole koa and Guinea grass populates the majority of the property and provides very little good or diverse habitat.

A typical lowland mesic forest consists of a diverse, low in stature, tree canopy dominated by ‘ōhi‘a, koai‘a, lama, olopuā or halapepe amongst many other characteristic species. The understory is variable and species tend to aggregate, depending upon the habitat, whether they be shrubs, ferns or herbaceous plants. ‘A‘ali‘i would be the most common shrub species, accompanied by ferns such as *Asplenium* spp., *Dicranopteris* spp. and *Pteris* spp¹.

Because of the use of this forest zone by the Hawaiians, many Polynesian introduced species would also have been present such as niu (coconut), hala, kou, kukui, milo and hau. Other species that would have been used for food and construction would also have been found here and cultivated to provide the essentials of everyday life.

¹NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 February 2009.

4.3.3. Pathogens, insects and invasive animals

During a brief site visit, no pervasive pathogens or insect problems were observed or discussed with the property owner. Given the location of the property we expect that typical pathogens and insects would be present that could affect plantings such as twig borers, thrips and gall wasps. Constant watchfulness for these threats should always be sustained as they can rapidly change.

The most problematic mammal known on the property is the feral pig (*Sus scrofa*). Feral pigs have been managed to keep their population low through regular trapping and hunting, however because the property is not currently fenced they are transient. Other mammals that are most likely present, but not observed during the site visit include monogoose (*Herpestes javanicus*), cat (*Felis catus*), feral peacock (*Pavo cristatus*) and rodents.

During the March, 2015 Final EA avian and mammal survey, all species detected were alien to Hawaii. The findings of the survey are consistent with the location and with the highly-disturbed nature of habitat present on the property (Final EA, March 2015). The long-term objective is to enhance or re-introduce native wildlife to the area, such as native invertebrates and pollinators. In order to accomplish this objective first steps are to re-establishing native plant species in a diverse native plant community.

4.3.4. Wildfire

Wildfire is and will continue to be the highest threat on this property due to its location within a dry zone, among wildlands and homes, and with the existing vegetative cover. The wildfire mitigation component is an essential part of this plan to be maintained.

The Oahu fire department will handle all fire response as typical, there is no further fire response plans or actions proposed under this plan for the property.

4.3.5. Hydrology

4.3.5.1. Streams and wetlands

The property does not contain any streams or wetlands. It does however have several drainage areas which are unmarked, but within topographical gulches. There are two primary gulches that see overland flow following heavy rain events.

There are also several drainage ditches along the boundary of the property and project site which were constructed by the adjacent subdivision developer. These drainage ditches were designed to collect runoff and carry it to the runoff detention basin below, which was also constructed as part of the development.

4.3.5.2. Rainfall patterns

Mean annual rainfall in this location is 40 inches per year and ranges from 1.5 inches per month in the comparatively dry summer months to 6 inches per month (Figure) in the relatively wetter months of November through March².

² 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

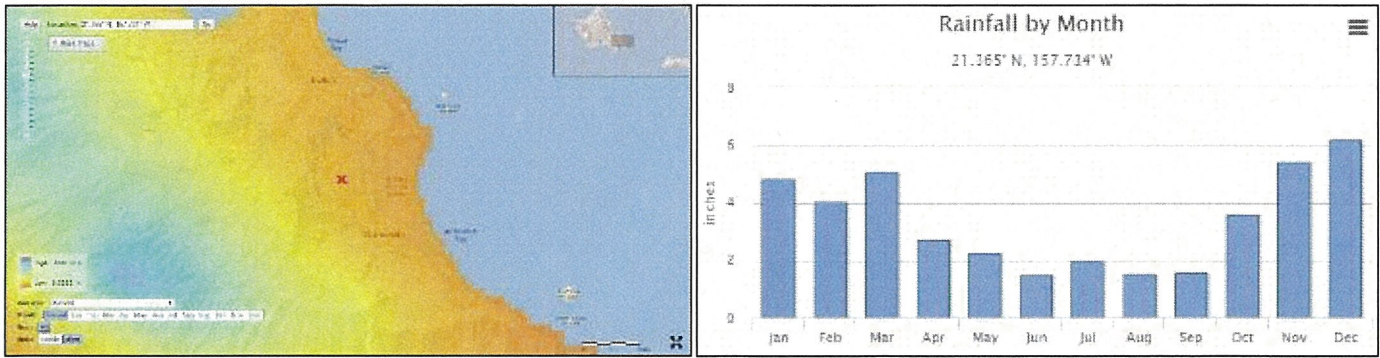


Figure 7. The property is located at the “X” and is within a mesic area.

4.3.6. Soils

4.3.6.1. Soil classification

The soil type across the site is Papa’a clay (map unit PYF) of basalt parent material. These are moderately deep soils, with depth to the first restrictive layer between 40 and 60 inches, well drained with high runoff³. There is also a small strip of Alaaloa silty clay on the northern edge of the restoration site adjacent to the lot owners. It is an older substrate soil.

4.3.7. Threatened and endangered species

Endangered species were not observed on the property during the site visit. An assessment for threatened and endangered species was completed as part of the March, 2015 Final EA natural resource survey and no flora or fauna was found on the entire property that was either threatened, endangered, candidate or rare. Other non-native birds observed on the property can be found in the Final EA⁴.

4.4. Additional threat assessments

In addition to the threat of wildfire and the ongoing problem of invasive species dominance, there are several other threats to this property and the proposed restoration project including vandalism and sedimentation. Vandalism in particular is very real because of the property’s long boundaries with both a heavily populated community and wildlands where people can trespass without knowledge. The existing encroachments of the current neighbors show that it is likely that illegal trespassing will continue to occur and that this may result in vandalism to the restoration project area.

Although sedimentation does occur on the property it is currently insignificant. However, if clearing were to increase, the exposed soil would be vulnerable to erosion. This can easily be mitigated through the use of best management practices.

³<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

⁴ MDHE LLC. Final Environmental Assessment, 2015



Figure 8. FSP site map. Hatching shows a rough layout of the patchwork establishment protocol.

5. Management Prescriptions

A following set of forest management prescriptions for the 6-acre restoration site are recommended as implementing actions necessary to achieve the management objectives. These implementing actions include the removal of undesirable non-native brush, the re-establishment of conservation cover protected by maintained fuel breaks, and other forest stewardship management practices including:

- 1) Fencing
- 2) Tree/shrub site preparation
- 3) Irrigation
- 4) Tree/shrub establishment
- 5) Groundcover establishment
- 6) Mulching
- 7) Weed Control
- 8) Forest health and protection
- 9) Monitoring

The management prescriptions listed above are in sequential order of operation.

The project is planned to be implemented over 10 years with approximately 0.6 acres established every year, so that most management practices will occur in a cyclical manner annually.

5.1. Fencing (NRCS code 382)

Fencing is the first step toward re-establishing a native forest that is in an area threatened by pigs and trespassing. A 4-foot hogwire fence will be installed along the perimeter boundary of the 6-acre restoration area. Difficulties encountered will include topographic relief and brush. In order to make a strong fence that will endure, proper alignment, marking, and clearing will occur prior to installation. An approximate 8-foot path should be cut along the alignment where the fence is to be installed. All brush should be removed within this path so that the fence can be safely and properly unrolled.

The fence will follow the following recommendations:

1. 4-ft (47-inch) hogwire (woven wire), 12-14 gauge, galvanized steel, with smaller openings along the ground
 - a. Strung approximately 2-inches above ground
2. 6-foot galvanized T-post
 - a. Spaced between 12-15 ft and at all low and/or high points
3. Either 8-ft x 4-5-inch diameter pressure treated wood or 6-ft x 2-inch diameter galvanized steel pipe posts (with water tight end caps), braced in corners and at gates.
 - a. Spacing approximately 200-ft
4. Single strand 12-gauge barbwire
 - a. Strung between ground and hogwire
5. All galvanized clips, gates, and other hardware

6. An additional single or double strand of smooth 12-gauge wire can be strung at the top if the budget allows (barbed wire will not be used here).

It is important to get the fence line as straight as possible so that it can be pulled to an appropriate tension. This will prevent sagging and premature fence failure from falling trees and branches.

In order to deter illegal trespassing by vandals and neighbors encroaching on to the property for their own benefit "No Trespassing" signs will be put up along the perimeter fence.

5.2. Site preparation (NRCS code 315, 384, 490)

Planting areas will need to be prepared using a combination of invasive tree removal, herbaceous vegetation control, and digging. The first step of site preparation will include the removal of all undesired invasive and noxious plants. No herbicide will be used to control undesirable species because of the landowners' adverse reactions to herbicides and such; primarily mechanical methods will be used. The application of potassium nitrate will be evaluated as an alternative method of weed control. Motor-manual site preparation includes saws, weed whackers, brush cutters, loppers, weed wrench and hand pulling. Some larger Formosa koa will be left to provide protection for new plantings, however they will be removed as native vegetation becomes established. These trees will be carefully limbed and then felled to limit injury to recent plantings. Bagging seed heads of this species will also be evaluated and if deemed safe and practicable will be also be implemented. The second step in site preparation will involve digging individual holes for seedlings. A pick axe or gas auger can be used to dig holes approximately 1.5' deep and 1' in diameter. Holes should be dug immediately before planting, potentially on the same day, to minimize soil compaction or rain-induced runoff.

In order to effectively prepare the planting site prior to planting, timing is important. It is not feasible to clear the entire 6-acre area and plant it soon afterwards. Instead a patchwork management protocol will be used to establish small, non-adjacent areas (Figure 8). No new area will be prepared until the previous area has been planted and established. This patchwork protocol will help to prevent sedimentation and improve the aesthetics of the restoration project to neighboring land owners. The schedule of operations prescribes restoration of 0.3 acre semi-annually or once every 6 months, which is an area approximately 100' x 100'. This will allow for full restoration of the 6-acre site within 10 years.

5.3. Irrigation (NRCS code 441)

Micro-irrigation or drip irrigation is recommended to be used to help with seedling survival and establishment. An irrigation specialist should be consulted to determine the best system for the project's needs. A specialist will incorporate such things as water pressure, nozzle quantity, nozzle outputs and pipe size so that all plants receive consistent and ample volumes of water.

Due to the patchwork establishment protocol, all irrigation components should be reusable and moved as necessary from cell to cell. Plants will be irrigated via the landowners' county water connection and receive water until they become established. Once plants are established than irrigation lines will become available for a new establishment area.

5.4. Groundcover, shrub and tree establishment (NRCS code 612, 327)

Hand planting will be accomplished using a pick-axe, tree spade or dibble as appropriate for the nursery stock. The soil surface should be perforated to a depth slightly greater than the length of the seedling root stock, and the seedling should be placed into this hole. The root collar should be marginally lower than the level of the soil, between 1/8" and 1/4", with the root mass oriented vertically; the tip of the root mass should not bend outwards (so-called "J-rooting"). Soil is then covered around the root system and slightly compacted so that the possibility of air pockets is removed. Air pockets will prevent the roots from growing.

Spacing and distribution of tree species should conform to approximately 20' x 20' grid system. Plants growing in larger pots will be planted first, because of their soil and root resource of the pot they will become established more readily. This is approximately 109 trees per acre. At this density, canopy cover will be achieved in appropriate time frame. Canopy species, such as, ulu, kukui, kamani, and hala all have a large canopy to provide substantial amount of shade cover. The distribution of tree, shrub and groundcover species should be planted irregular to mimic a natural setting. An ideal distribution is 25% tree species, 35% shrub species and 40% groundcover species.

5.5. Nutrition (NRCS code 590)

A fertilizer treatment assists with early seedling growth and development, and is recommended to help establish native seedlings. At planting, a 4-oz. dose of fertilizer is distributed evenly within a 12" diameter area centered on the seedling stem. An organic low dose fertilizer can be used such as chicken manure (3-2-2 or similar).

Table 5. Species list and approximate density per acre^{5,6}

Total trees per acre <40			
Genus	Species	Common	Recommended Density (/ac)
<i>Acacia</i>	<i>koaia</i>	koaia	<40
<i>Aleurites</i>	<i>moluccana</i>	kukui	<10
<i>Alphitonia</i>	<i>ponderosa</i>	kauila	<10
<i>Artocarpus</i>	<i>altilis</i>	ulu, breadfruit	<10
<i>Calophyllum</i>	<i>inophyllum</i>	kamani	<40
<i>Cocos</i>	<i>nucifera</i>	niu, coconut	<40
<i>Cordia</i>	<i>subcordata</i>	kou	<40
<i>Diospyros</i>	<i>sandwicensis</i>	lama	<40
<i>Erythrina</i>	<i>sandwicensis</i>	wili wili	<5
<i>Meterosideros</i>	<i>polymorpha</i>	ohia	<40
<i>Musa</i>	sp. Hybrid	maia, banana	<20 (clumped)
<i>Nestegis</i>	<i>sandwicensis</i>	olopua	<40
<i>Pandanus</i>	<i>tectorius</i>	hala	<10
<i>Pleomele</i>	spp.	halapepe	<20
<i>Thespesia</i>	<i>populnea</i>	milo	<40

Total shrubs per acre 100 - 200		
Genus	Species	Common
<i>Broussonetia</i>	<i>papyrifera</i>	wauke
<i>Ceasalpinia</i>	<i>pulcherrima</i>	ohai alii
<i>Chenopodium</i>	<i>oahuense</i>	aweoweo
<i>Cordyline</i>	<i>fruticosa</i>	ki, ti
<i>Dodonaea</i>	<i>viscosa</i>	aalii
<i>Lageneria</i>	spp.	ipu
<i>Morinda</i>	<i>citrifolia</i>	noni
<i>Osteomeles</i>	<i>anthyllidifolia</i>	ulei
<i>Piper</i>	<i>methysticum</i>	awa
<i>Saccharum</i>	<i>officinarum</i>	ko, sugar cane
<i>Sida</i>	<i>fallax</i>	ilima
<i>Touchardia</i>	<i>latifolia</i>	olona
<i>Vitex</i>	<i>rotundifolia</i>	pohinahina
<i>Wikstroemia</i>	spp.	akia

Total groundcovers per acre 200 - 300		
Genus	Species	Common
<i>Asplenium</i>	spp.	fern
<i>Colocasia</i>	<i>esculenta</i>	kalo
<i>Curcuma</i>	<i>domestica</i>	olena
<i>Dioscorea</i>	<i>alata</i>	uhi
<i>Heteropogon</i>	<i>contortus</i>	pili
<i>Ipomoea</i>	<i>batatas</i>	uala
<i>Nephrolepis</i>	<i>cordifolia</i>	kupukupu
<i>Oxalis</i>	<i>corniculata</i>	ihi ai
<i>Pteris</i>	spp.	fern
<i>Tacca</i>	<i>leontopetaloid</i>	pia
<i>Waltheria</i>	<i>indica</i>	uhaloa

⁵ The ecological classification for Lowland Mesic Forest can be consulted for further species recommendations (NatureServe, 2009).
⁶<http://pubs.usgs.gov/of/2012/1192/>, this publication by USGS can be referenced for further recommendations by locale.

5.6. Mulching (NRCS code 484)

Mulching includes the use of various methods to suppress competition prior to and after plantings. Various methods are proposed for the site, dependent on the availability of materials and efficacy of results. They include:

- Black sheet mulching (reused as sites are established)
- Cardboard (as sheet mulch)
- Traditional clean mulch at an application of a minimum depth of 2-inches

5.7. Weed Control (NRCS code 314, 327)

Taking into consideration the landowners adverse reaction to herbicide, shade canopy will be the primary prescription to control understory invasive weed species. The weed control prescription is designed to release the restoration plantings by removing the shade and competition of the overstory of Formosa koa as the native plants grow. This operation will occur intermittently and as required based on the vegetative growth rates of the understory. In conjunction with the canopy cover, manual and mechanical control will be required to remove and/or control intermediate invasive weeds. Tools to accomplish this task may consist of but not limited to, brush cutters, chainsaws, pole saws, picks and loppers. Another prescription is mulching around the seedlings, using the methods proposed in **Section 5.6**, of which will be tested for cost effectiveness.

Ongoing weed control maintenance will be necessary for post-planting competition control until native vegetation canopy has closed. Three to four competition control entries are anticipated per year (0.6 acres), as the project progresses the maintenance areas will increase. A rigorous plan of maintenance should be followed during wet times of the year to keep weeds from out competing native plants. The overarching objective, however, is to maintain a clean growing site for early plant development.

5.8. Forest health and protection (NRCS code 666)

The primary concern to forest health now is the presence of pigs throughout the property. Although they have been managed in the past, they require ongoing trapping, removal and monitoring, especially given the upcoming restoration.

Traps will continue to be used and maintained by the Oahu Pig Hunters Association. In addition, the use of game cameras placed in strategic locations will provide important data on population trends. The data collected monthly from the game cameras will provide feedback to management to either increase, reduce or continue the same level of pig trapping/hunting pressure.

Wildfire mitigation will also be practiced to protect the restoration area. A fuelbreak will be maintained at the width of approximately twice the height of adjacent vegetation along the fenceline, which utilized the area cleared for installing the fence. Keeping this area clear will also help maintain the fence.

5.9. Ecological monitoring (NRCS code 595)

Some degree of ecological monitoring is an important component of forest management. For the scale of tree planting proposed in this Forest Stewardship Management Plan, the landowner can maintain an effective monitoring program by conducting a quantitative assessment one per year by simply counting seedlings which have survived and comparing this number to the seedlings planted within the 0.3-acre forest restoration cells. A progress statement of performance that includes overall percent survival of reforested cell and photos should be documented. This will provide feedback on the efficacy of prescriptions.

The perimeter fence around the restorations area will require ongoing monitoring and maintenance to ensure ungulates (principally feral pigs) are excluded from the project area.

Although zoological monitoring is beyond the scope of this management plan, the landowner may implement an ancillary or passive zoological monitoring program to track observations as vegetation composition changes.

6. Budget and Schedule

The preceding management prescriptions are planned around a specific budget and implementation schedule based around the patchwork protocol. Each prescription is assigned to a corresponding USDA NRCS code, and is given a per-unit cost. Costs for site preparation, establishment, pruning, protection and monitoring are calculated on a per-acre basis. Costs of seedlings are calculated per individual plant, and costs of fencing, irrigation and mulching are calculated on a unit cost per feet or square feet. An annual budget for each of ten (10) years is provided below in **Table 6**. A detailed budget is presented for the first year of the project with a monthly schedule of work and expenditures. **Budgets have been prepared such that operational costs are allocated by year. The total project budget is \$110,652 (not including the management plan component) for ten years, or an average of \$11,000 per year.**

Table 6. Annual budget expenditures to implement restoration in the context of this Forest Management Plan. Operational

costs in the first year of the project will be greater due to fence construction and irrigation.

Yearly Activities Schedule & Budget	Total Cost	Year										
		1	2	3	4	5	6	7	8	9	10	
Fence construction	\$15,200	\$15,200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Tree/Shrub site prep.	\$9,600	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960	\$ 960
Irrigation	\$15,600	\$ 6,240	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040	\$ 1,040
Mulching	\$17,550	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755	\$ 1,755
Tree/Shrub estab.	\$3,288	\$ 1,884	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156	\$ 156
GC estab. seedlings	\$6,760	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676	\$ 676
Weed control	\$39,600	\$ 720	\$ 1,440	\$ 2,160	\$ 2,880	\$ 3,600	\$ 4,320	\$ 5,040	\$ 5,760	\$ 6,480	\$ 7,200	\$ 7,200
Forest Health	\$2,500	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
Monitoring	\$554	\$ 90	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52	\$ 52
Subtotal:	\$27,775	\$ 6,329	\$ 7,049	\$ 7,769	\$ 8,489	\$ 9,209	\$ 9,929	\$10,649	\$11,369	\$12,089	\$12,809	\$13,529
Applicant share:	\$13,888	\$ 3,164	\$ 3,524	\$ 3,884	\$ 4,244	\$ 4,604	\$ 4,964	\$ 5,324	\$ 5,684	\$ 6,044	\$ 6,404	\$ 6,764
FSP Share:	\$13,888	\$ 3,164	\$ 3,524	\$ 3,884	\$ 4,244	\$ 4,604	\$ 4,964	\$ 5,324	\$ 5,684	\$ 6,044	\$ 6,404	\$ 6,764
Applicant running total:	\$13,888	\$ 17,052	\$20,576	\$24,460	\$28,705	\$33,309	\$38,273	\$43,598	\$49,282	\$55,326	\$61,652	\$68,176
FSP running total:	\$13,888	\$ 17,052	\$20,576	\$24,460	\$28,705	\$33,309	\$38,273	\$43,598	\$49,282	\$55,326	\$61,652	\$68,176
Running total:	\$27,775	\$ 34,104	\$41,152	\$48,921	\$57,409	\$66,618	\$76,547	\$87,195	\$98,564	\$110,652	\$122,828	\$135,352

Table 7. Monthly work schedule and expected budget expenditures. Beside fence construction this work schedule should be replicated each budget year in the same order, however actual budget figures may change according to required workload.

Monthly Activity Schedule & Budget	Cost unit ⁻¹	# Unit	Unit	Month															
				1	2	3	4	5	6	7	8	9	10	11	12				
Fence construction	\$9.50	1,600	feet	\$15,200	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Tree/Shrub site prep.	\$1,600	0.6	acres	\$ -	\$ 480	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 480	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Irrigation	\$6.50	240	feet	\$ -	\$ -	\$ 3,120	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,120	\$ -	\$ -	\$ -	\$ -	\$ -
Mulching	\$0.75	2,340	sq.ft	\$ -	\$ -	\$ 878	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 878	\$ -	\$ -	\$ -	\$ -	\$ -
Tree/Shrub estab.	\$12.00	157	seedlings	\$ -	\$ -	\$ -	\$ 942	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 942	\$ -	\$ -	\$ -	\$ -
GC estab. seedlings	\$6.50	104	seedlings	\$ -	\$ -	\$ -	\$ 338	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 338	\$ -	\$ -	\$ -	\$ -
Weed control	\$1,200	0.6	acres	\$ -	\$ -	\$ -	\$ -	\$ 720	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 720	\$ -	\$ -
Forest Health	\$417	0.6	acres	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 125	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 125
Monitoring	\$150	0.6	acres	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 45	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 45
Subtotal:				\$15,200	\$ 480	\$ 3,998	\$ 1,280	\$ 720	\$ 170	\$ -	\$ -	\$ 480	\$ 3,998	\$ 1,280	\$ 720	\$ 170	\$ -	\$ -	\$ -
Applicant share:				\$ 7,600	\$ 240	\$ 1,999	\$ 640	\$ 360	\$ 85	\$ -	\$ -	\$ 240	\$ 1,999	\$ 640	\$ 360	\$ 85	\$ -	\$ -	\$ -
FSP Share:				\$ 7,600	\$ 240	\$ 1,999	\$ 640	\$ 360	\$ 85	\$ -	\$ -	\$ 240	\$ 1,999	\$ 640	\$ 360	\$ 85	\$ -	\$ -	\$ -
Monthly subtotal:				\$15,200	\$ 480	\$ 3,998	\$ 1,280	\$ 720	\$ 170	\$ -	\$ -	\$ 480	\$ 3,998	\$ 1,280	\$ 720	\$ 170	\$ -	\$ -	\$ -
Running total:				\$15,200	\$15,680	\$19,678	\$20,958	\$21,678	\$21,848	\$21,848	\$21,848	\$22,328	\$26,325	\$ 27,605	\$28,325	\$ 28,495	\$ -	\$ -	\$ -

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