GRANT AGREEMENT FOR THE WEST MAUI MOUNTAINS WATERSHED PARTNERSHIP SOURCE PROTECTION PROGRAM BETWEEN THE COUNTY OF MAUI AND THE UNIVERSITY OF HAWAII

THIS AGREEMENT made and entered this _____ day of _____, 2016, by and between the COUNTY OF MAUI, a political subdivision of the State of Hawaii, through its DEPARTMENT OF WATER SUPPLY (hereinafter "County" or "DWS"), whose principal place of business and mailing address is 200 South High Street, Wailuku, Maui, Hawaii 96793, and THE UNIVERSITY OF HAWAII, (hereinafter "UH"), an organization of the State of Hawaii (hereafter "State"), through its OFFICE OF RESEARCH SERVICES (hereinafter "ORS"), whose principal place of business is 2425 Campus Road, Sinclair Library Rm. 1, Honolulu, Hawaii 96822 and mailing address is 2440 Campus Road, Box 368, Honolulu, Hawaii 96822.

WITNESSETH:

WHEREAS: The West Maui Mountains Watershed Partnership (WMMWP) was created in 1998, making it the second-oldest Watershed Partnership in the State; WMMWP manages 47,321 acres of the West Maui Mountains, also known as Mauna Kahalawai;

WHEREAS: The WMMWP is a partnership of West Maui mountain land owners, formed for the purpose of jointly managing and protecting West Maui mountains watershed lands in West Maui; Habitat altering weeds and feral ungulates are among the most serious threats to the West Maui Watershed;

WHEREAS: The WMMWP has prepared a Watershed Management Plan, which include such measures as fencing, feral ungulate control and weed management; This Plan is part of a joint management effort between the members of the WMMWP for management and protection of the West Maui mountains watershed;

WHEREAS: WMMWP members all stand to benefit from preventing damage by feral animals and invasive plants to the subject watershed lands;

WHEREAS: Over the last 17 years, WMMWP's achievements in animal control, weed control, and integration of new technologies like Herbicide Ballistics Technology (HBT) alongside data collection, monitoring, public outreach and volunteer stewardship programs have furthered the protection of the watershed and native ecosystems to benefit and improve our water supply; and

WHEREAS: Consumers of water from the water delivery systems of the West Maui Mountains Watershed Partners also stand to benefit from their mutual protection of the subject watershed lands.

NOW THEREFORE, IT IS HEREBY AGREED, by and between DWS and UH-ORS that the proposal attached as Exhibit "A" is incorporated hereto, made a part hereof, and shall be implemented as follows:

I. Responsibilities of Parties

A. DWS Responsibilities:

1. DWS shall contribute grant funds for the implementation of the proposal attached as Exhibit "A", and shall provide payment of up to $350,000.00 to UH-ORS for services rendered as described in the attached proposal and summarized in 1.B below.
2. DWS staff shall consult on and provide information, as needed, to assist in implementation of the proposal attached as Exhibit "A".

B. UH-ORS Responsibilities:

UH-ORS shall implement the proposal attached as Exhibit "A", and shall exert the care and consideration necessary to implement the proposal in a safe and responsible manner. Deliverables under this portion of the agreement include:

a. Maintenance and Inspection of Fences

- Inspect 7.6 miles of fence (ranging from annual to quarterly checks)
- Repair and maintain fences as needed

b. Ungulate Control Program

- Check all ungulate traps (ranging from annual to quarterly checks)
- Update check and capture maps
- Ground scout in ungulate free areas for early detection
- Ground scout – rapid response in new hotspot areas

c. Control of Priority Weed Species

- Follow up treatment and assessment of Herbicide Ballistics Technology (HBT) treated strawberry guava
- Ground control efforts – maintain prior weed control treatment areas throughout the watershed by controlling regenerating trees or seedlings from the seed bank
- Facilitate dispersal of the strawberry guava biocontrol, *Tectococcus ovatus* to four (4) more sites on State land within WMMWP
- Conduct 6 volunteer service days to control *P. cattleianum* and other weeds on Waihe'e Ridge trail, Kapunakea Preserve or similar areas of high interpretive and watershed values
- Out-plant native species in previously treated areas
- Continue to monitor and control *Clidemia* population on Wahikuli Ridge and Iao Valley
- Sweep buffered area around known locations
- Control other priority species encountered during the course of other work

- Prevent incipient weed establishment by continuing strict decontamination procedures
- Support Maui Invasive Species Committee (MISC) by informing them of any new priority weed locations

d. Watershed Monitoring Program

- Annually monitor up to 27 ungulate transect segments
- Annually monitor third (1/3) of watershed for presence of invasive weeds on transects
- Monthly check of a Yellow Springs Instrument Company (YSI) turbidity sonde and rain gauge in Honolua
  - monitor 10 erosion bridges annually
  - collect water samples as needed
- Forest Health Observations and Monitoring
  - report incidental observations of forest health to aid in the understanding of forest threats
  - report rare species to the Plant Extinction Prevention Program (PEPP)
- Photo/Vegetation Plot Monitoring - annually monitor one-third (1/3) of watershed with photo/vegetation plots to compare vegetation growth and composition from year to year
- Aerial Surveys – conduct aerial surveys to cover unfrequented lands in search of watershed threats

e. Public Education and Awareness Program

- Maintain website, brochure, newsletter and update outreach booth visuals
- Conduct eight (8) WaterStory sessions
- Participate in five (5) community outreach events

II. Notices

In the event that any party wishes to initiate cancellation or changes to provisions of this Agreement, notice shall be provided to the other party in writing. Any notice by any party to the other shall be in writing and shall be personally delivered or sent by certified or registered mail as follows:

David Taylor, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Maui, HI 96793

Yaa-Yin Fong, Director
Office of Research Services - University of Hawaii
2440 Campus Road, Box 368
Honolulu, Hawaii 96822

III. Payment

A. Payment shall be made by DWS to UH-ORS in four installments, upon submission of invoices (and supporting documentation) for expenses incurred. All requests for payment shall include both programmatic and financial progress reports.

B. The first request for payment shall be invoiced no earlier than ninety (90) days from the date of the Notice to Proceed and shall not exceed 20 percent of the total grant amount.

C. The second request for payment shall be invoiced no earlier than 180 days from the date of the Notice to Proceed and combined with the first request for payment shall not exceed 50 percent of the total grant amount.

D. The third request for payment shall be invoiced no earlier than 270 days from date of the Notice to Proceed and combined with the first and second requests for payment shall not exceed 75 percent of the total grant amount.

E. The fourth and final request for payment shall be made upon satisfactory completion of the Project and shall include the balance of funds due. The final request for payment shall be made no earlier than 365 days and no later than 455 days from the date of the Notice to Proceed. Should a six (6) month no cost extension be granted, final request for payment shall be invoiced no later than thirty (30) days after the extension period. The final report shall include a disk with copies of the map layers generated by the Project, and any other work deliverables as indicated in the proposal.

F. UH-ORS shall retain copies of documentation for a period of three (3) years after completion of this Agreement required to substantiate all expenditures and shall make such documentation available to DWS for inspection or audit upon request.

G. Expenditures shall be made in accordance with the budget for the project contained in Exhibit "A", and shall apply to the work items summarized above in I.B.

IV. Indemnification

The State shall be responsible for all damages, injury, or death caused by the State's officers, employees, volunteers, and agents, in the course of their employment, services, and/or activities under this Agreement, to the extent that the State's liability for such damage, injury, or death has been determined by a court of competent jurisdiction or otherwise agreed to by the State, and the State shall pay for such damages, injury, or death to the extent permitted by law. Further, to the extent permitted by law, the State shall indemnify, defend, release, and hold harmless the County, its officers, agents, and employees, from and against any and all actions and claims arising, either directly or indirectly, out of or resulting from the errors, omissions, or acts of the State, its officers, employees, volunteers, or agents, occurring during or in connection with the performance of the State's services under this Agreement. This indemnification agreement is intended to be as broad and inclusive as permitted by the laws of the State

of Hawaii and if any portion is held invalid, the balance shall notwithstanding continue in full force and effect.

V. Time of Completion

Work under this Agreement shall be performed within twelve (12) months from the date of the Notice to Proceed. Should there be extenuating circumstances (i.e. weather, seasonal, etc.), UH-ORS shall be given an extension not to exceed six (6) months. Request for extension shall be submitted to DWS in writing ninety (90) days prior to the end of the Project period.

VI. Rights and Responsibilities

The rights and responsibilities of each party described herein shall remain in force and effect until such time as each party's Project responsibilities are completed.

VII. Successors and Assignees

All terms, conditions, provisions, warranties and covenants contained herein shall apply to and bind the respective successors and assignees of the parties hereto.

VIII. General Terms and Conditions

The General Terms and Conditions attached hereto as Exhibit "B" shall be incorporated and made a part of this Agreement.

IX. Agreement Voluntary

It is hereby expressly understood and agreed that this Agreement has been freely and voluntarily entered into by the parties and this Agreement cannot be altered, amended, modified or otherwise changed except in writing executed by a duly authorized representative of each of the undersigned.

X. Exhibits

Exhibits "A" and "B" are attached hereto and incorporated herein by this reference:
"A" - FY 2017 Proposal from West Maui Mountains Watershed Partnership – UH-ORS
"B" - General Terms and Conditions - DWS Grants

COUNTY:
COUNTY OF MAUI

By _____
ALAN. M. ARAKAWA
Mayor

GRANTEE:
OFFICE OF RESEARCH SERVICES - UNIVERSITY OF HAWAII

By_____
YAA-YIN FONG
Director

APPROVAL RECOMMENDED

_____

SANANDA K. BAZ
Budget Director

_____

DANILO F. AGSALOG
Director of Finance

_____

DAVID TAYLOR
Director of Water Supply

APPROVED AS TO FORM AND LEGALITY:

_____

JENNIFER M.P.E. OANA
Deputy Corporation Counsel
County of Maui

STATE OF HAWAII)
) SS.
COUNTY OF MAUI)

On this _____ day of _____, 20__, before me appeared ALAN M. ARAKAWA, to me personally known, who being by me duly sworn did say that he is the Mayor of the County of Maui, a political subdivision of the State of Hawaii, and that the seal affixed to the foregoing instrument is the lawful seal of the said County of Maui, and that the said instrument was signed and sealed in behalf of said County of Maui by authority of its Charter, and the said ALAN M. ARAKAWA acknowledged the said instrument to be the free act and deed of said County of Maui.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public, State of Hawaii

Print Name:_____

My commission expires:_____

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STATE OF HAWAII)
) SS.
)

On this _____ day of _____, 20_____, before me personally appeared _____, to me personally known, who, being by me duly sworn or affirmed, did say that such person executed the foregoing instrument as the free act and deed of such person, and if applicable, in the capacity shown, having been duly authorized to execute such instrument in such capacity.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public, State of Hawaii
Print Name:_____
My commission expires:_____

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A. PROJECT BACKGROUND

The West Maui Mountains Watershed Partnership (WMMWP) was created in 1998, making it the second-oldest Watershed Partnership in the State. With 11 land-owning Partners, including the County of Maui Department of Water Supply (DWS), and two associate Partners(Figure 1, page 3), the mission of WMMWP is to protect and preserve Maui's water supply and prevent further degradation through collaborative forest management—because a healthy native forest yields abundant fresh water. With the support of DWS and other Partners, our staff of local residents (Figure 2, page 4) works full time as stewards of our native forests to ensure a clean and sustainable drinking water supply for Maui Island.

Roughly 70 percent of the West Maui watershed, about 33,051 acres, is dominated by native Hawaiian forests which compose a giant living sponge that soaks up rainwater and lets it percolate through the vegetation and soils to recharge the groundwater supply in our aquifers and the surface water supply in our streams. Major threats to the watersheds that produce Maui's drinking water supply include: feral ungulates (hooved animals, namely pigs, goats, and deer) that degrade native forests and leach disease into our streams; invasive weeds that choke out native plants and inhibit aquifer recharge; human disturbances that spread weeds and cause erosion and runoff; and wildfires that transform moist native landscapes into dry alien plains. Left unchecked, these threats will severely degrade native forests and compromise the functional integrity of the watershed. Over time, a denuded watershed will yield diminished aquifer recharge, limited groundwater resources, turbid streams clouded with runoff, and polluted surface water.

Fortunately, over the last 17 years WMMWP's achievements in animal control, weed control, and integration of new technologies like herbicide ballistics technology (HBT) alongside data collection, monitoring, public outreach and volunteer stewardship programs have furthered the protection of the watershed and native ecosystems to benefit and improve our water supply. In doing so, WMMWP has collaborated with other local organizations like Maui Land & Pineapple Company's Pu'u Kukui Watershed Preserve, The Nature Conservancy in Kapunakea Preserve, the Maui Invasive Species Committee, and the Plant Extinction Prevention Program. Ongoing support from the County of Maui and DWS in particular has been integral to the success of WMMWP. It is hoped that this relationship continues for the preservation, protection, and sustainability of Maui's drinking water supply.

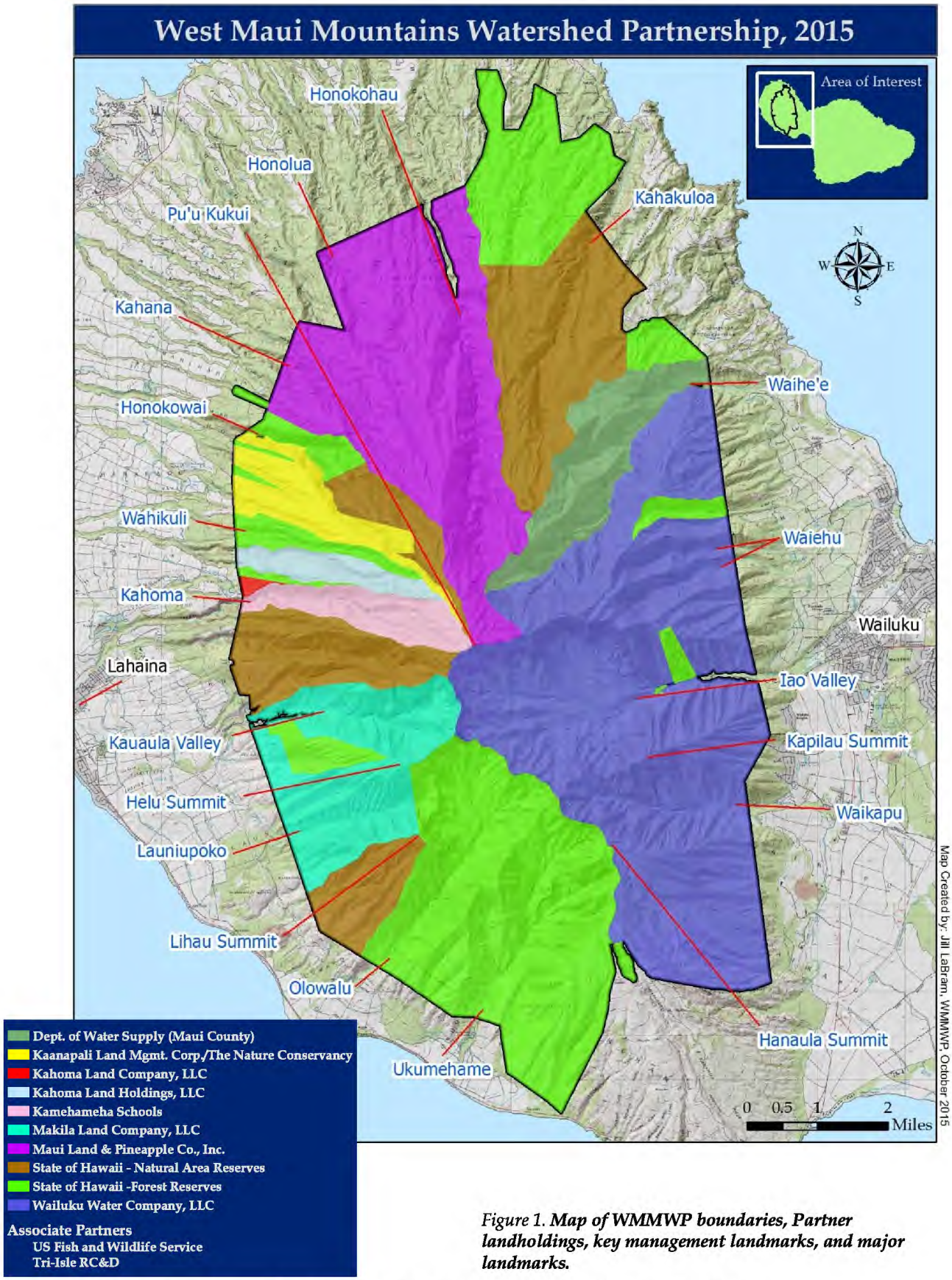


Figure 1. ***Map of WMMWP boundaries, Partner landholdings, key management landmarks, and major landmarks.***

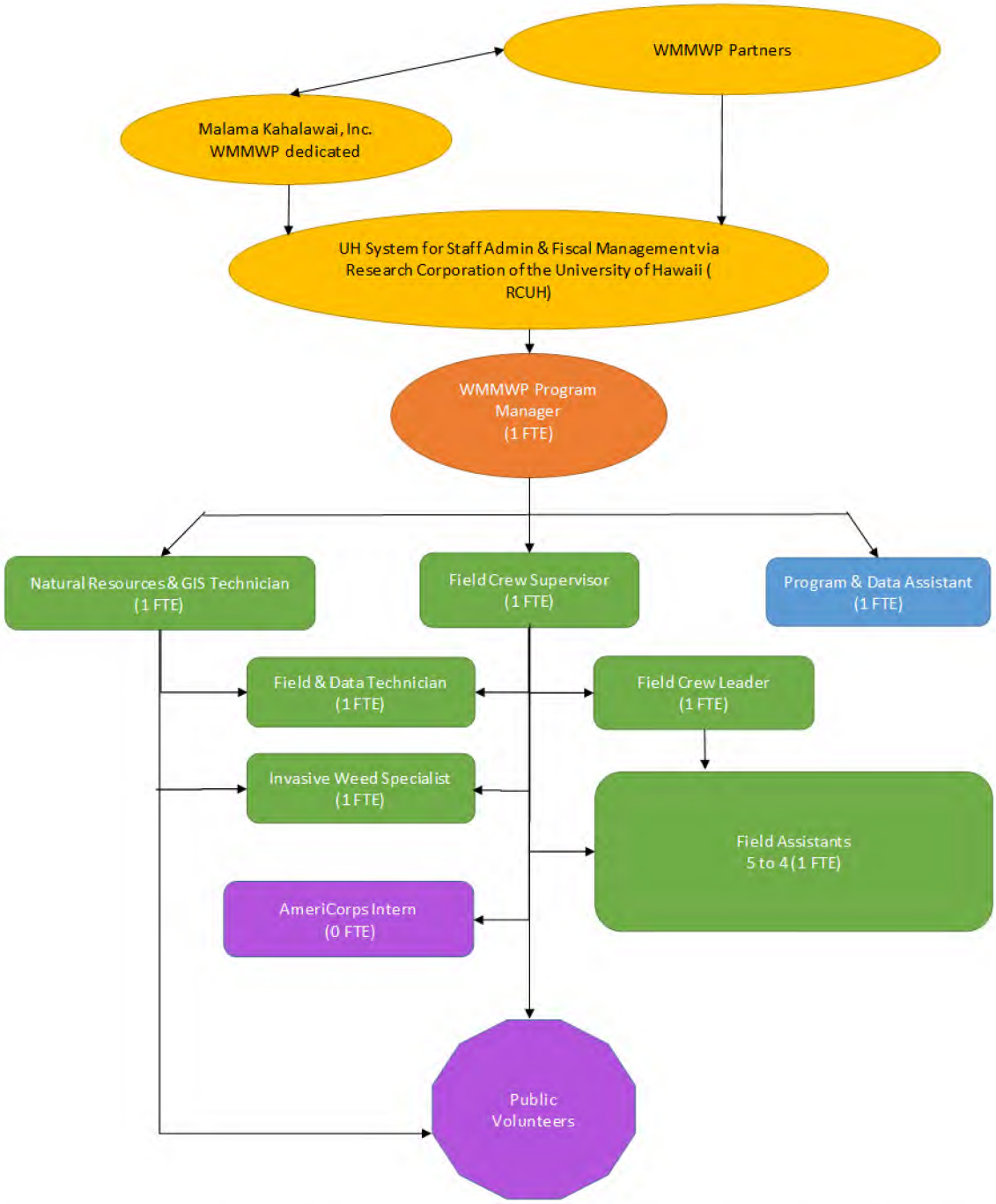


Figure 2. WMMWP Organizational Chart. The figure above depicts the governance, administration and implementation of programs through staff positions and volunteers. WMMWP partners and landowners provide the ultimate direction while the University of Hawaii system and WMMWP's non-profit, Malama Kahalawai, provide the fiscal, legal and administrative support for staff that implement WMMWP management plan priorities.

B. PROJECT GOALS AND OBJECTIVES

The program activities we propose for the 2017 Watershed Grants Program are designed to further the mutual goal of protecting source water resources and ensure a sustainable drinking water supply for the people of Maui. We are guided by the overarching WMMWP Watershed Management Plan and the corresponding WMMWP Weed Management Plan. The Watershed Management Plan details goals, objectives, actions and budgets necessary to protect watershed resources through 2018. The Weed Management Plan functions in tandem with the Watershed Management Plan to strategize the control of the most invasive weed species that threaten the functional integrity of the watershed. Priority programs addressed by this proposal include: fence maintenance and inspections, ungulate control, control of priority weed species, watershed and water quality monitoring, and public education and awareness.

Photo of native forest understory. Courtesy: Forest and Kim Starr.

Goal 1: Maintenance and inspection of fences to prevent new invasions of feral ungulates into protected watershed lands. Ungulate exclosure fences are *the first* line of defense in natural resource management. Constant pressure from incoming ungulates and vulnerable breaks from tree fall and vandalism necessitate active upkeep to bolster this line of defense. Additional fence lines require more time and energy for inspection and maintenance to ensure continued absences of ungulates in fenced areas.

- Objective 1: Maintain approximately 7.6 miles of fence—2.1 miles *more* than our FY16 scope of work, a 28% increase—that protect 16,741 acres of our designated DWS priority forested watersheds that contain groundwater and surface water recharge areas.
- Short-term benefits include rapid response to close potential ingress points.
- Long-term benefits include continued absence of ungulates within fenced units to facilitate native ecosystem recovery and protect recharge areas.

Goal 2: Ungulate control program to manage 16,741 acres of our designated DWS priority watersheds—2,459 *more* acres than our FY16 scope, a 17% increase in acres that are at or near zero ungulate activity. With fences in place to inhibit new invasions, removal of existing ungulates within fenced areas is the next step in protecting watershed resources against further damage. Vigilant efforts have led to successes in control, maintaining ungulate activity in all management units at a new record low.

- Objective 1: Conduct regular trap checks to ensure consistent and effective removal of ungulates.
- Short-term benefits include reduced ungulate populations and diminished impacts.

- Long-term benefits include achieving a level of zero ungulates in fenced areas to prevent further destruction of watershed resources, minimize health risks from diseases such as Leptospirosis and Giardia and decreases in water quality caused by ungulate induced erosion and result in dirty turbid water, and enable re-vegetation of previously disturbed areas. Maintaining the purity of the water at the source reduces costs of purifying at DWS water collection facilities.

Goal 3: Control of priority weed species to halt further colonization of native forest lands by aggressive weeds that hog water and choke out native species. At the conclusion of FY15 we have defined our current weed management footprint to encompass 4,076 acres. This area represents the front lines or working zone between unmanaged areas and priority weed free areas. Managed areas will need to be rechecked to ensure weed removal and once deemed successful, expanded to improve more watershed area. Left unchecked, invasive species grow into expansive thickets that promote runoff, erosion and reduce groundwater recharge. With vigilant ungulate control efforts now maintaining ungulate disturbance at a minimum, we now progress towards elevating our weed control efforts by targeting more habitat-modifying species than ever before. WMMWP has been making gains in this area and has further defined problems species; however, we need more capacity to adequately deal with the complexity of weed dynamics and implement the next stages of our Weed Management Plan.

- Objective 1: Strawberry guava control:
  - Maintain previously controlled areas in key recharge areas of Iao and Waiehu and Panaewa and Kanaha to combat regeneration of treated plants and new growth from the seed bank.
  - Facilitate further dispersal of the biological control (biocontrol) agent that will substantially advance our ability to control the species.
  - Continue volunteer efforts on Waihe'e Ridge to prevent spread of the species into DWS lands.
- Objective 2: Control satellite populations of *Clidemia* in Lahaina and Iao Valley that threaten source water recharge areas. This species diminishes native ground cover and chokes our regenerating native forest.
- Objective 3: Implement a Weed Management Specialist position to focus on effectively implementing strategies defined by our Weed Management Plan. With a myriad of species taking root across our nearly 50,000-acre landscape, a dedicated specialist will be critical in advancing our weed control goals.
- Objective 4: Opportunistically treat other priority species when encountered to prevent new infestations.
- Short-term benefits include preventing the introduction of new weeds and halting the spread of established species.
- Long-term benefits include the ongoing protection of the pristine watershed core and the expansion of the weed-free core outward and makai from the summit.

Goal 4: Watershed monitoring program to monitor physical and biological resources, water resources, and threats to watershed health along with providing feedback on management success and informing future management strategies. This work is key to informing adaptive management and honing best management practices. A larger area protected by fence entails a larger area to monitor for threats to watershed health such as incipient weed and ungulate populations as well as signs of recovery like revegetation.

- Objective 1: Conduct annual ungulate and weed transects to monitor for new ungulate activity and presence of weeds, respectively. Utilizing GIS technology, we are able to aggregate transect data from successive years to map fluctuations in activity and species ranges to direct control efforts.
- Objective 2: Continue water quality monitoring in Honolua Stream to gather data that demonstrates the positive relationship between effective forest management and improved water quality.
- Objective 3: Record incidental observations of forest health during routine fieldwork to note locations of rare species or to catch incipient pests like Rapid Ohia Death and Erythrina gall wasp that threaten native species.
- Objective 4: Conduct photo point and vegetation plot monitoring to study and evaluate forest regeneration after removal of ungulates, weed dominance and other threats.
- Objective 5: Conduct aerial surveys to cover unfrequented lands in search of watershed threats.
- Short-term benefits include real-time snapshots of current watershed health, threats, and issues to address.
- Over the long-term, benefits include a robust database of monitoring data that can be synthesized to understand watershed dynamics and inform future management strategies.

Goal 5: Public education and awareness program to increase public awareness of the importance of watersheds for our water supply and educate community members about ways they can conserve water resources and advance watershed protection.

- Objective 1: Continue the use of social media and other media outlets to broaden our reach and keep watershed resources at the forefront of public consciousness.
- Objective 2: Continue to conduct educational sessions emphasizing the importance of watershed and water resources in partnership with the Maui Economic Development Board to engage a broad cross-section of residents from various schools and community groups in the importance of source water protection.
- Objective 3: Presence at community events like Arbor Day, Whale Day, etc. with an information booth to directly interact with different cross-sections of the public and again emphasize source water resource protection.
- Short-term benefits include increased public awareness of factors affecting watersheds and our island's water supply.
- Over the long-term, deepened public understanding of source water resources will translate into changes in behavior that protect watersheds and ensure an abundant water supply well into the future.

C. LOCATION AND SIZE OF PROJECT AREA

Photo of Waihe'e forest and headwaters. Courtesy: Air Maui

In total, WMMWP manages 47,321 acres of the West Maui Mountains, also known as Mauna Kahalawai. Pu'u Kukui, the summit of Mauna Kahalawai, is one of the wettest places on Earth, receiving up to 400 inches of rain each year (See Figure 3, Below). Beyond rainfall, native forests can capture up to 30 percent more water from fog drip in passing clouds. As such, the West Maui watershed is a key recharge area, producing 70 million gallons of water per day (MGD) of sustainable yield—over 25 billion gallons each year according to the State Commission of Water Resources Management! Notably, lands within the proposed management area encompass fog drip zones that capture additional water from passing clouds to further replenish surface and groundwater resources (See Figure 4, Page 9). Water from WMMWP lands in Mauna Kahalawai feeds around 76 percent of DWS customers, serving the Lahaina System (3,359 customers) as well as the Central and South Maui systems (20,264 customers). Figure 5 (Page10) illustrates the geographic relationship between the WMMWP management area and DWS water resources.

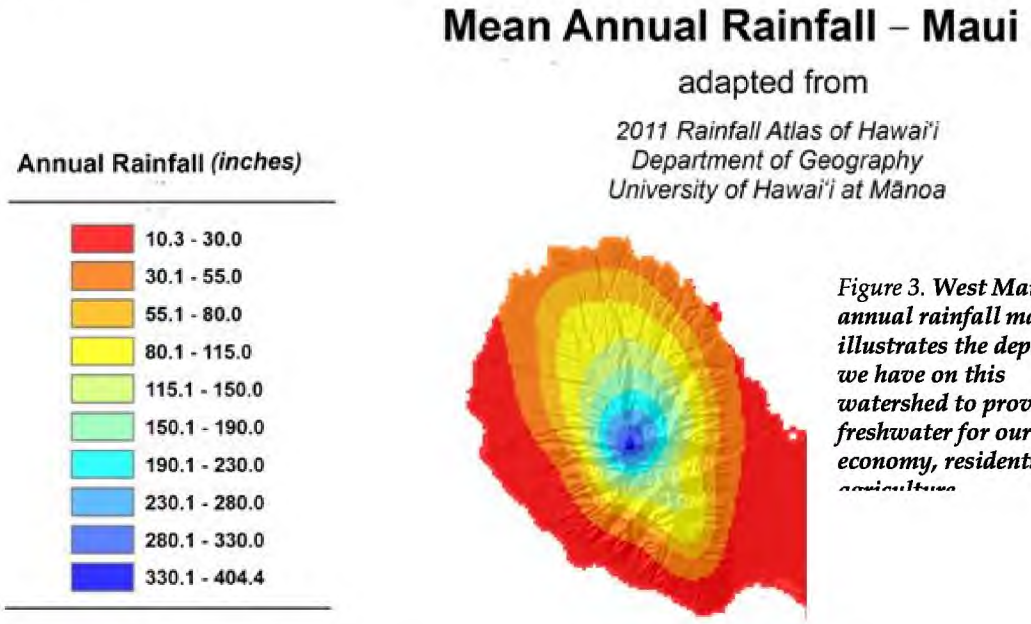


Figure 3. ***West Maui mean annual rainfall map illustrates the dependence we have on this watershed to provide freshwater for our economy, residents and agriculture***

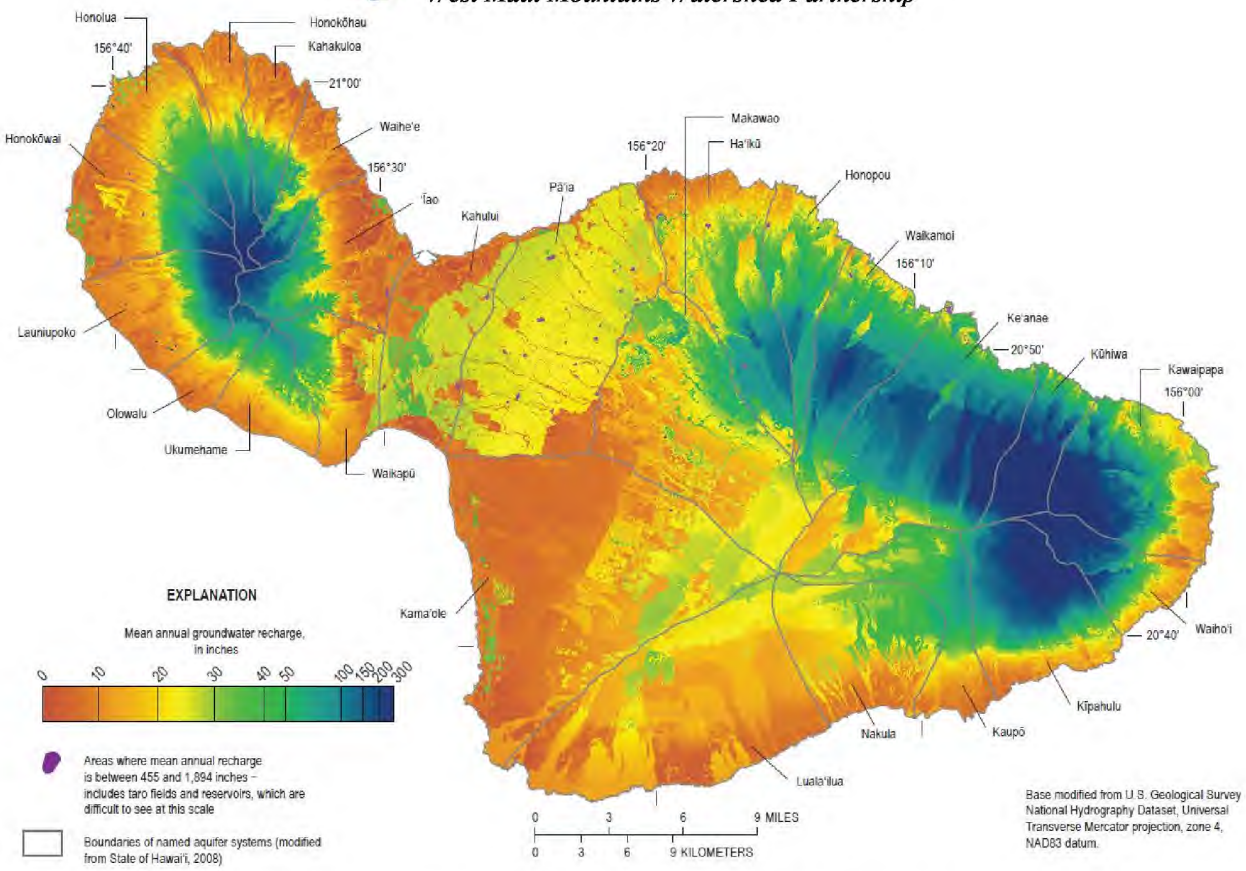


Figure 4. ***Groundwater recharge (average annual) on Maui Island from 1978 to 2007. As indicated by the blue and green areas, the core of Mauna Kahalawai is a key groundwater recharge area. Approximately 76 5 of DWS water comes from ground and surface source originating in the WMMWP protection area. Source: Johnson, et al., 2014.***

Our active management footprint has grown by over 10% in the past year, an addition of 5,186 acres that demand additional management resources. At the time of our original FY16 proposal, our management footprint covered 23,832 acres (50.4%) of the 47,321 acres in our partnership boundaries. Today, we actively manage 29,018 acres (61.3%) of our partnership lands behind ungulate ex-closure fences. With this proposed scope of work we aim to elevate the level of watershed protection across 16,741 acres of designated DWS priority watersheds, **an expansion of 2,459 acres from our FY16 scope or 17 % increase**.

Our proposed project area includes 2,001 acres of DWS land on the north side of Waihe'e River as well as a 3,301-acre DWS management easement across Wailuku Water Company land between Waihe'e River and South Waiehu Stream. Also included are lands spanning Iao and Waikapu that are mauka of DWS wells, streams, ditches, and wellhead protection areas. Water from these WMMWP-managed lands are directed to the Iao Water Treatment Facility to supply customers across Central and South Maui. On the west side, we will advance control programs in watersheds that generate ground and surface water for the Lahaina and Mahinahina Water Treatment Facilities which serve residents across West Maui (See Figure 6, Page 11). Our management efforts to enhance native forest coverage in these areas will contribute to increased aquifer recharge and help ensure the availability of fresh water for DWS.

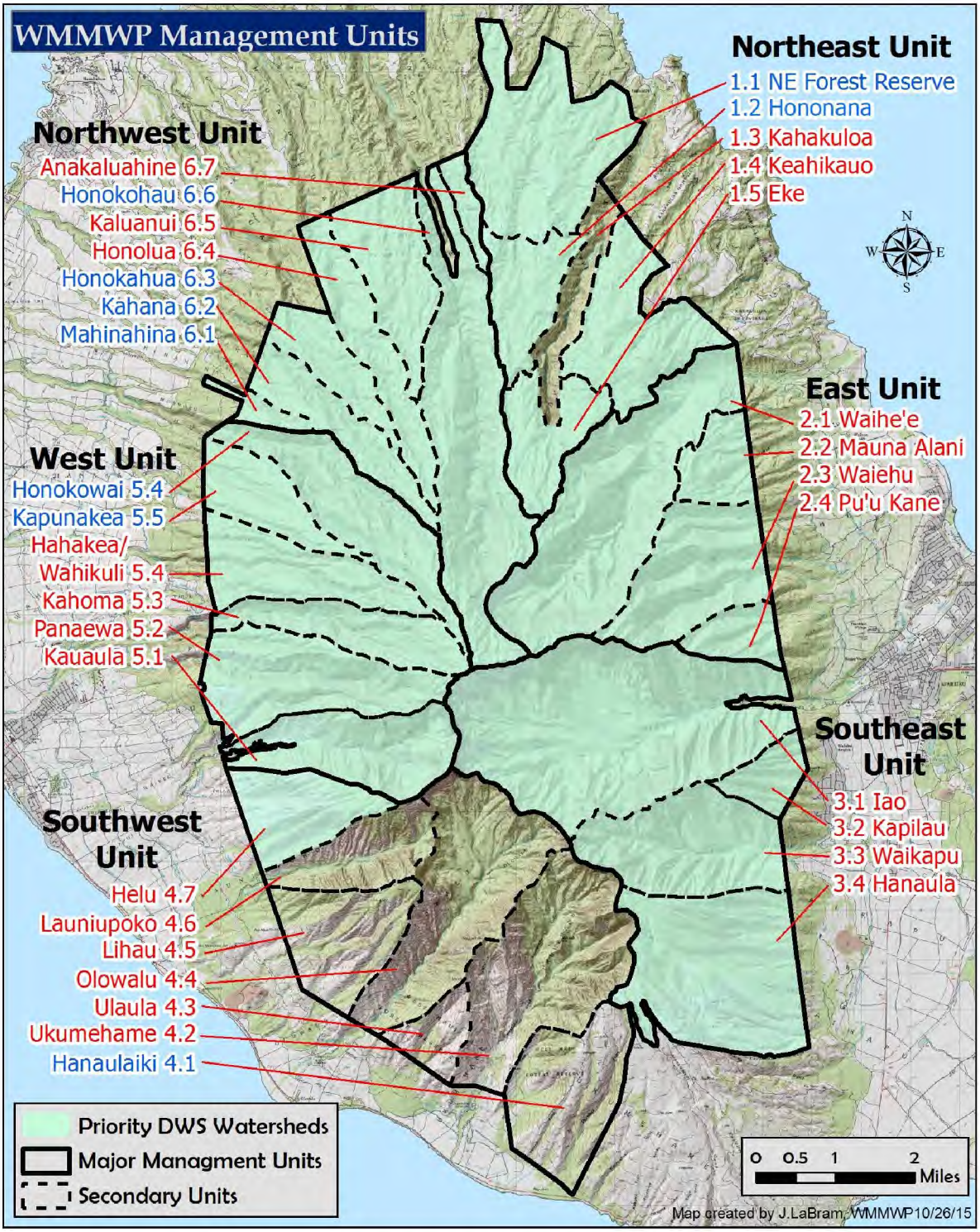


Figure 5. Map showing WMMWP management units and sub-units in relation to Partner land holdings. Sub-units labeled in red are those for which management activities are proposed under this proposal; those labeled in blue are excluded from this scope of work and are being addressed by other funds or partners. The light green shaded area shows our designated DWS priority watersheds.

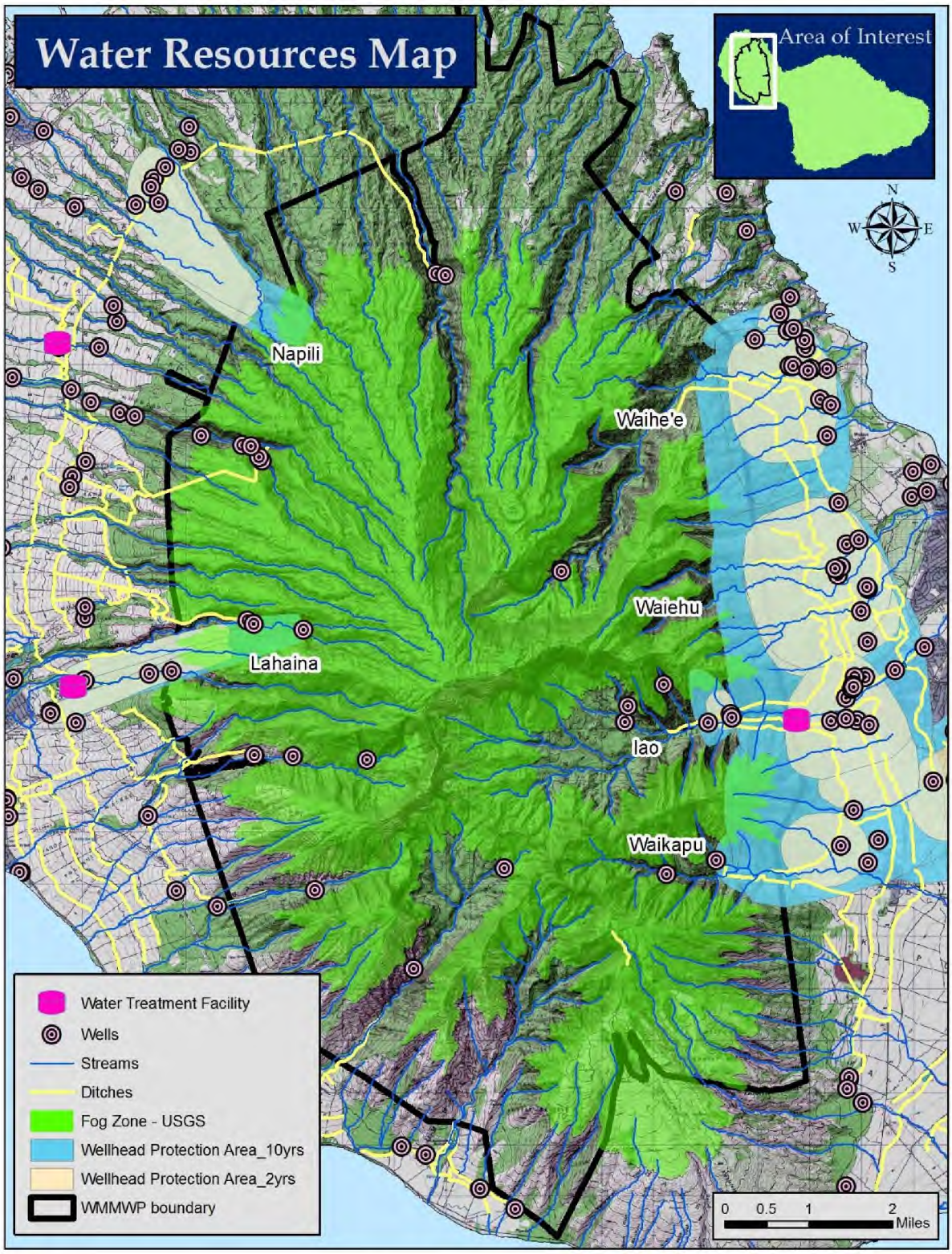


Figure 6. Map showing DWS water resources (water treatment facilities, ditches, wells, and wellhead protection areas), as well as the USGS fog zone, in relation to the WMMWP management area (outlined in black). The proposed scope of work and leveraged funds will protect watersheds located mauka of the Iao, Lahaina, and Mahinahina Water Treatment Facilities, as well as corresponding streams and wellhead protection areas. Management activities will contribute to recharge of the streams and aquifers that feed these DWS facilities.

D. SCOPE OF WORK

Through our program efforts in the past year, our active management footprint grew by over 10 percent to cover over 61 percent of our 47,321-acre management area. Given this growth, our management capacity must likewise expand programs to more fully protect resources through FY17 and beyond. With these expansions in mind, we propose an increased budget and scope of work to support continued and intensified efforts to protect priority native-dominated habitats and watersheds.

The proposed scope of work will be carried out by a crew of natural resource specialists who have attained high levels of education and experience in managing watersheds and forest resources. With decades worth of collective experience, the crew holds an irreplaceable wealth of institutional knowledge about species trends and landscape characteristics across the entire West Maui watershed. Crews are able to detect and distinguish old and new animal sign and identify a wide array of native and alien plants. Alongside their knowledge base, skills include proficiency with high-angle ropes and rappelling, use of hand and power tools, preparation and proper application of herbicide, aerial survey and identification from helicopter, and translating on-the-ground observations into GIS data. Crews are flexible enough to deploy in pairs or several-person teams and camp for days in remote, extremely variable climatic environments. These highly qualified crew members are the key to WMMWP's success in carrying out the following scope of work.

Maintenance and Inspection of Fences: Thus far, WMMWP staff and Partners have completed almost 22 miles of ungulate fence that protect 29,018 acres—about 61 percent of our watershed lands—from damage by feral ungulates. While the added length of fence protects new tracts of land, the new fences must be integrated into our inspection and maintenance schedules, necessitating additional capacity for this program. DWS has supported the construction of several miles of fence requiring inspections and contributed to the completion of 3 new segments this past year. Just like planting a new tree, constructing a fence is only the beginning of its life; proper maintenance is necessary to realize its true benefit.

Photo of fence line with denuded ungulate impacts on the left. This pressure on the fence requires vigilant inspections and maintenance to keep ungulates out and watersheds intact.

- *Task 1: Fence inspection:* Our goal is to inspect and maintain approximately 7.6 miles of fence (See Figure 7, Page 14) designed to protect 16,741 acres of our designated DWS priority forested watersheds as well as a host of rare species and habitats. Vigilance at this task protects fenced units from degradation by invading feral ungulates and minimizes the higher cost of later removing reestablished populations and rehabilitating the native forest complex. At minimum, all fences will be checked annually; however, problem areas require greater

frequency. Priority focus is on areas adjacent to DWS water facilities. Please refer to the color code on Figure 7 (Page 14) for check frequencies.

- *Task 2: Fence maintenance:* Critical tasks accomplished will depend on potential circumstances such as vandalism, tree fall, and other environmental factors. Actions include brushing fence lines, repairing holes with new wire material, extending or rerouting fences in failing areas, and recording all efforts. In some instances, landslides have forced the reconstruction of some fence segments.

Quantifiable Measures of Effectiveness:

- Measure 1: data on linear distance of fence line maintained, inspected, and repaired
- Measure 2: maps of work locations.
- Measure 3: photographic evidence of work performed
- Measure 4: descriptions of notable damage and repairs.
- Other measures may be found in the Watershed Monitoring section.

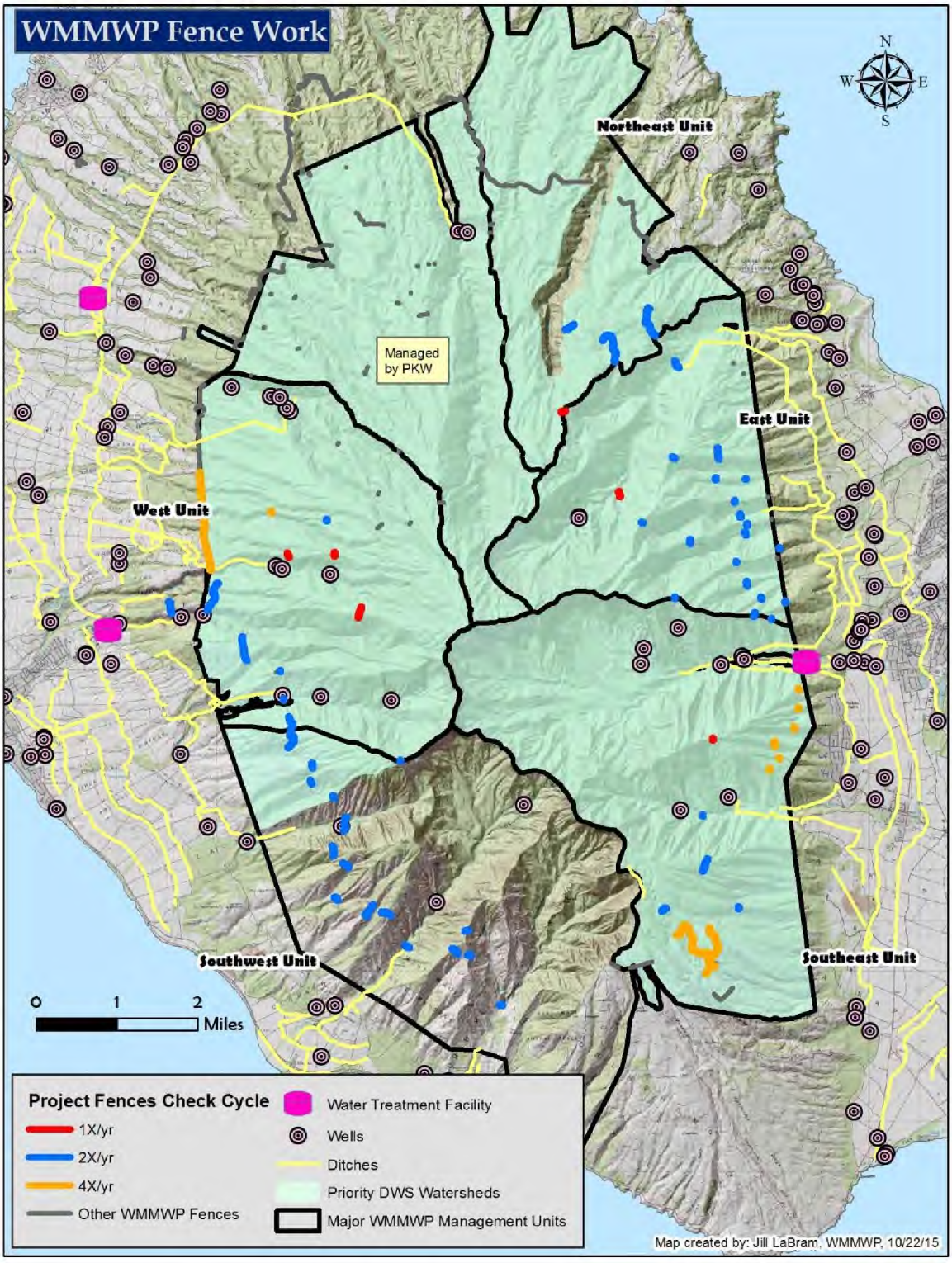


Figure 7. Map showing frequency of fence inspection and maintenance cycles across WMMWP lands. The 7.6 miles of fence that will be maintained under this grant are those located within the priority DWS watersheds area shaded in light green.

Ungulate Control Program: Once areas are protected by fences, ungulate control limits—and eventually halts—the spread of ungulate disturbances seen in the photos below. Subsequent monitoring quantifies the percentage of impacted land and vegetative recovery. Preventing reestablishment of ungulates requires continued vigilance. The cost of maintenance and prevention is minimal in comparison to the cost of removing secondary populations. The detrimental cost of unbridled ungulate disturbance is a permanent reduction in water collection function and a decline in water quality.

Photos of feral pig disturbance within the cloud forests of WMMWP. Such areas are eroded and then invaded by weeds which reduce the water collection function of the native forest. The levels have been up to 20% in some areas and is now near zero.

In the past, many areas within WMMWP had been devastated. Some stream valleys were denuded from wall to wall and transects were registering over 25% of the ground grubbed up across an entire ridge system. Today the impact averages ~1 tenth or 1 % due to management vigilance. Although this is a fantastic number, with only 13 animals responsible for the relatively minimal impact in FY15, the picture could be a whole lot worse. Using figures according to the Texas A&M Agriculture Extension Service (http://feralhogs.tamu.edu/frequently-asked-questions-wild-pigs/), should the 13 hogs not have been removed, they could have reproduced to become 208 after two reproductive cycles assuming full survivorship and that 50% were female with an average litter size was six. Furthermore, should 208 wild hogs have reached mature size of 185 lbs. on average, they would eat 5.55 lbs. of food a day or 2,025 lbs. of roughly 90% vegetation and 10% animal protein per year. Doing the math, 208 pigs' times 2,025 lbs. equals 421,200lbs. of biomass per year. While this may not be strictly applicable to the Hawaiian watershed, the point is that management vigilance should be considered important to maintaining this healthy system so that it does not quickly revert to its former disrepair.

To this end feral ungulates will continue to be controlled above project fences through trapping and the State aerial shoot program. Zero tolerance within fenced units is our overarching goal. WMMWP and its partners have dispatched over 2,500 ungulates since the early 1990s. To date, we have a total of 29,018 acres in active management and maintain those areas at near zero ungulate presence; within this proposal, we will manage 16,741 acres. Units have been kept near zero with only intermittent fence breaches calling for control of 13 ungulates across all managed areas in FY15. Figure 8 on the next page shows the problem areas within the watershed and the mounting pressure outside of fences by pigs, goats, and deer.

- *Task 1: Feral Ungulate Management*: Feral ungulate management will focus on DWS priority areas. "Maintenance" area traps are checked annually or biannually where there is little to no activity. "Active" area traps are checked quarterly where ungulate populations persist. See Figure 9 (Page 17) for a key to the frequency of checks per area. Following the recently completed fences discussed above, new traps have been installed in the added protection areas. It is critical that we garner additional resources to quickly secure this area against persistent ungulate populations.

  Note: To achieve the most efficient use of resources, ungulate control missions are often combined with fence inspection and maintenance missions or ungulate transect missions, since ungulate control groups are often situated between fences or along transect lines. This practice enables us to consolidate helicopter time as well as crew preparation and decontamination time.

Quantifiable Measures of Effectiveness:

- Measure 1: GIS maps and data on traps maintained, traps installed, number of ungulates dispatched and their locations.
- Measure 2: Comparison of capture numbers, activity levels, and transect % disturbance levels to prior years.
- Measure 3: An appraisal of project efficacy and lessons learned.
- Other measures are listed in the Watershed Monitoring section.

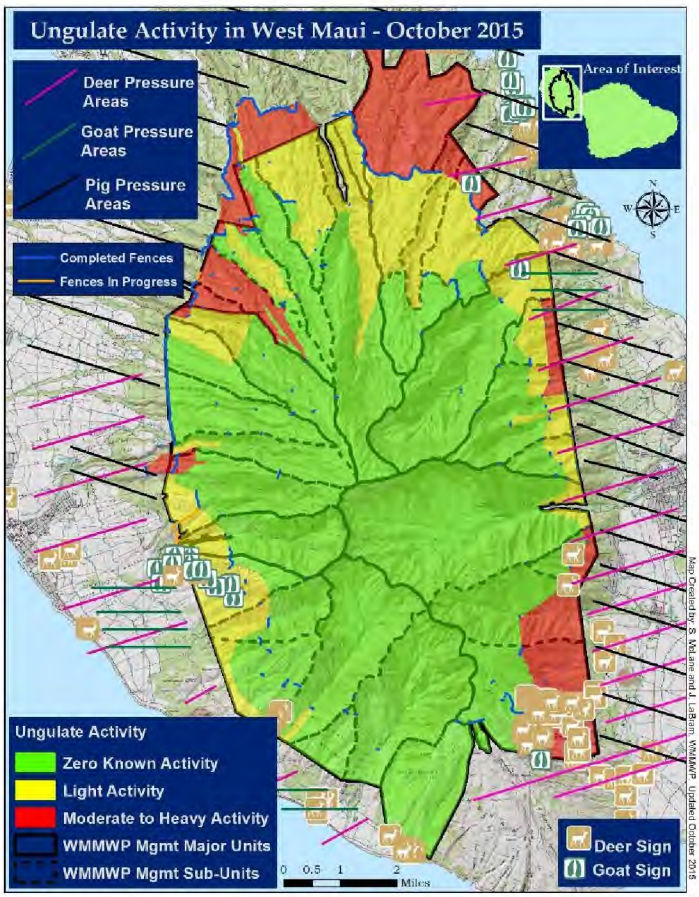


Figure 8. Map showing current levels of ungulate activity in West Maui watersheds. Ungulate activity is at or near zero in the majority of the watershed (green area), but pressure from deer, pigs, and goats is increasing around the entire perimeter of the WMMWP management area.

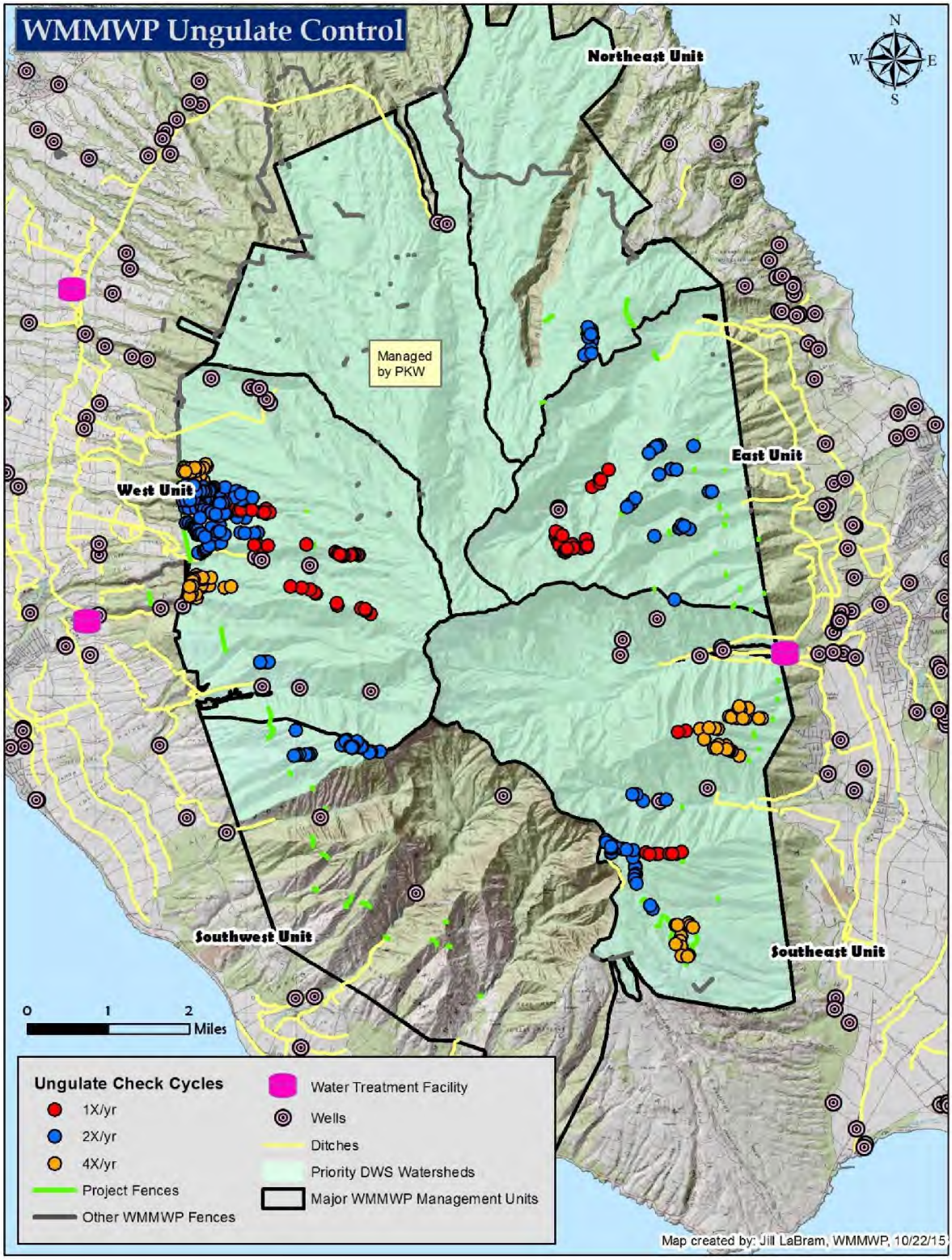


Figure 9. ***Map showing frequency of ungulate check cycles across WMMWP lands. As illustrated by the map, nearly all ungulate control areas lay in or adjacent to priority DWS watersheds.***

Control of Priority Weed Species: Our priority weed targets, objectives, and control methods are identified by our Partner approved Weed Management Plan. Geographically, our "top-down" control approach focuses first on the highest elevation targets of each priority species to protect the pristine core of WMMWP and then work outward. Priority 1 species are the most invasive, habitat-modifying species found above the 2,800-foot elevation line. Priority 2 species are those below this elevation line that are capable of spreading upward into the Priority 1 zone. Although there are several priority species present in West Maui, limited funding and manpower resources hamper our ability to address all targets. Resources will first be directed toward the control of two of the most threatening species—strawberry guava and *Clidemia hirta*—at locations critical to DWS water system protection. Should resources permit, we may expand our weed control program to address other priority threats like *Falcataria moluccana* (Albizia), *Sphaeropteris cooperi* (Australian tree fern), and others.

Photo of monotypic strawberry guava (Psidium cattleianum) understory showing an absence of shrubs, ferns, and mosses that hold water and soil in place. Courtesy of Forest and Kim Starr.

Psidium cattleianum: Water hogging strawberry guava is a priority species because it is known to consume 53% more water in drought periods and 25% more in wet periods than native forests according to research by Dr. Tom Giambelluca, UH Manoa. With data compiled from ground and aerial surveys, we have mapped much of the species range across Mauna Kahalawai (see the red areas in Figure 10, page 21). With this species colonizing thousands of acres of West Maui watersheds, there are serious implications for diminished fresh water recharge. Because of its extensive range across variegated terrain, assessment and control of this species demands a combination of techniques including Herbicide Ballistics Technology (HBT) (use of herbicide impregnated capsules delivered to weed targets via paint ball applicator), biological control dispersal (*Tectococcus ovatus*), staff ground control operations, and volunteer assistance. Helicopter aerial surveys are also needed to survey for suspected incipient populations and specifically direct actions.

- *Task 1: Weed Maintenance Areas:*
  - *Follow-up HBT treatments:* Since 2012 WMMWP has been collaborating with Dr. James Leary, UH CTAHR, in the control of priority invasive species through the use of his HBT methods deployed from a helicopter. To date, we have utilized HBT to treat over 1,602 strawberry guava targets across a 1,593-acre footprint in the most treacherous and inaccessible areas of the watershed. In terms of efficiency, searching and treating targets in this manner allows us to simultaneously expand our knowledge of the species range and treat targets as they are encountered.

Photo of HBT treated strawberry guava on a cliff at 4200 feet elevation in Iao Valley.

Now that we are 3 years from the initial treatment and 12 to 18 months from the second treatment, we seek to further the use of HBT to retreat and cover any survivors (See Figure 10, Page 21). This work will enable us to evaluate the success of the HBT methodology and assess watershed-wide applicability.

- *Ground Control:* Staff ground control has managed strawberry guava populations along accessible ridges and maneuverable terrain. Our focus has been centered on locations in the East and West Units that benefit DWS water systems (see yellow areas in Figure 10, Page 21). While we have seen success in controlling existing trees, maintenance of these areas by treating regenerating trees and seedlings from the seed bank is key to ensure successful and sustained removal of the species.
  Note: To maximize our resources, grounds control missions for priority weeds like strawberry guava and *Clidemia* (described further below) are executed as multi-day camping trips with several crew members. This approach minimizes the use of helicopter time while enabling the crew to cover a considerable area in a confined amount of time.

- *Task 2: Biological Control Dispersal:* Based on data collected from ground and aerial surveys, strawberry guava already blankets 3,000 to 5,000 acres in West Maui—close to 10 percent of our management area. With an infestation this extensive, our DWS and Partner approved Weed Management Plan recognizes that the release of a biological control agent is crucial to effectively slow the spread of this species across the entire landscape and facilitate the success of our HBT and ground control efforts.

Photo of juvenile strawberry guava that is infested with Tectococcus galls at one of our release sites.

The agent *Tectococcus ovatus* is a natural enemy of strawberry guava which has been established on Hawaii Island to help control the spread of the species. Dr. Tracy Johnson, Entomologist with the U.S. Forest Service, partnered with the State Division of Forestry & Wildlife to bring the agent to Maui in 2014 and released to two locations in West Maui. WMMWP is proposing to facilitate dispersal of this exciting new control agent in FY17 to four additional sites within WMMWP lands in partnership with the State. Work conducted in FY15 and FY16 has prepared and will prepare us for these future expanded releases on private lands with owners' permission. It is anticipated that this agent will limit the spread of the species and give management a critical advantage in removing populations which threaten the watershed. Monitoring of the spread of the agent will be supported by state funds.

Photos above: ***Diverse groups of volunteers participate in service trips on the Waihe'e Ridge trail to control strawberry guava with hand saws and herbicide. Source: WMMWP***

- *Task 3: Furthering Volunteer Weed Control:* Volunteer efforts are achieving success on Waihe'e Ridge where effective control will inhibit the spread of strawberry guava into adjacent DWS lands. Control on Waihe'e Ridge improves the only native forest public access trail in West Maui, maintains a functional watershed, and preserves the interpretive value of native forest resources along the trail. With many treated stands dying off, we are expanding the treatment area where possible and retreating areas previously visited (Figure 11, Page 22). To ensure continued success, we request support to conduct another 6 service days to control *P. cattleianum* and other invasive weeds on Waihe'e Ridge. Where possible, we may progress to the next phase of work: out-planting native plants to help heal impacted areas, increase native species diversity, and restore watershed function. In time, we seek to replicate this volunteer control program in Kapunakea Preserve or similar areas of high interpretive and watershed value.
  Note: Beyond weed control success, these volunteer stewardship trips have also contributed to our public education goals by directly engaging residents in watershed protection and imparting the values of our native watersheds.

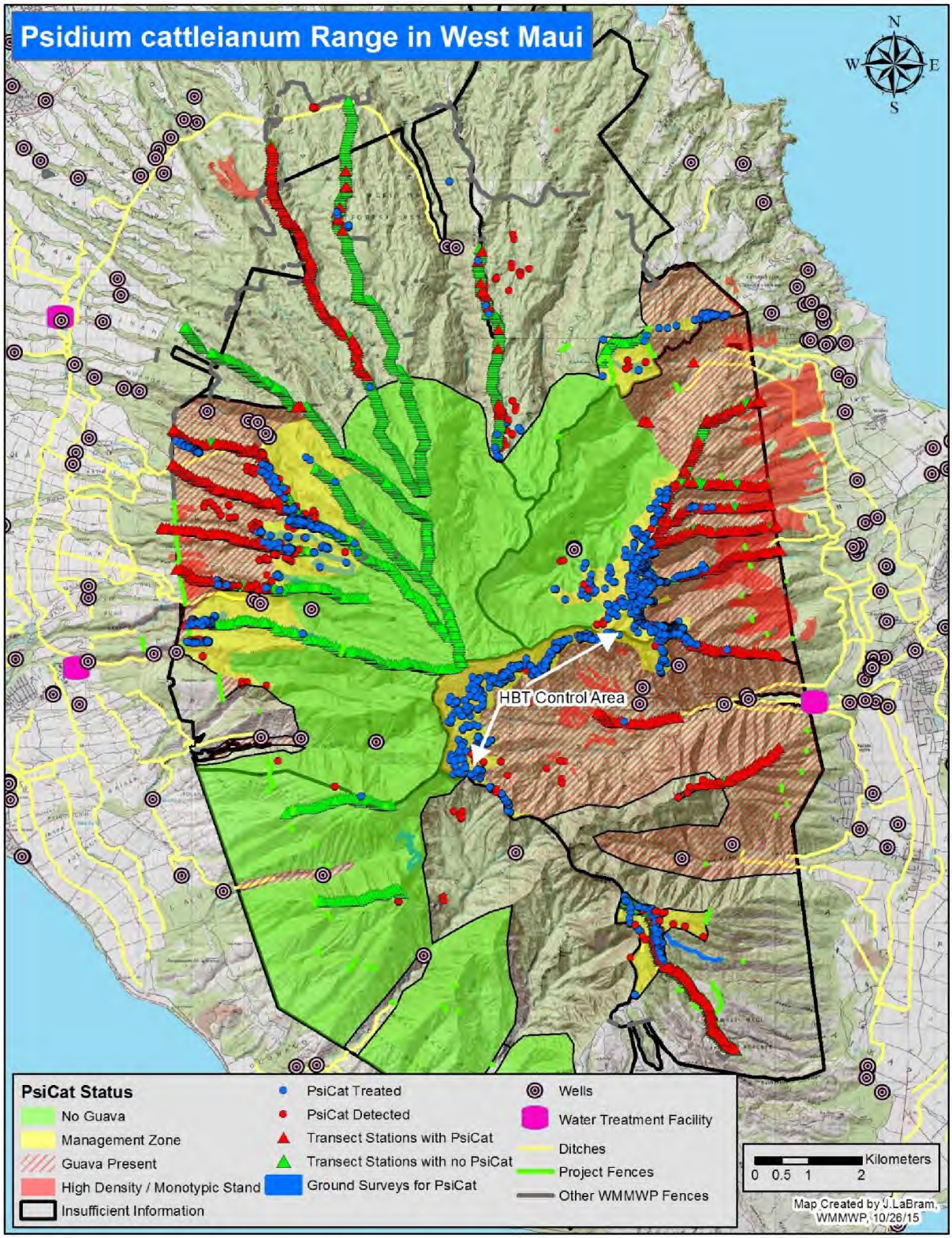


Figure 10: Map depicting the known range of Psidium cattleianum (red areas), informed by ground and aerial surveys by WMMWP. The blue dots represent treated plants. Our targeted management zones (yellow polygons) are essentially the transitional interfaces between infested areas (red) and areas free of the species (green). The HBT control area (labeled in white) stretches from Iao to Waiehu, covering some of the steepest and otherwise inaccessible terrain.

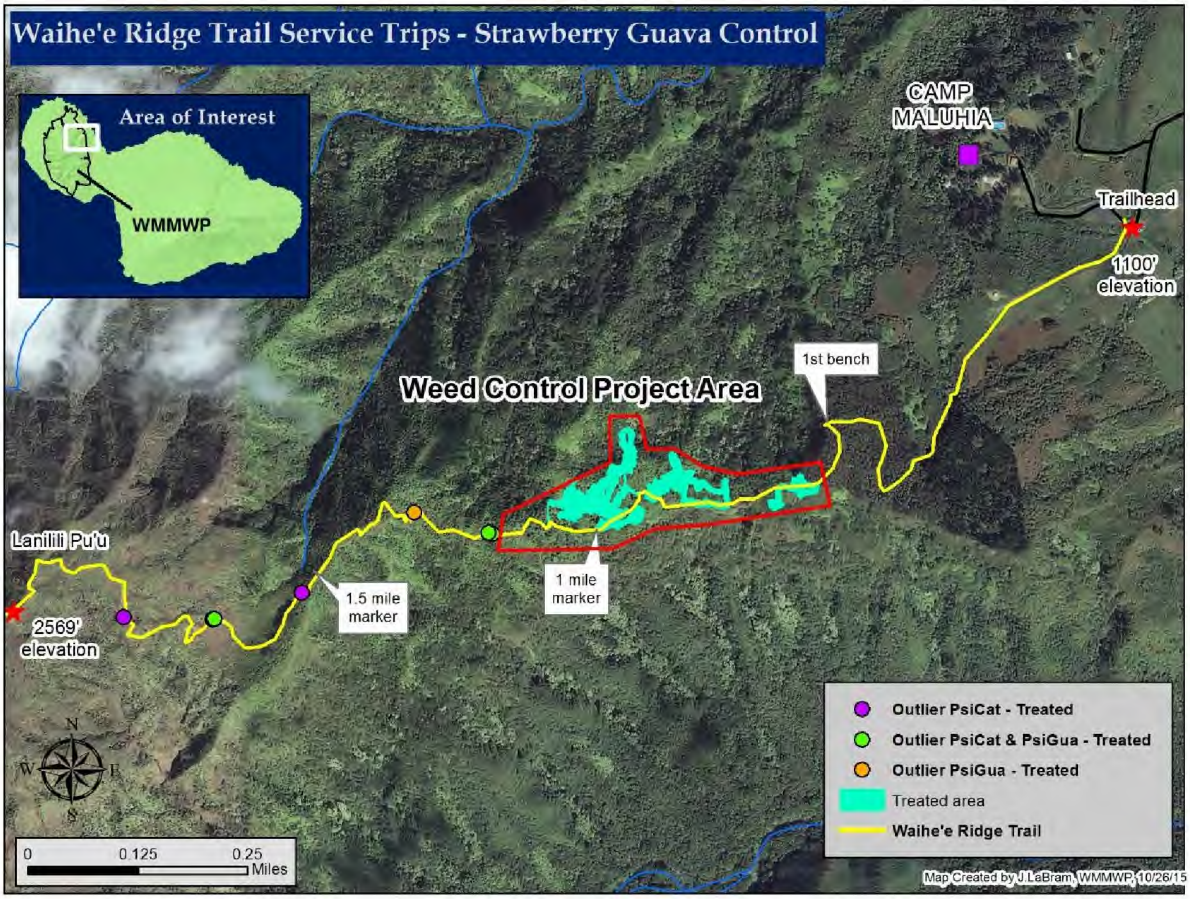


Figure 11: ***Locations of WMMWP volunteer stewardship trips on Waihe'e Ridge Trail. This effort achieves meaningful education and management goals. The first volunteer weed control trip occurred in November 2012 and served to control just under 100 outlying strawberry guava trees. Recent efforts targeting higher density areas are able to remove/treat up to 500 trees per event. Six volunteer weed control stewardship trips are proposed to remove strawberry guava from this otherwise high quality section of forest and potentially out-plant native species.***

Clidemia hirta: Commonly known as "Koster's curse," this species is capable of displacing and shading out the native shrub canopy and understory cover by growing into expansive thickets up to 10 feet tall. The denuded understory is often bare and devoid of moss, ferns, and other herbaceous cover that help to trap and absorb water. The diminished forest structure reduces absorption of precipitation and increases the rate of erosion. Our goal is to remove satellite populations of *Clidemia* in the West and Southeast Units as depicted in Figure 12 (Page 24) and keep the northern populations from advancing south. Individuals will be eliminated wherever found in these areas using ground control efforts which include pulling young plants and herbicide applications to larger, established individuals.

Photo of Clidemia hirta. Courtesy: Forest and Kim Starr.

- *Task 1: Lahaina Clidemia Control:* In the West Unit, successful control of the population has evolved from treating mature, seed-bearing plants to addressing mostly small, immature sprouts. Individuals historically have been found in the Lahaina area. With a lingering seed bank and new seeds spread by birds, continued control of this population is important to prevent establishment closer to the Lahaina System watershed.

- *Task 2: Iao Valley Clidemia Control:* Populations have been identified recently in the Southeast Unit within Iao Valley. These areas need to be controlled continually until the seed bank ceases to yield new plants—we seek to replicate the method we successfully implemented in the Lahaina control area. Control of these populations will be critical to preventing widespread establishment across the Iao aquifer.

Other Weed Species: Although we have made headway in controlling top priority species, there are always new threats to address. The opportunistic control of priority species encountered during the course of other field activities is common. For example, *Macaranga tanarius*, *Melochia umbellata, Falcataria moluccana* (Albizia), *Sphaeropteris cooperi* (Australian tree fern), *Angiopteris evecta* (mule's foot fern) and *Casuarina equisetifolia* (Ironwood), are priority targets that may be treated opportunistically on the ground or by aerial methods such as HBT or surgical use of herbicide. If warranted, MISC will be informed of Pampas Grass (*Cortaderia jubata)* locations that may be encountered. Additionally, incipient weed introduction by crew will be prevented by continuing strict decontamination procedures of gear, clothing, and vehicles.

Weed Management Specialist: As discussed, our fencing and ungulate control programs have progressed to the point that we are driven to intensify our weed control program. A dedicated specialist will be absolutely critical to effectively orchestrate, manage, and spearhead this effort. The invasive species we encounter are fast growing species that spread easily by bird and wind and that are well suited to grow in the ecological niches of West Maui. Monitoring species ranges, population dynamics, and treatment locations will involve highly organized data collection systems, while analysis of treatment effectiveness and strategizing future control will take focused expertise. For these reasons, we are planning on integrating this new capacity.

Quantifiable Measures of Effectiveness: Subsequent years will report the same metrics and show elimination in the following year or a trend in reduction.

- Measure 1: Maps and GIS data will be provided for treatment locations, data on plants controlled, the number of acres surveyed and methods used to control each species
- Measure 2: % of area covered within the search area and number of acres per method
- Measure 3: # of threats detected and the density per acre found
- Measure 4: Rate of spread of *T. ovatus* to surrounding vegetation
- Measure 5: Hiring of Weed Management Specialist

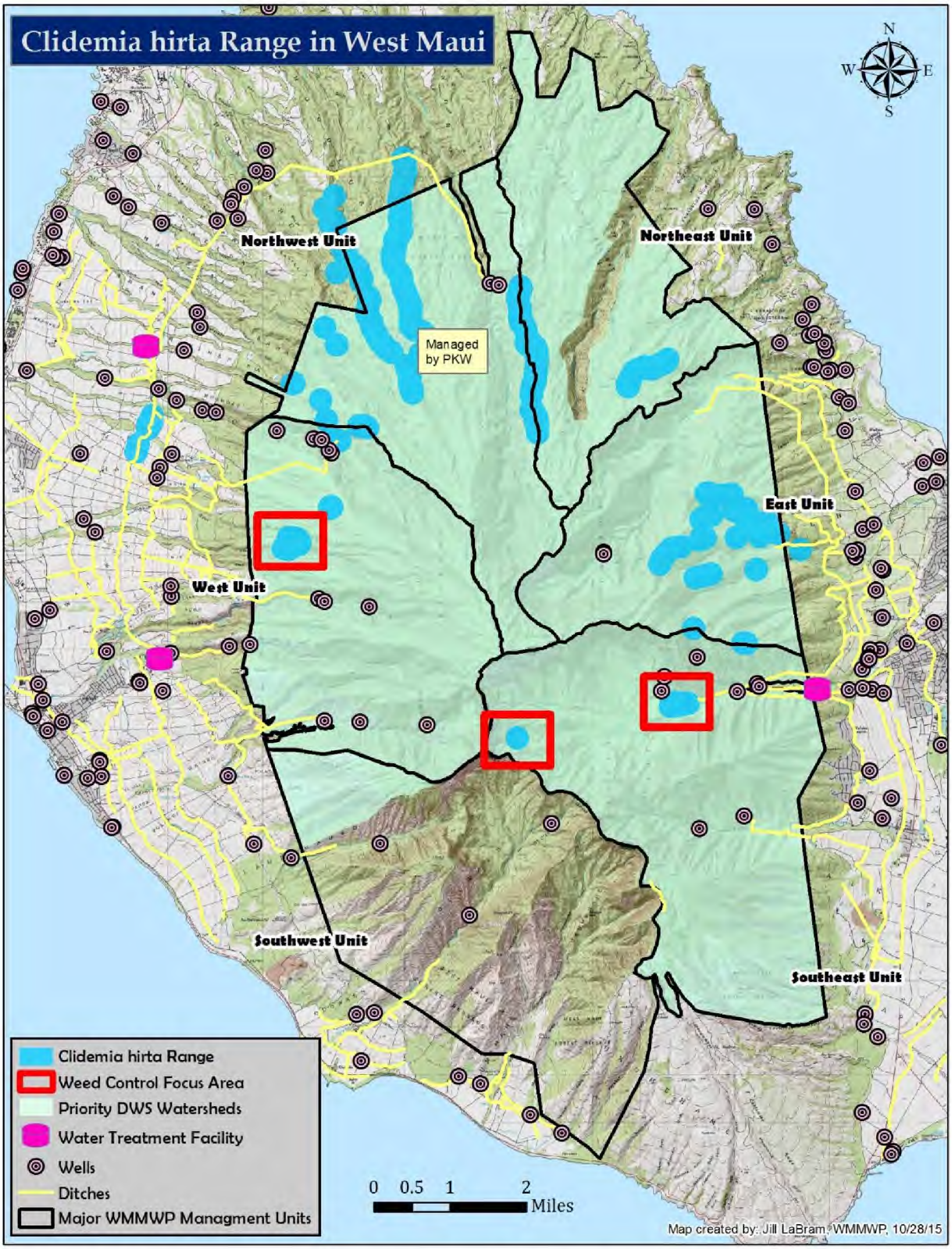


Figure 12: Map depicting the range of Clidemia hirta surveyed by WMMWP (light blue areas). The red boxes identify the satellite populations in the West and Southeast Units that are weed control focus areas for this scope of work. Also shown are the Priority DWS watersheds in light green.

Watershed Monitoring Program: The WMMWP watershed monitoring program informs best management practices, provides quantifiable measures of threats, sets management priorities, and enables early detection of forest threats. With several thousand acres added to our active management area in the past year, additional funding and resources are needed to implement our monitoring procedures in these newly explored areas while still maintaining our presence in existing management areas. Monitoring activities include forest transects for ungulate sign and weed presence, water quality monitoring, photo/vegetation plots, aerial surveys for threats, and ground scouting for threats. Analysis of monitoring data quantifiably answers many of the broad questions about effectiveness of our management programs including long-term trends of watershed decline or management success. Under this proposal, monitoring will focus on DWS priority areas, while state funds will be leveraged to further support this program in these and other areas.

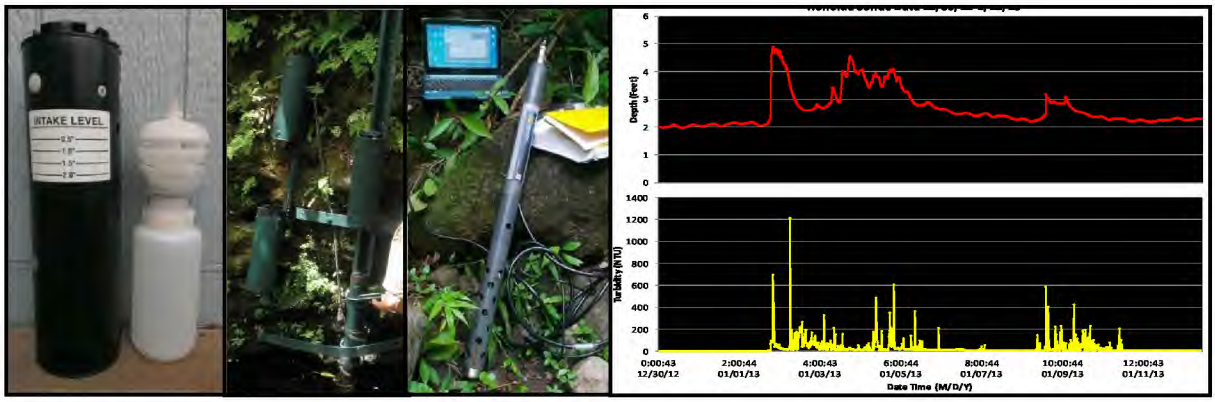
Photos Above: Tracking the pulse of watershed resources is achieved through a combination of ground and aerial methods. Photos: WMMWP

Task 1: Ungulate Monitoring Transects: There are currently 30 WMMWP transect segments of various lengths, running mauka to makai with stations every 50 meters along a 5m-wide belt. Twenty-seven segments are within the DWS source priority watersheds and need to be read annually (Figure 13, Page 28). Ungulate transects are measured annually for % new sign (disturbance within two weeks) and % old sign (disturbance older than two weeks) such that 1% disturbance entails a disturbed area of 1.6m x 1.6m in each 5m x 50m station. Sign/disturbance can consist of browsed vegetation, grubbed bare earth, tracks, etc. These measurements enable us to document the location and relative intensity of ungulate presence and absence on the mountain (one of the products of this monitoring activity is exhibited in Figure 8 (Page 16), a map showing degrees of ungulate activity in and around the mountain). Fluctuations in these percentages over time and across the landscape inform us of whether the land is healing in the absence of ungulates, continuing to degrade with ongoing activity, or affected by new ungulate ingress. Synthesis of this information helps us assess effectiveness of the ungulate control program and modify control efforts as necessary.

Note: As mentioned above, ungulate transect missions are often combined with ungulate control missions (wherever practicable) to efficiently utilize helicopter time and staff resources.

Task 2: Invasive Weed Monitoring Transects: The presence of invasive weeds within each 5m x 50m transect station will be read to understand the dispersal rate and range of species. Transects on one-third of WMMWP units will be read annually for presence of weed species to complete a 3-year rotation across all transects. The understanding of weed dynamics gained from these transects is key to developing strategies for controlling both incipient pests and established populations. With new weed introductions becoming more frequent, reading transects and synthesizing and mapping the data become increasingly more complex with time. As mentioned under the scope for our Weed Control Program, the addition of a Weed Management Specialist on our team would both facilitate and advance these program goals.

Task 3: Water Quality Monitoring in Honolua: Water quality monitoring must be sustained in Honolua Valley to gather empirical data to correlate improvements in water quality with management success. This effort records the decline in ungulate impacts after the completion of a 1.8-mile boundary fence in 2013 and subsequent animal removal above the completed fence. With baseline records complete, we have progressed into the next stage of data collection and analysis. Actions include monthly checks of an YSI turbidity and water level monitoring sonde, erosion bridge sampling, pig activity surveys, water nutrient samples, etc. Reports will provide maps, data metrics, and assessment of change per monitoring technique, set in comparison to the baseline data. This area is being managed by Pu'u Kukui Watershed and WMMWP staff are maintaining this monitoring station. We hope to replicate these methods in other watersheds over time to ultimately assess natural water quality across Mauna Kahalawai.



Photos, left to right: Water sampling bottle; sampling set-up in Honolua Stream; data collection from the sonde via laptop, and sample analysis. Photos: WMMWP.

Task 4: Forest Health Observations & Monitoring: Incidental observations of forest health issues are important and will be reported to State officials as detected to aid in the understanding of forest threats. Examples include impacts from *Erythrina* Gall Wasp, a wasp which nearly decimated native Wiliwili trees several years ago, and *Ceratocystis* Wilt of Ohia, also known as Rapid Ohia Death, which is a disease that is decimating dominant ohia trees across thousands of acres on Hawaii Island. Naio Thrips is another major disease concern on Hawaii Island and needs to be monitored on Maui to contain potential spread on the island. Rare species, when detected, will be reported to the Plant Extinction Prevention Program (PEPP).

Task 5: Photo/Vegetation Plot Monitoring: Four-meter circular plots will be monitored for changes in vegetation and recovery from ungulate activity, fire, dirt bikes, and other disturbances. Plots within one-third of the watershed will be read each year to establish a 3-year rotation. Comparison of growth from period to period provides insight into how the forest and various species respond to different stressors. The data gleaned is utilized to teach lessons and direct management toward weed species which the native forest is not able to combat on its own.

Photos above: Comparison of photo points depict vegetation growth and species changes over time at specific locations throughout the watershed. Data on species growth informs strategies for weed control, ungulate control, and related management actions. Photos: WMMWP.

Task 6: Aerial Surveys: Aerial surveys will cover unfrequented lands in search of watershed threats in the interest of early detection, future planning, and response to incipient threats. Importantly, it is only through aerial surveys that we are able to gain knowledge about watershed lands that are otherwise inaccessible during the course of other management programs.

Quantifiable Measures of Effectiveness:

- Measure 1: Reports will compare transect % levels to prior years
- Measure 2: GIS data on presence of ungulate sign, weeds, and rare species along transects and threat locations from aerial surveys.
- Measure 3: Photo/vegetation plots will assess changes in disturbance and recovery.
- Measure 4: Levels of water quality will be reported and any changes will be assessed.

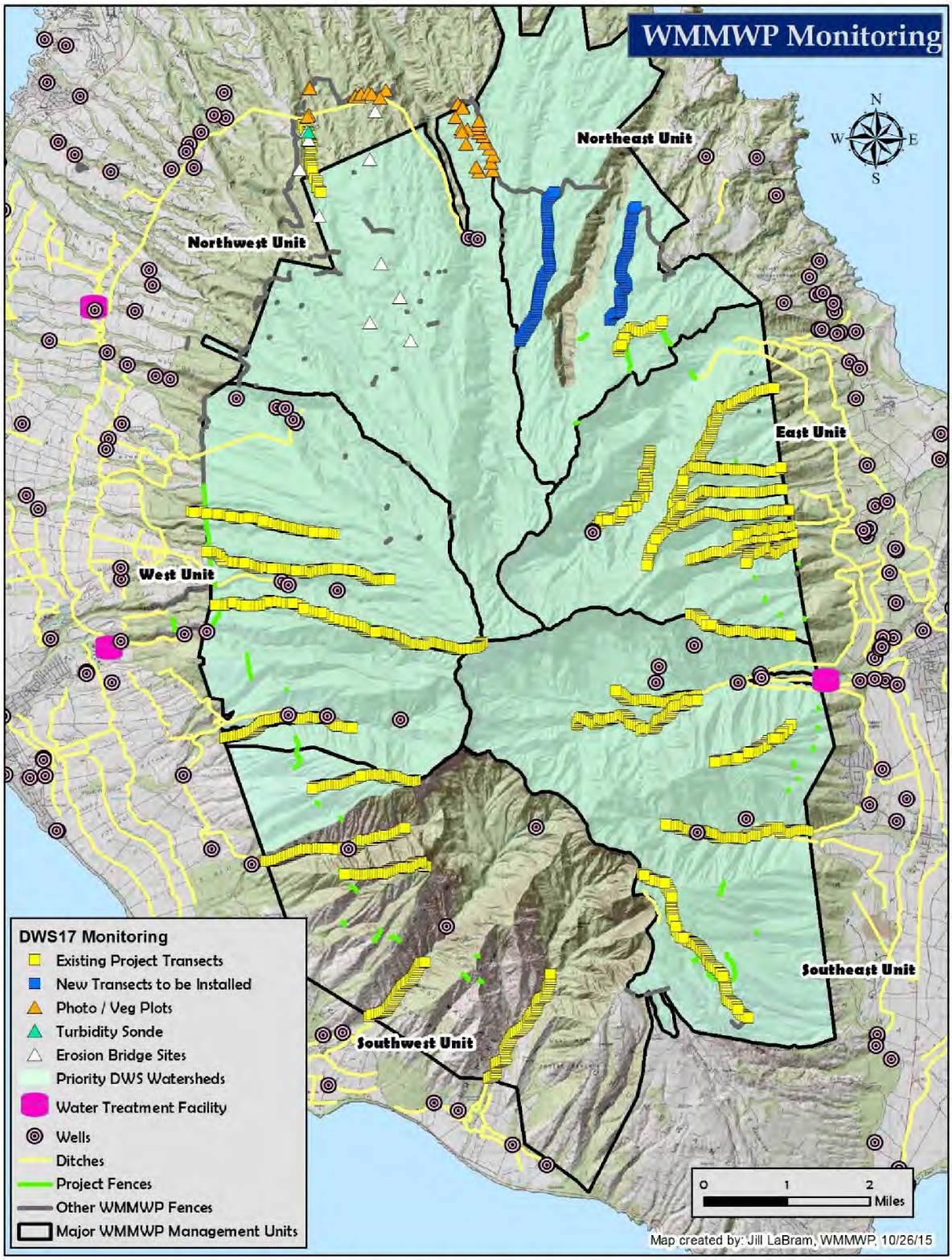


Figure 13. Map illustrating the extent of our watershed monitoring program. Transects are read annually for ungulate sign. Presence of invasive plants is recorded on one third of of the watershed each year to cover each transect every third year. Information is recorded in 50-meter intervals along five-meter-wide swaths. Transects are established for a baseline inventory when initiating management in an area. Photo/vegetation plots are shown by orange triangles. Ground surveys are not depicted but are an important aspect, especially in newly monitored areas. Aerial helicopter surveys (not shown) are needed to comb hard to reach places or cover broad areas coarsely for early detection of forest threats.

Photos Above and Left: WMMWP crew lead stewardship hikes to the Waihe'e Ridge Trail (left photo) for people of all ages and backgrounds, as well staff outreach booths at community events (middle, HILT annual picnic). Photos: WMMWP.

Public Education and Awareness Program: The goal of this program is to continuously build understanding and support for watershed management within the local community. The Partnership believes that the public should be aware of and engaged in the management of the West Maui Watershed as the source of 76 percent of our public drinking water supply. By educating the public on the importance of native forests and the values of the watershed, WMMWP seeks to ignite a sense of individual and community responsibility to protect these areas. Preservation of native forests and watersheds equates to sustainability in land use and natural resources, especially our water supply. By illuminating traditional and modern knowledge of the land's unique treasures and challenges WMMWP can instill a greater sense of appreciation for Mauna Kahalawai to inspire and empower people to make a difference.

Photo above: Screen shot of our WMMWP Facebook page cover photo showing native species and landscapes, linking watershed management with our water supply.

Task 1: Maintain Use of Media and Social Media: WMMWP proposes to maintain and update valuable communication tools such as our website (westmauiwatershed.org), brochure, quarterly newsletters, outreach booth visuals, our Facebook page, and other social media outlets. Our Facebook page in particular facilitates nearly continuous and direct interactions with large numbers of people. Notably, messages spread by our social media outlets have attracted volunteers to join our Waihe'e Ridge stewardship trips, thereby strengthening our weed control program.

Task 2: WaterStory Educational Sessions: WaterStory is an interactive and participatory session that was developed by the Maui Economic Development Board (MEDB). With the common goal of educating the community about water resources on Maui, WMMWP joined MEDB to integrate watershed resources into the session content and present WaterStory to groups of residents around the island. WaterStory educates Maui residents about: the history of water in Maui; current issues; factors affecting supply and demand; and planning efforts to address the future. The session runs for two hours and includes both individual and team (role playing) exercises that engage participants in planning for the future and taking an active role in managing our island's water resources. The goal is that participants will leave with a greater perspective on water issues in Maui County, the relationship between healthy forests and clean water, and ways each person can get involved in protecting water resources. We propose eight sessions with various community groups.

Photo Above: Students participate in Waterstory and are challenged to figure out solutions to real watershed and water resource and supply issues facing Maui County.

Task 3: Outreach Events: WMMWP will participate in 5 community outreach events such as the Maui County Ag Festival, Arbor Day, Whale Day, and neighborhood and community association meetings. We aim to directly reach approximately 400 people during these events, and indirectly reach 900 due to our presence alone. Similar to our media and social media outreach connections, interactions at these events have inspired people to sign up for volunteer stewardship trips to Waihe'e Ridge, thus contributing to our weed control goals.

Quantifiable Measures of Effectiveness:

- Measure 1: Reports will furnish numbers of people reached through Google analytics, Facebook, and tallies of persons interacted with during outreach actions.
- Measure 2: Photos and summaries of messages shared and an appraisal of interactions will be provided.

E. TIMELINE

All proposed activities found in this section are ongoing. The goal will be to complete all deliverables in 12 months from the date of execution. Fence and ungulate control inspection schedules are depicted in the preceding map products. Section narratives further define the frequency of activities.

Description of each deliverable	Expected amount of time to complete deliverable (# Months/# Weeks)	Time frame (include expected months)
Maintenance and Inspection of Fences	4 weeks - full staff	Quarters 1-4 (past the NTP*)
Ungulate Control Program	5 weeks - full staff	Quarters 1-4 (past the NTP*)
Control of Priority Weed Species	5 weeks - full staff	Quarters 1-4 (past the NTP*)
Watershed Monitoring Program	4 weeks - full staff	Quarters 1-4 (past the NTP*)
Public Education and Awareness Program	4 weeks – full staff	Quarters 1-4 (past the NTP*) Two presentations /quarter

*NTP = Notice to Proceed

F. PROJECT DELIVERABLES

Goal 1: Maintenance and Inspection of Fences		
Task	**Deliverable**	**Measure of Success**
Fence Inspection	• Inspect 7.6 miles of fence (ranging from annual to quarterly checks)	Conducted the appropriate number of checks and total length of fence inspected
Fence Maintenance	• Repair and maintain fences as needed	All necessary repairs completed
Goal 2: Ungulate Control Program		
Task	Deliverable	Measure of Success
Feral Ungulate Management	• Check all project ungulate traps (ranging from annual to quarterly checks) • Update check and capture maps • Ground scout in ungulate free areas for early detection • Ground scout – rapid response in new hotspot areas	All checks are completed. New groups added as needed. GIS maps depicting checks, captures, new groups added Total miles scouted and mapped

Goal 3: Control of Priority Weed Species		
Task	**Deliverable**	**Measure of Success**
Weed Maintenance Areas – *Psidium cattleianum*	• Follow-up treatment and assessment of HBT treated Strawberry guava • Ground Control Efforts: Maintain prior weed control treatment areas throughout the watershed by controlling regenerating trees or seedlings from the seed bank	Assess previously treated targets Total number of acres swept Number of individuals controlled GIS maps depicting control work
Biological Control Dispersal – *P. cattleianum*	• Facilitate dispersal of the strawberry guava biocontrol, *Tectococcus ovatus* to four more sites on state land within WMMWP	Document areas of dispersal Facilitate dispersal Photographs and GIS maps depicting work
Furthering Volunteer Weed Control – *P. cattleianum*	• Conduct 6 volunteer service days to control *P. cattleianum* and other weeds on Waihe'e ridge trail, Kapunakea Preserve or similar areas of high interpretive and watershed value. • Out-plant native species in previously treated areas.	Total volunteer hours completed Total number of plants controlled and acres swept GIS maps and photos depicting control work. Total number of native plants out-planted.
Lahaina *Clidemia hirta* control	• Continue to monitor and control *Clidemia* population on Wahikuli ridge	Total number of plants controlled and acres swept GIS maps depicting control work Detecting no mature individuals
Iao Valley *C. hirta* control	• Control identified locations of *Clidemia* in Iao Valley. • Sweep buffered area around known locations.	Total number of plants controlled and acres swept. GIS maps depicting control work
Other Weed Species	• Control other priority species encountered during the course of other work • Prevent incipient weed establishment by continuing strict decontamination procedures • Support MISC by informing them of any new priority weed locations	Total # of plants controlled GIS maps depicting control work Detecting no incipient weeds during regular work Send MISC location info of priority weed species

Goal 4: Watershed Monitoring Program		
Task	**Deliverable**	**Measure of Success**
Ungulate Monitoring Transects	• Annually monitor up to 27 ungulate transect segments	Recorded percent of ungulate sign on transects
Invasive Weed Monitoring Transects	• Annually monitor one-third of watershed for presence of invasive weeds on transects	Recorded weed presence along transect stations
Water Quality	• Monthly checks of a YSI turbidity	Collect and provide data

Monitoring in Honolua	sonde and rain gauge • Monitor 10 erosion bridges annually • Collect water samples as needed	metrics Assessed any changes annually per monitoring technique
Forest Health Observations and Monitoring	• Report incidental observations of forest health to aid in the understanding of forest threats • Report rare species to the Plant Extinction Prevention Program (PEPP)	Reported any observations and locations found
Photo/Vegetation Plot Monitoring	• Annually monitor one third of watershed with photo/vegetation plots to compare vegetation growth and composition from year to year	Read the appropriate photo/vegetation plots Assessed annual changes in disturbance and recovery
Aerial Surveys	• Conduct aerial surveys to cover unfrequented lands in search of watershed threats	GIS maps depicting area covered and any threats found

Goal 5: Public Education and Awareness Program		
Task	**Deliverable**	**Measure of Success**
Maintain Use of Media and Social Media	• Maintain website, brochure, newsletter, and update outreach booth visuals • Maintain Facebook page and other social media methods	Report on number of people reached through Google analytics and Facebook
Furthering Volunteer Weed Control	• See Priority Weed Control Section (Task 3)	
WaterStory Educational Sessions	• Conduct 8 WaterStory sessions	Audience evaluations and # of participants
Outreach Events	• Participate in 5 community outreach events	# of people reached directly and indirectly

G. BUDGET SUMMARY

County of Maui
Department of Water Supply

Watershed Protection Grants

Project Budget Summary

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Expense Categories	Amount Requested
A. Personnel (Payroll Taxes and Fringe)	$246,768
B. Transportation- See other Categories	$0
C. Contractual (e.g., helicopter)	$25,000
D. Utilities (e.g. telephone/cell, water, electricity, etc.)	$5,614
E. Travel	$6,700
F. Field Crew Costs	$8,500
G. Supplies and Materials	$15,700
H. Administrative & Overhead Costs	$31,818
I. Other Costs	$9,900
Total:	$350,000

County of Maui
Department of Water Supply
Watershed Protection Grants

A. PAYROLL COSTS

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

List by position & % of 40-hour week	Salary	
Position name / Title		
Program Manager 38%	$	31,090
Field Crew Supervisor 38%	$	20,810
Field Crew Leader 38%	$	17,700
Natural Resource GIS Tech 38%	$	22,996
Program & Data Asst 38%	$	20,027
Invasive Weed Specialist 38%	$	20,027
Field Assistant 38%	$	14,737
Field Assistant 38%	$	12,128
Field Assistant 38%	$	12,128
Field Assistant 38%	$	11,550
PCSU Specialist	$	11,838
Sub total	$	195,031

County of Maui
Department of Water Supply
Watershed Protection Grants

A. PAYROLL COSTS (cont.)

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Payroll Taxes, Fringes:		
Program Manager	$	8,193
Field Crew Supervisor	$	5,252
Field Crew Leader	$	4,194
Natural Resource GIS Tech	$	6,858
Program & Data Asst	$	3,722
Invasive Weed Specialist	$	4,578
Field Assistant	$	5,470
Field Assistant	$	5,271
Field Assistant	$	2,516
Field Assistant	$	2,369
PCSU Specialist	$	3,314
Sub total	$	51,737
Total:	$	246,768

Explanation of Personnel Costs: The proposed costs in this category are designed to accomplish project deliverables in the scope of work. Remaining staff salaries and benefits will be fulfilled through soft grant funds awarded through similar proposal processes with the State of Hawaii, federal government and private organizations. The fringe benefit rate includes medical, retirement, group life insurance, long term disability, long term care, worker's compensation, FICA and other benefits consistent with the policies set by the Research Corporation of the University of Hawaii through which WMMWP staff are hired. The benefits rate varies slightly and is based on individual's family structure.

West Maui Mountains Watershed Partnership
JOB DESCRIPTIONS

PROGRAM MANAGER - Manages WMMWP program under the broad direction of WMMWP partners. Develops, maintains, and updates all program plans, prioritizes action plans and ensures plans are carried out by subordinates. Incorporates a safety culture in program management. Identifies opportunities for program funds and develops proposals and grants. Makes presentations, manages program budget, produces progress and final reports. Collaborates with other organizations, directs WMMWP public education program. Supervises staff and provides overall leadership by establishing priorities and setting program direction. *Credentials: B.S. Natural Resource Mgmt. – 14 yrs. professional experience in Conservation in Hawaii.*

PROGRAM & DATA ASSISTANT – Responsible for general program support duties required to efficiently administer a natural resources research and protection project. Manages and organizes all support activities for the project including travel, timekeeping, purchasing, and other RCUH and University documents. Manages and tracks budget/expenditures for project grants and prepares financial summaries. Assists in the development of proposals and management of proposed project budgets. Manages, maintains and organizes accurate records and files on all project activities and assists with the preparation of reports on accomplishments and activities. Manages project data and provides data analysis support for field-work. *Credentials: B. Soc. Sci. Honors - Eight years professional experience with five years planning and three years watershed programs.*

NATURAL RESOURCE & GIS TECHNICIAN – Provides management and GIS support for WMMWP and field staff relating to all aspects of a natural resources research and protection projects. Provides GIS technical services for the project to facilitate fieldwork, support mission planning, and evaluate progress by generating map products. Designs, manages, and maintains tabular and spatial data management systems. Records and inputs field and Global Positioning System (GPS) data. Designs and prepares data summaries. Participates in all aspects of the WMMWP field operations and assures quality control through monitoring of treatment effectiveness. *Credentials: M.S. Biology- 12 years professional experience with 10 years using GIS to manage natural resources, 13 years of field experience*

FIELD CREW SUPERVISOR- Conducts field operations. Implements projects related to controlling alien species and protecting and restoring native habitats and biodiversity. Train field leaders, workers and temporary hires in field procedures, equipment use and care, fence construction and maintenance, herbicide application, animal control and helicopter operations. Supervise field crew. Builds fences and controls invasive alien plant and animal species. Manage/coordinate the field operation. Prevent seed dispersal. Record detailed field data, & summarize & coordinate data analysis using. *Credentials: B.S. Natural Resource Mgmt. – 10 yrs. professional experience with eight years of backcountry field experience*

WEED MANAGEMENT SPECIALIST- Serves as a primary program lead in invasive weed management. Assesses weed targets for control and leads management efforts of designated priority weed species using mechanical and chemical means. Secondary duties include monitoring the native ecosystem and controlling feral animal populations, building and maintaining fence lines. Assists in mapping and data projects and assists with report preparation. Assigned as a primary technician in HBT operations. *Credentials: Presently Vacant. Requires a B.S. Biology or similar, three years of professional experience in invasive species management and watershed protection work.*

FIELD CREW LEADER- Serves as field crew leader, leading personnel involved in monitoring the native ecosystem & controlling feral animal populations, building & maintaining fence lines, controlling alien plant invasions using mechanical chemical means, restoring native vegetation. Ensures that field operations follow and adhere to appropriate safety and operational policies/guidelines. Records detailed field data & spatial information & inputs data into Global Positioning System & computer systems. *Credentials: – Two Years of Liberal Arts College, Five years professional experience.*

FIELD & DATA TECHNICIAN – Serves as a member of the field crew involved in monitoring the native ecosystem and controlling feral animal populations, building and maintaining fence lines, and controlling alien plant invasions using mechanical and chemical means. Takes lead role in mapping and data projects and assists with report preparation. Assigned as primary technician in HBT operations. *Position is currently vacant. Required credentials include: Bachelor's degree plus one to three years natural resource management fieldwork and GIS.*

FIELD ASSISTANT(S) (Five to Seven Positions) – Serves as a Field Assistant involved in monitoring the native ecosystem and controlling feral animal populations, building and maintaining fence lines, and controlling alien plant invasions using mechanical and chemical means. Other duties include mapping invasive species locations, current and proposed fence lines, recording control work. Assigned to invasive weed task management and/or ungulate control tasks. *Credentials: Various levels of education ranging from M.S. through High School with trade, hunting, botanical, technical and outdoor skills experience. Trained in rappelling, helicopter transport and external load certifications, wilderness first responder to 1st aid trained, species identification, wilderness fence construction, water and forest health monitoring, aerial and ground surveys, data recording, data entry, GIS and cartography, basic computing, outreach and education, etc.*

Note: WMMWP is in the process of updating its job descriptions and reorganizing some positions to better serve our mission. The position descriptions above may be modified or re-described during this project period.

County of Maui
Department of Water Supply
Watershed Protection Grants

B. TRANSPORTATION COSTS

(by type and nature)

Fiscal Year: **2017**

Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Transportation cost are budgeted in the following categories:	$0
Fuel (Trucks and equipment) See section G. or Supplies, Materials and Equipment.	$0
Repairs/Vehicle maintenance See section I. or Other.	$0
Total:	$0

Narrative Justification

- Three project vehicles are used to transport the crews and materials from our base of the forest reserve for projects over rugged 4x4 roads throughout the Lahaina and Wailuku Districts. Wear and tear on vehicles for this purpose would include repairs, tire replacement, registration, safety checks, etc.

County of Maui
Department of Water Supply
Watershed Protection Grants

C. CONTRACTUAL SERVICES

(e.g. helicopter, etc.)

Fiscal Year: **2017**

Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Helicopter for Control, Fence maintenance and weed control	$20,000
Helicopter Charter for weed control/HBT/sprayball treatment	$5,000
Total:	$25,000

Narrative Justification

- Helicopters are required to transport crew and materials into remote field camps and work sites. Thousands of pounds of fence materials, camp gear and tools are air lifted. Work would never be accomplished without this tool. Hiking in to such areas with the necessary equipment without helicopter support would increase costs several times. Use of helicopters in standard practice in resource management work in Hawaii and in similar conditions worldwide.
- Fence Maintenance, Ungulate & Weed Control: 25 hr x 1,000 $/hr = $25,000

County of Maui
Department of Water Supply
Watershed Protection Grants

D. Utilities

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Telephone (land line) plus Internet Access	$1,560
Sewage Pumping Service	$1,594
Electricity for Base yard	$1,700
Water bills	$640
Internet Based Fax	$120
Total:	$5,614

Narrative Justification

- WMMWP is rent free due to in kind contributions of base yard space by West Maui Land Company. Our non- profit owned portable field station requires only electricity to power our office trailers, drinking water, and portable toilet service. Utilities are used to support project implementation by WMMWP staff and not University administrative support.
- Telephone and internet service are provided to us as a business bundle package from our provider. Base cost is $89.98 per month. With taxes and fees, monthly costs are estimated at $110 to $125 per month, over 12 months.
- Fax costs are $8.95 per month for 12 months.
- Electricity costs an average of $275 per month.
- Sewage pumping service is estimated at $175 per month.
- Water service is estimated at $100 to $110 per month.

County of Maui
Department of Water Supply
Watershed Protection Grants

E. Travel

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Crew Fieldwork Per diem	$700
Inter-Island Coordination Meeting Airfare	$1,000
Conference travel, per diem and accommodations	$5,000
Total:	$6,700

Narrative Justification

- Per Diem is required for all overnight camping trips at a rate of 20$ per day per person. We estimate at least one 2-day camping trip per month with up to 6 to 7 staff per trip, over the 12-month grant period.
- Professional development through conference attendance (such as the Hawaii Conservation Conference) exposes them to new ideas, techniques, and methodologies and broadening of our staff experience is vital to long term retention and staff growth. Based on prior years, per person conference travel is estimated to be: $200 airfare + $120 off-island per diem + $20 ground transportation and parking + $260 lodging.
- The Program Manager is requested to attend meetings on Oahu for State functions related to the advancement of watershed protection and the Hawaii Association of Watershed Partnerships. Estimated costs include $200 airfare + $50 off-island per diem for 1 function every quarter.

County of Maui
Department of Water Supply
Watershed Protection Grants

F. Field Crew Costs

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Crew Field Supplies	$1,500
Crew Training	$4,000
Conference Registration	$3,000
Total:	$8,500

Narrative Justification

- Field Crew Supplies includes items such as flagging tape, saw blades, rope, rappelling gear, work gloves, tools, camp gear (tents, sleeping bags, rain protection, etc), hand held gps units (~$450 per unit), radios (~$500 per unit), power tools, packs, boots (~$250 per pair), T- shirt uniforms, etc.
- Field crew training includes technical training and cross training in field based observations, computer software, wilderness first aid, CPR, rappelling, helicopter safety, database use. Includes fees and travel. Fees range from $100 to $300 per person.

H. ADMINISTRATIVE & OVERHEAD COSTS

(by type & nature)

Fiscal Year: **2017**

Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
UH 10% indirect charge	$31,818
PCSU 5% direct charge (listed under expense category A. Personnel)	***$15,152***
Total:	$31,818

Narrative Justification

- Research Corporation of the University of Hawaii (RCUH) is the fiscal agent and employer of the West Maui Mountains Watershed Partnership staff
- Pacific Cooperative Studies Unit (PCSU) is an arm of the University of Hawaii under the Dept. of Botany that facilitates watershed and invasive species conservation and research.

County of Maui
Department of Water Supply
Watershed Protection Grants

G. SUPPLIES & MATERIALS

Fiscal Year: **2017**
Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Fence Maintenance Materials	$2,725
Operational Field Supplies	$1,000
Office Supplies	$975
Volunteer Supplies/hand Tools	$500
500 Native out plantings	$2,000
Fuel for Vehicles and Equipment	$2,000
HBT Herbicide Capsules	$6,500
Total:	$15,700

Narrative Justification

- Fencing material is for maintenance and improvement of existing fences.
- Operational supplies may be items which do not neatly fit within field crew costs such as herbicide, disposables (like paper towels, trash bags), consumables (weed whacking string, chain saw bar oil) decontamination/cleaning supplies etc.
- Office supplies may include paper, printer ink, small machine repair, computer software and licenses, etc.
- Volunteer supplies consist of personal protective equipment. Hand tools and herbicide tools.
- The native planting will be used to restore areas where we have removed invasive plants. Estimate $4 per plant.
- Combined fuel cost for the three project vehicles is ~$150 to ~$250 per month. Small amounts are also procured for weed trimmers, chain saws, etc.
- HBT herbicide covers manufacturing and shipping. Budget may be substituted with sprayball or other weed control related operations.
- Water filtration is needed for drinking water and sanitation. Cost is for replacement filters and/or a new filter system.

County of Maui
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I. OTHER

(by type & nature)

Fiscal Year: **2017**

Organization: **West Maui Mountains Watershed Partnership**

Breakdown of Expenses	Amount Requested
Geodatabase Maintenance	$5,000
Data Entry Computers, Tablets & Software Licenses	$1,500
Security Alarm Service	$400
Web Site Maintenance	$700
Printing and Publication	$300
Vehicle Repairs and Maint.	$2,000
Total:	$9,900

Narrative Justification

- Ongoing maintenance of the Geodatabase is critical to streamlining the data process. WMMWP Access databases and nomad data loggers will be kept in order. Designing data logger functions, correcting data systems and maintaining database function is critical to producing reliable and reportable results.
- We have 10 computers and 1 laptop which we replace/upgrade at a rate of 1 to 2 computers per year (~$800 per unit) to keep hardware and software current. Tablets (including protection and data applications) are ~$250 per unit. GIS licenses are approximately $100 per unit per year.
- Security is essential in our area. We have been burglarized twice in the last five years. Cost is $37.50 per month for 12 months.
- Printing and Publication is often need for outreach materials and interactive displays. Water story presentations will require large format maps of water systems, which can cost up to $200 each.
- Vehicle repairs, maintenance, registration, safety for three project vehicles: Toyota Tacoma, Ford F350, and Chevrolet flatbed.
  - Tacoma costs: $325 registration + $40 safety
  - F350 costs: $540 registration + $40 safety
  - Flatbed costs: $40 safety (State registered)
  - Repairs can include routine 5,000-mile servicing, new tires and installation, alignment, filter replacement, etc.

GENERAL TERMS AND CONDITIONS – DWS GRANTS

In consideration of grant COUNTY funds, GRANTEE agrees to the following conditions in the use and administration of COUNTY funds. In the event the following conditions conflict with any term, provision, condition and/or covenant contained in the body of the Grant Agreement, the terms, provisions, conditions and/or covenants contained in said body shall prevail.

PAYMENTS

1. GRANTEE shall submit to the COUNTY written Request for Payment. Each request shall be authenticated as to accuracy by the GRANTEE, and verified by the designated COUNTY departmental officer. Each request shall include the following:
   a. Certification by the GRANTEE that the work for which payment is requested was performed in accordance with the terms of this Agreement;
   b. Certified payroll records for the applicable time period or phase for which payment is being requested; and
   c. Copies of all contracts, bills, invoices and purchase orders which support the request shall:
      i. Be of certified copy of the original document.
      ii. Be on the letterhead of the respective contractor or subcontractor requesting payment.
      iii. Be signed by an authorized official of the GRANTEE.
      iv. Identify the Project, the nature of the work or materials provided, and the specific phase of the Project for which the work or materials were provided.

2. The COUNTY may withhold any or all payments to the GRANTEE if the amount of payment as requested is, in the COUNTY'S determination, unreasonable or does not comply with the terms of this Agreement.

3. GRANTEE shall not alter SCOPE OF WORK which provided the justification for the grant without first obtaining the prior written consent of COUNTY. GRANTEE shall inform COUNTY of any proposed changes to the budget allocations or project description or schedule outlined herein.

RECORDS AND REPORTING

4. GRANTEE shall keep records and prepare reports, including detailed, separate financial records relating to ALL GRANT FUNDS. All accounts shall be prepared and maintained according to generally accepted accounting principles and as otherwise provided by law. GRANTEE shall maintain such accounts and documents as will serve to permit expeditious determination to be made at any time of the status of funds within the award, including the disposition of all monies received from COUNTY and the nature and amount of all charges claimed to be against such funds.
5. Unless otherwise required in the Agreement or in related application submittals,

GRANTEE shall supply COUNTY with a copy of its audited annual financial statements, prepared by its Certified Public Accountant(s). GRANTEE shall, upon request of COUNTY or State of Hawaii, provide COUNTY and State of Hawaii full access to inspect or audit GRANTEE'S records, report books, files, and other financial records and documents to allow COUNTY and State of Hawaii to determine compliance with the terms of this Agreement, measure program effectiveness, and assure proper expenditure. GRANTEE shall cooperate fully and assist the COUNTY and State of Hawaii in any such audit or inspection.

6. GRANTEE shall provide COUNTY written quarterly narrative progress reports regarding the Project and the use of grant funds within thirty (30) calendar days following the end of each report quarter. GRANTEE'S quarterly status reports shall contain the following information: summary of program status in relation to goals; objectives and scheduled action steps outlined in the grant proposal; numbers and descriptions of people or businesses served; financial status report of COUNTY funds used; and narrative report, including progress in meeting performance standards and economic self-sufficiency, if appropriate.

7. GRANTEE shall comply with all requests of the State of Hawaii for information and reports regarding the Project and GRANTEE'S operations.

GRANT AWARD RESTRICTIONS

8. GRANTEE shall not use grant funds to compensate its employees more than the wages then prevailing in the State of Hawaii for employees with similar skills and abilities.

9. GRANTEE shall not use grant funds for lobbying purposes or activities.

10. GRANTEE shall not use any grant funds for purposes of entertainment or perquisites. For purposes of this Agreement, "perquisites" means a privilege provided or service rendered by GRANTEE to an employee, officer, director, or member of GRANTEE to reduce that individual's personal expenses.

11. Grant funds shall not be used to recruit or convert a person to a new faith, institution, or cause.

NON-COMPLIANCE, SUSPENSION AND TERMINATION

12. GRANTEE'S failure to faithfully perform any part of this Agreement or any of the additional Conditions herein shall constitute noncompliance, and:
    a. should the noncompliance continue for thirty days after written notice thereof is delivered to GRANTEE or mailed to its last known address; or,
    b. if such noncompliance cannot be reasonable cured in thirty days, but GRANTEE has failed to commence to cure such noncompliance and to continue to diligently use its best efforts to cure such noncompliance; or

c. if GRANTEE shall become bankrupt; or,

d. if GRANTEE fails to perform any of the terms of this Agreement, or abandons or substantially suspends any part of this Agreement Scope of Work, the COUNTY may, at its sole discretion, take any one or more of the following actions:

   i. Withhold grant fund payments pending correction of the non-compliance by the GRANTEE;

   ii. Disallow all or part of the cost/expense of the activity or action not in compliance;

   iii. Suspend or terminate, wholly or partially, the current award of this Agreement with the GRANTEE;

   iv. Withhold additional award(s) to the GRANTEE; and

   v. Terminate this Agreement without service or notice or legal process and without prejudice to any other remedy or right of action for breach of contract.

Upon termination of this Agreement, all finished or unfinished documents, data, studies, and reports purchased or prepared by the GRANTEE pursuant to this Agreement shall be transferred to the COUNTY.

13. Any costs incurred by the GRANTEE resulting from any obligations incurred by GRANTEE during suspension or after termination of this Agreement are not allowable unless the COUNTY authorizes such costs in the Notice of Suspension or Termination issued to the GRANTEE. The determination of eligible costs shall be made by the COUNTY in its sole discretion.

Further, the COUNTY may terminate this Agreement without cause by giving written notice to the GRANTEE thirty (30) calendar days before the effective date of such termination.

OTHER GRANT REQUIREMENTS

14. GRANTEE shall give the COUNTY and, if applicable, the State of Hawaii appropriate recognition in all grant-funded programs and printed materials.

15. GRANTEE shall comply with its articles of incorporation and/or bylaws and all relevant COUNTY, State and/or Federal rules and regulations concerning its policies and operations.

16. GRANTEE shall not discriminate either in the hiring of staff, use of volunteers, use of facilities, or delivery of client services on the basis of sex, sexual orientation, national origin, age, race, color, religion or disability. GRANTEE shall comply with all applicable federal and state laws prohibiting discrimination.

17. GRANTEE shall comply with all applicable federal, state and COUNTY licensing requirements and with all applicable accreditation and other standards of quality generally accepted in the field of GRANTEE'S activities.

18. If GRANTEE is a nonprofit organization, GRANTEE shall establish and be governed by bylaws or policies which shall include provisions relating to nepotism and management of potential conflict-of-interest situations, as required by Section 3.36.040(c) of the Maui County Code.

TERMINATION OF GRANT AGREEMENT (GRANT CLOSE OUT)

19. GRANTEE shall not dispose of any real or personal property acquired with grant funds received under this Agreement without first receiving prior written consent of the COUNTY. Should GRANTEE cease to use any real or personal property acquired with grant funds for purposes described in this Agreement, GRANTEE shall either:
    a. Pay the COUNTY the current fair market value of the asset; or
    b. Transfer the control of the asset to the COUNTY.

20. Upon expiration or termination of this Agreement, the GRANTEE shall transfer to the COUNTY:
    a. Any COUNTY funds on hand at the time of termination;
    b. Any account receivables attributed to the use of COUNTY funds; and
    c. Any real and/or personal property acquired or improved in whole or in part with COUNTY funds.

21. FINAL REPORT - Within thirty (30) days after expiration of the time of performance, GRANTEE shall submit to COUNTY a final Project report in a form satisfactory to COUNTY documenting GRANTEE'S efforts toward meeting the requirements of this Agreement, an inventory of all equipment costing individually $500.00 or more acquired with funds provided under this Agreement, and a list of expenditures incurred in the performance of this Agreement.

    GRANTEE'S final project report shall contain information which will be completed using the template below (Final Report Template - Form 4.4)

County of Maui
Department of Water Supply

Watershed Protection Grants

Fiscal Year 2017

Form 4.2

Reimbursement Request Form

Organization Name _____

Expense Categories	Grant Amount	Payment #1	Payment #2	Payment #3	Final Payment	Balance
Personnel (Payroll Taxes & Fringes						
Transportation						
Contractual (e.g. helicopter)						
Utilities (e.g. telephone/cell, water electricity, etc)						
Travel						
Field Crew Costs						
Supplies, Materials & Equipment						
Administrative & Overhead Costs (not to exceed 10% of total grant amount)						
Other costs						
Total						

Form 4.3

Sample Format for Quarterly Reporting

1. Background (only needed for first report)

2. Tasks Completed during the period: (as applicable)
   a. Animal Control
      i. Miles of fences surveyed
      ii. Number of animals removed (number or %)
   b. Weed Control
      i. Acres surveyed (number)
      ii. Number of weeds removed (%)
   c. Invasive Species
      i. Acres surveyed (number)
   d. Invasive Species Removed (%)
      i. Monitoring results
      ii. Number of Aalii/Koa planted
      iii. Installed exclosures
      iv. Number of Volunteers recruited; number of volunteer hours

3. Budget Summary – expenses should be in accordance with the approved grant agreement budget, if revision is needed, please see guidelines in Item #4.
   a. Justification for delay in the performance of deliverables (e.g. weather, under staff, season for planting, etc.)

      _____
      _____
      _____

   b. Expenses incurred during the performance period (please attach copy of receipts)

4. Budget Revision Guidelines
   a. Budget deviations of **less than 20%** per budget item are allowed without a formal budget revision
   b. Budget deviations of **more than 20%** per budget item require a written budget revision request submitted in **advance.**
   c. Moving 10% of costs between "Payroll" and "Other Costs" budget categories is **NOT** permitted
   d. Budget revision request (s) can be submitted anytime during the project period prior to the end of the 3rd quarter.
   e. The **Request for Grant Budget Revision** form must be used to make changes which do not require a contract amendment. Budget Revision Table should reflect entire budget, including items with no changes.

Form 4.4

FINAL REPORT TEMPLATE

BACKGROUND

Complete a description of how your program achieved the goals, objectives and scheduled action steps outlined in grant proposal.

GOALS/OBJECTIVES

Provide a list of the goals and objectives from your grant application.

BENEFITS to MAUI COUNTY

Describe how your project/program has benefited the people of Maui County in relation to the goal of the DWS (providing clean water more efficiently). Keep in mind that Maui County DWS manages approximately 36,000 services on Maui and Molokai, and that the funds provided to you are from their revenues, not the general fund (tax base for all of the residents and businesses of Maui County). Include the numbers and descriptions of people and/or businesses served (please include an Excel table).

TASKS COMPLETED FOR FY 17

Provide in detail what tasks you have completed per your grant application (and any additional tasks as appropriate). Please include maps, geospatial data, photos and other documentations as appropriate.

STAFF EMPLOYED

Include the number of Full Time Employees (FTEs) as paid by these grant funds; total number of hours worked during the fiscal year, and total amount of grant funds spent in salary (including benefits and fringe).

INVENTORY OF EQUIPMENT (costing individually $500 or more acquired with DWS grant)

Equipment Item (name and brand)	Value when purchased	How used	When acquired

AMOUNT OF FUNDING LEVEREGED

Please include an Excel table that identified the amount of funding you received from DWS, amount received from other sources. Please identify all sources by name, and state/federal/county government and or private, nonprofit entity. (PLEASE USE FORM 4.6)

FUNDING NEEDED AND WHAT YOU COULD DO IF THERE WAS MORE FUNDING

Provide an explanation of how you would spend additional grant funds if you had them. Please include whether or not new initiatives could be started, if these would include additional outreach opportunities, new equipment to be purchased and or if you had additional revenues whether it may impact amount of potential revenues to be leveraged.

CONSEQUENCES OF A DECREASE IN FUNDING

If, during the course of budget, there was to be a decrease in funding available for watershed programs- how would this impact your program/project? Please describe and if possible provide documentation as to whether you would lose staff, amount of time previously spent on specific activities would have what type of detrimental effect? How would a decrease in funding impact any leveraging activities (funds and/or resources from other sources)?

County of Maui
Department of Water Supply

Watershed Protection Grant

Fiscal Year 2017

Leveraged Funds – FY 2016

Grantee: _____

SOURCE OF FUNDS	Type of Entity (government/ private/ nonprofit	Amount of Funds Leveraged	
		Cash	In-Kind

Form 4.6

County of Maui
Department of Water Supply
Water Resources and Planning Division

REQUEST FOR GRANT BUDGET REVISION

Grantee _____ **Contract #**_____

Revision Requested for: ___ 1st Qtr ___ 2nd Qtr ___ 3rd Qtr **Revision #** _____

	APPROVED BUDGET	CHANGE + / (-)	REVISED BUDGET	JUSTIFICATION (ATTACH ADDITIONAL SHEET IF NEEDED)
Personnel (Payroll Taxes & Fringes				
Transportation				
Contractual (e.g. helicopter)				
Utilities (e.g. telephone/cell, water, electricity, etc)				
Travel				
Field Crew Costs				
Supplies, Materials & Equipment				
Administrative & Overhead Costs (not to exceed 10% of total grant amount)				
Other costs				
Total Budget				

_____

Print Name and Title Signature Date

DWS Use	Date Received:	☐ Approved ☐ Denied	WRPD Manager:	Date Approved: