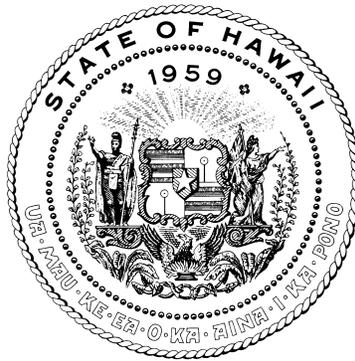


**REPORT TO THE TWENTY-SEVENTH LEGISLATURE  
REGULAR SESSION OF 2014**

**RELATING TO THE NATURAL AREA RESERVES SYSTEM,  
NATURAL AREA PARTNERSHIP PROGRAM,  
AND  
THE FINANCIAL CONDITION OF THE  
NATURAL AREA RESERVE FUND**



**PREPARED BY**

**STATE OF HAWAI'I  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE**

**IN RESPONSE TO SECTION 195-6.6, HAWAI'I REVISED STATUTES**

**HONOLULU, HAWAI'I  
DECEMBER 2013**

## TABLE OF CONTENTS

<b>List of Acronyms</b>	<b>3</b>
<b>1. Natural Area Reserves System Activities and Accomplishments</b>	<b>4</b>
<b>1.1 “The Rain Follows the Forest” Watershed Initiative</b>	<b>4</b>
<b>1.2 Natural Area Reserves System Management</b>	<b>5</b>
<b>1.3 Reserve Activities and Accomplishments by Island</b>	<b>8</b>
<b>1.4 Rare Plant Program</b>	<b>15</b>
<b>1.5 Native Invertebrate Program (NIP)</b>	<b>17</b>
<b>1.6 Financial Report</b>	<b>20</b>
<b>1.7 Plans and Management Objectives for the Next Fiscal Year</b>	<b>20</b>
<b>2. Natural Area Partnership Program</b>	<b>22</b>
<b>2.1 Description of Activities and Accomplishments</b>	<b>22</b>
<b>2.2 Financial Report</b>	<b>26</b>
<b>3. Compliance with Chapter 42F, Hawai‘i Revised Statutes (HRS)</b>	<b>26</b>
<b>4. Status of Public Hunting Opportunities</b>	<b>26</b>
<b>5. Other Programs Funded through the Natural Area Reserve Fund</b>	<b>27</b>
<b>5.1 Watershed Partnerships Program</b>	<b>27</b>
<b>5.2 Information and Education Program</b>	<b>42</b>
<b>6. Analysis of Problems and Issues Encountered</b>	<b>44</b>
<b>7. Conclusion</b>	<b>45</b>
<b>8. Financial Report for the Natural Area Reserve Fund</b>	<b>45</b>
<b>9. Appendix</b>	
<b>A. NARS and Watershed Management Budget Summary</b>	<b>46</b>
<b>B. Watershed Initiative Projects FY 14 (Map and Summary Table)</b>	<b>47</b>

## **LIST OF ACRONYMS**

**BLNR** Board of Land and Natural Resources  
**CIP** Capital Improvement Project  
**DLNR** Department of Land and Natural Resources  
**DHHL** Department of Hawaiian Homelands  
**DOE** Department of Education  
**DOFAW** Division of Forestry and Wildlife  
**EMWP** East Maui Watershed Partnership  
**EMoWP** East Moloka‘i Watershed Partnership  
**FY** Fiscal Year  
**GIS** Geographic Information System  
**HAWP** Hawai‘i Association of Watershed Partnerships  
**HDOA** Hawai‘i Department of Agriculture  
**HEEA** Hawai‘i Environmental Education Alliance  
**HISC** Hawai‘i Invasive Species Committee  
**HRS** Hawai‘i Revised Statutes  
**KISC** Kaua‘i Invasive Species Committee  
**KWA** Kaua‘i Watershed Alliance  
**KWP** Kohala Watershed Partnership  
**KMWP** Ko‘olau Mountains Watershed Partnership  
**LHWRP** Leeward Haleakalā Watershed Restoration Partnership  
**MISC** Maui Invasive Species Committee  
**MoMISC** Moloka‘i Invasive Species Committee  
**NARF** Natural Area Reserve Fund  
**NAR** Natural Area Reserve  
**NARS** Natural Area Reserves System  
**NAPP** Natural Area Partnership Program  
**NIP** Native Invertebrate Program  
**NPS** National Park Service  
**OISC** O‘ahu Invasive Species Committee  
**OANRP** O‘ahu Army Natural Resources Program  
**PEP** Plant Extinction Prevention  
**PLT** Project Learning Tree  
**RC&D** Resource Conservation and Development  
**RCUH-PCSU** Research Corporation of UH -Pacific Cooperative Studies Unit  
**SEP** Snail Extinction Prevention (SEP) Program  
**T&E** Threatened and Endangered  
**TMA** Three Mountain Alliance  
**TNC** The Nature Conservancy  
**UH** University of Hawai‘i  
**USDA - FS** United States Department of Agriculture Forest Service  
**USFWS** United States Fish and Wildlife Service  
**USGS** United States Geological Survey  
**WMMWP** West Maui Mountains Watershed Partnership  
**YCC** Youth Conservation Corps

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Section 195-6.6, Hawai‘i Revised Statutes (HRS), requires an annual comprehensive status report on the Natural Area Reserves System (NARS), the Natural Area Partnership Program (NAPP) and the financial condition of the Natural Area Reserve Fund (NARF). This report will include a description of activities and accomplishments, compliance with Chapter 42F, HRS, analysis of the problems and issues encountered, status of public hunting opportunities, plans and management objectives for the next fiscal year (FY), activities and goals for other programs funded through NARF, and a financial report for the NARF.

**1. NATURAL AREA RESERVES SYSTEM ACTIVITIES AND ACCOMPLISHMENTS**

**1.1 “THE RAIN FOLLOWS THE FOREST” WATERSHED INITIATIVE**

NARS staff coordinated the watershed initiative, a priority of Governor Neil Abercrombie's “A New Day in Hawai‘i” plan. “The Rain Follows the Forest – A Plan to Protect Hawai‘i’s Source of Water” implements these central goals of the Abercrombie administration. The plan, unveiled by the Governor in November 2011, seeks to double the acreage of priority watershed forests protected by 2021. The initiative seeks to protect 90,000 more acres of forest and maintain existing protected areas, requiring approximately \$11 million per year.

Following the plan’s announcement, the Legislature allocated \$2.5 million in special funds (provided by the NARF) and \$2.5 million in general obligation bonds for Capital Improvement Projects (CIP) for FY 13. All projects are underway and CIP accomplishments are listed below.

<b>LNR 407 WATERSHED CIP ACCOMPLISHMENTS SUMMARY FY 13</b>		
<b>General Obligation Bond Expenditure Projects</b>		<b>FY13 Accomplishments</b>
Kauai	Hono O Na Pali Natural Area Reserve	2.7 mi of fence aligned, contractor initiating construction.
Oahu	Ewa Forest Reserve	3.8 mi of fence aligned, contractor awarded.
Maui	Kahikinui Forest Restoration	2.7 mi of fence aligned, contractor initiating construction.
Maui	Hanawi Natural Area Reserve	1 mi of fence constructed.*
Maui	Hana Forest Reserve	0.75 mi of fence aligned, 0.25 mi cleared.
Hawaii	Puu O Umi Natural Area Reserve	2 mi of fence constructed.*
Hawaii	Mauna Kea Forest Restoration Project	Project completed. 19,725 seedlings planted on 81 ac, 3,594 volunteer hours donated.
Hawaii	Kau Forest Reserve	5.5 mi of fence aligned.

\*Included in Natural Area Reserves System section of this report.

This funding has resulted in the projected protection of over 15,000 acres, maintenance of approximately 160,000 acres, and creation or retention of 61 local jobs through calendar year

2013. Special funded project information is provided in the “Watershed Partnerships” section of this Report. Appendix B maps and lists the projects selected from FY 14.

The Legislature provided \$3.5 million in general funds and \$5 million in general obligation bond funding for FY 14, and \$2.5 million in general obligation bond funding for FY 15 for the initiative. The Legislature also provided Manukā Natural Area Reserve (NAR) with \$3.5 million for fence construction in the fiscal biennium. The biennium bond funding is projected to fund the protection of more than 40,000 acres in watershed forests and dryland ecosystems statewide.

## **1.2 NATURAL AREA RESERVES SYSTEM MANAGEMENT**

The NARS consists of 20 reserves comprised of 123,431 acres on five islands. NARS was established to protect the best remaining native ecosystems and geological sites in the State. Annual activities are based on the long-term management plans developed for each reserve and adaptive management principles, to enable effective response to changing conditions and new threats. Management policies approved by the NARS Commission and the Board of Land and Natural Resources (BLNR) continue to be the general guide for rule-making and development of management plans for NARS. While NARS is based on the concept of protecting native ecosystems, as opposed to single species, many threatened and endangered (T&E) plants and animals benefit from the protection efforts through NARS. For detailed information on the NARS, please go to <http://dlnr.hawaii.gov/ecosystems/nars/>

In FY 13, staff continued to implement the NARS Strategic Plan by developing operational plans for each island program to prioritize and coordinate future activities to meet statutory mandates. Major management activities involve fencing and control of feral ungulates (wild, hoofed animals such as cattle, sheep, deer and pigs), control of other invasive species (weeds, small mammalian predators), rare plant restoration, fire prevention and control, maintenance of infrastructure, and public outreach.

NARS staff conducted ground and aerial surveys for feral ungulates. Fencing continues to be an important tool to reduce animal populations. Over 151 miles of existing fences were inspected and maintained to prevent ungulate ingress and damage to resources, and new fences were constructed. Public hunting, staff control using trapping, snaring (in remote/fenced areas), and aerial shooting were used to reduce non-native ungulate populations. The type of control measure used depends on the resources available, the reserve location, effectiveness of public hunting, terrain, and ungulate abundance. NARS staff continues to work with hunting organizations, the Division of Forestry and Wildlife (DOFAW) Wildlife Program, and others to accomplish control goals while minimizing conflict with the recreational hunting community.

Invasive weed control is ongoing in every reserve, and priority weeds have been identified. Volunteers provide significant manual labor to assist in weed control. NARS staff also coordinates efforts with the respective Island Invasive Species Committees where possible, particularly when responding to new weed outbreaks.

Monitoring of rare plant populations, collection of seeds and propagules, and outplanting of T&E plants are ongoing to protect and enhance the rare plants found within NARS.

Staff prevented fires in and around reserves, by controlling invasive species to reduce fuel loads, constructing fuel breaks, and creating water-holding infrastructure. NARS staff also worked to control forest fires, as part of the DLNR-DOFAW Fire Response Team.

Maintenance of infrastructure is an ongoing activity. Staff maintained, installed or replaced over 500 information and boundary signs. Approximately 133 miles of existing trails were maintained in various reserves, primarily for management purposes. Existing helipads were maintained to facilitate management and to provide access for emergencies. Over 15 management shelters were maintained for long-term management actions. Over 85 miles of roads, mostly on Hawai‘i and O‘ahu, were maintained to provide hunter and management access.

Staff training for needed skills included wilderness first aid/cardiopulmonary resuscitation, defensive driving, firearms safety, fire response, all terrain vehicle operation, helicopter safety, chainsaw, pesticide use, ungulate control methods, procurement, ArcGIS, and leadership skills. Staff attended the Hawai‘i Conservation Conference, an annual conference attended by nearly 1,000 resource management professionals. Finally, NARS staff continued the successful “exchange program” between districts to share field methods and develop new skills.

Outreach and volunteer projects increased the public’s appreciation of the NARS and Hawai‘i’s unique natural resources. Staff led volunteer trips, presentations, and guided hikes for numerous groups, including visiting dignitaries, cooperating agencies, school groups, and the University of Hawai‘i (UH). NARS staff responded to multiple requests for information from the public (forwarded by the DLNR Public Information Officer) and created press releases for news media statewide. NARS staff continued participation with the national Natural Areas Association, the Hawai‘i Conservation Alliance, the Pacific Island Climate Change Co-operative, the Forest Stewardship Advisory Committee, and the Hawai‘i Conservation Conference.

Finally, NARS staff continues to leverage resources and increase effectiveness by working with watershed partnerships and other federal, state and private conservation partners. These partnerships provide additional funding for NARS from federal and private sources, as well as in-kind staff and operational support.

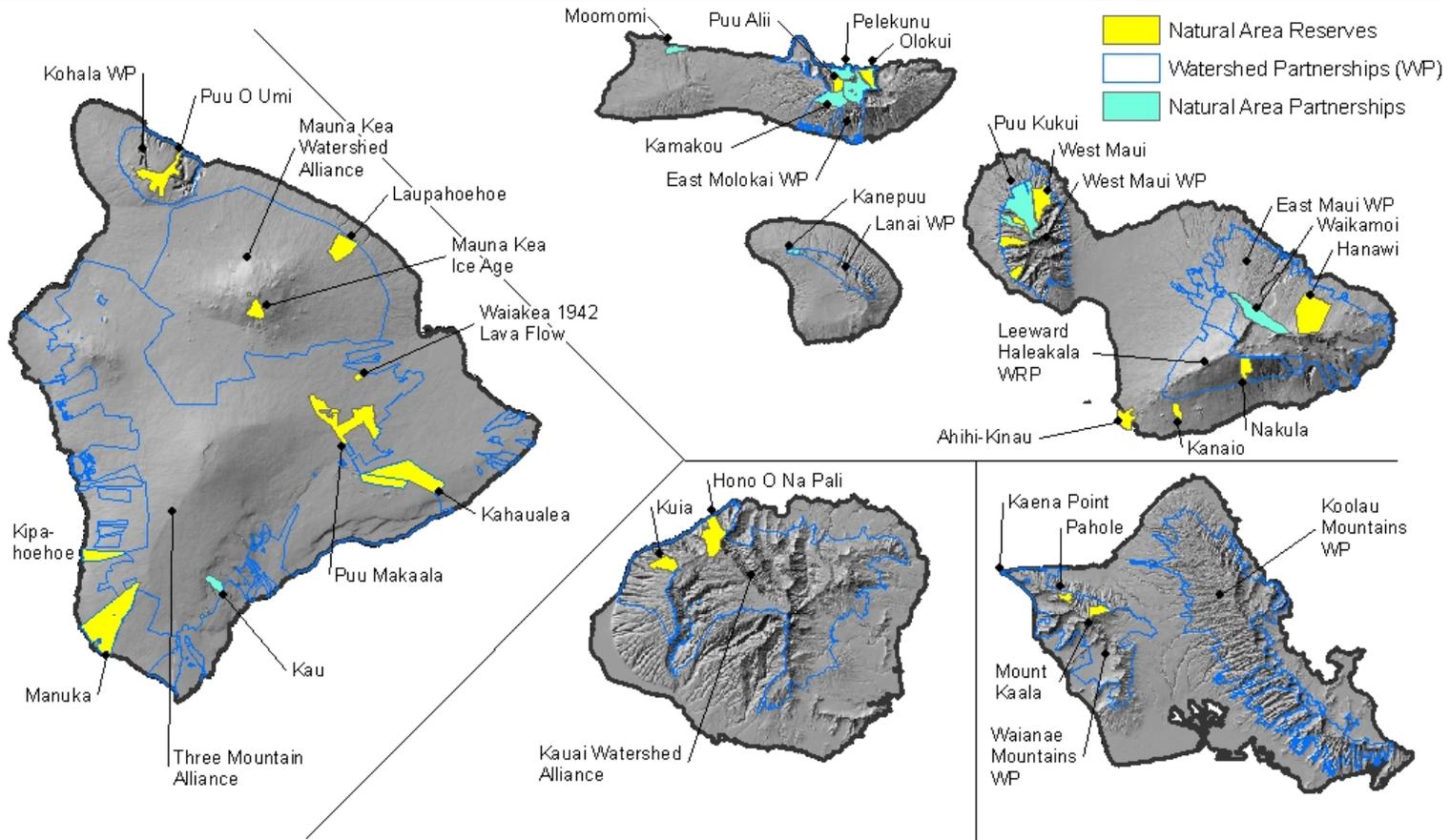
### **NARS Commission**

The NARS Commission was established by statute as an advisory body to the DLNR under §195-6, HRS. The NARS Commission discusses and recommends areas to be added to the NARS to ensure that a wide spectrum of unique natural areas is preserved for current and future generations, and advises management of existing reserves.

- The NARS Commission met twice in FY 13.
- Act 004, established a cultural representative position for the NARS Commission.
- BLNR or its authorized representative, with the approval of the NARS Commission, recommended the issuance of 48 Special Use Permits for research, education, large group hikes, educational and commercial filming.
- Experimental Tropical Forest permits for Laupāhoehoe NAR are issued through the United States Forest Service, as authorized.



# Natural Area Reserves Watershed Partnerships & Natural Area Partnerships



DOFAW 587-4170. October 2013.

## 1.3 RESERVE ACTIVITIES AND ACCOMPLISHMENTS BY ISLAND

### Kauai

Ongoing management includes maintenance of existing fences, invasive weed control, and rare plant protection through seed collection, propagation, and out planting. Weeds controlled in reserves included 24,431 *Psidium cattleianum* (strawberry guava), 1,036 *Lantana camara* (lantana), 2,201 *Rubus argutus* (blackberry), 755 *Grevillia robusta* (silk oak), 1,386 various grasses and 13,401 individuals of other weed species. In addition to work inside reserves, staff participated in fire restoration, invasive weed control, and rare plant protection and outplanting with other DOFAW programs and partners of the Kauai Watershed Alliance (KWA). Staff assisted with the control of three forest fires that destroyed 4,000 acres. Specific accomplishments within individual reserves include:

*Hono o Nā Pali* (3,150 acres; mesic and wet forest with perennial streams): surveyed fence lines for future strategic fence installations; surveyed two sites for remote field station infrastructure, installed invasive species and ungulate monitoring transects. The predator control team monitored three sites, removed 9 non-native predators, and documented predation by feral pigs on rare seabirds. The NARS program selected a contractor to install a 3.3 mile strategic fence to keep pigs from entering the Reserve. The program successfully managed the complete retrofit of the bog fences to prevent deer access. Public hunters removed 141 pigs and 47 goats from the reserve (Hunting Units G and E) in 1,133 hunting trips.

*Kuia* (1,636 acres; dry and mesic forest with perennial streams): Completed the installation of the 85 acre fenced management unit which contains T&E species as well as old growth mesic forest. The program completed an invasive species distribution survey within the fence, mapped and inventoried rare plant enclosures; maintained and repaired damaged fencing; conducted intensive weed control within fenced enclosures; installed invasive species and ungulate monitoring transects; and planted 2,590 natives within the Milolii fire restoration area as well as listed T&E species within fenced enclosures. The program controlled ungulates with public hunters inside fenced units and enlisted the service of 63 volunteers which contributed a total of 1,160 volunteer hours. Public hunters removed 87 pigs, 61 goats and 4 deer from the reserve (Hunting Unit H).



### O'ahu

Ongoing management includes weed control, predator monitoring and removal, ungulate removal, fence construction and maintenance, T&E species recovery, habitat protection, and collaborating with public and private partners to protect and preserve natural resources. Staff supervised work done by O'ahu Army Natural Resource Program (OANRP) under an annual

NARS special use permit. OANRP conducted management for T&E plants and animals in three reserves and supported research into answering management questions that will benefit the NARS as a whole. NARS staff conducted prerelease monitoring of strawberry guava to support eventual release of the Hawai'i Department of Agriculture approved biocontrol agent. Staff also conducted volunteer and outreach events to community, school, and elected officials.

NARS staff contributed expertise and assistance in other DOFAW lands by surveying and monitoring rare plants, collecting seeds and cuttings from T&E plants, and controlling invasive species. Staff continued herbicide field trials on four problematic invasive plant species to develop more effective control methods. NAR staff conducted native and rare plant work at various forest reserves and the Kuaokala Game Management Area. DOFAW continued to house the Koolau Mountains Watershed Partnership (KMWP), Waianae Mountains Watershed Partnership (WMWP) and O'ahu Plant Extinction Prevention Program (PEP) at its baseyard. Working in close proximity to these partners fosters greater collaboration and aids in implementing NARS goals.

In addition to volunteer service trips to each Reserve, O'ahu DOFAW continued its partnership with Mililani High School and developed and implemented the Adopt-A-Forest Stewardship and Learning Program for O'ahu schools. Five student learning trips were conducted along with hosting one year round AmeriCorps intern, two summer interns, and two YCC summer teams at Pahole and Ka'ala NARs.

Specific accomplishments within individual reserves include:

*Pahole* (658 acres; dry and mesic forest): Ungulate control work including fence monitoring and maintenance is focused on 5 fences which almost entirely enclose the NAR. In FY 13, NARS staff completed a fence retrofit to exclude piglets, led two escorted public hunts (74 volunteer hours) and removed 17 pigs. Wildlife game cameras and GPS dog tracking collars were used to aid in the control effort. Weeding primarily targeted *Schinus terebinthifolius*, *Psidium cattleianum*, and *Toona ciliata*, *Desmodium intortum*, *Ehrharta stipoides*, *Neomotonia wightii*, *Setaria palmifolia*, *Sigesbeckia orientalis*, *Platymiscium stipulare*, and *Pterolepis glomerata*. Staff removed 127 mature and 1,189 immature incipient weeds. Volunteers donated 166 hours to control weeds. Additional management of the NAR included maintenance of the Mokuliea trail, and planting 1,006 common and rare native plants. Staff supported research on koa wilt, 'ōhi'a diversity and *Sapindus oahuense* germination. OANRP conducted a trial on a new multiple catch rat trap that has been proven effective and will likely improve rodent control efforts state wide. Staff conducted surveys for *Achatinella mustilina* and maintained a predator proof fence protecting a population of these critically endangered snails.

*Ka'ala* (1,100 acres; dryland to wet shrub forest): Ungulate control work focused in fenced areas and on goat control in the adjacent Mokulē'ia Forest Reserve to reduce the potential for goat ingress into the NAR. Staff scoped potential fencelines, controlled feral pigs and goats in the NAR and within the 300 acre Manuwai fence unit, and conducted one aerial goat survey in the NAR and adjacent Forest Reserve. OANRP maintained fences, monitored ungulate activity and controlled 10 feral ungulates. Staff installed a small water catchment in order to support control of invasive sphagnum moss and maintained a storage shed and composting toilet facility in

collaboration with partners and volunteers. Staff monitored rare plants in the lower western portion of the NAR. Staff controlled weeds including *Spaghnum palustre*, *Hedychium gardnerianum*, *Juncus effusus*, *Psidium cattleianum* and *Leptospermum scoparium*. Volunteers donated 329 hours to control weeds.

*Ka'ena Point* (12 acres; coastal dune ecosystem): Staff has been working on an update to the Kaena Point NAR management plan. In an effort to improve the coastal dune ecosystem, NARS, in partnership with the Wildlife Society and the U.S. Fish and Wildlife Service (USFWS) completed a predator proof fence in 2011. This fence encloses approximately 65 acres and excludes predators including dogs, cats, mongoose, rats, and mice. Staff maintained the fence and controlled predators inside the fence and in a buffer zone outside the fence, primarily through rodent baiting and trapping (159 mice, 13 rats removed). Pacific Rim Conservation LLC has been the project managers for rodent control operations. Predator control has had a positive impact on seabird populations. No conclusive depredations of seabirds were reported. During the breeding season, twice as many Wedge-tailed Shearwater chicks fledged as last year (3,274 vs. 1,174), 32 Laysan Albatross chicks fledged, and a newly established colony of Black Noddy seabirds was documented, all attributed to the predator free status of the area. Other accomplishments include installation of Watchable Wildlife and other signs and completion of a wedge-tailed shearwater census. 144 common and rare native plants were planted inside the predator proof fence area. Staff continued to implement emergency actions of the DLNR Ka'ena Point Stewardship Group's final action plan including: designated road and sign maintenance and protecting the sandy cove from off road vehicles by boarding the area with boulders. Weed control continues on *Leucaena leucocephala*, *Achyranthes aspera* var *aspera* and *Verbecina encelioides*. Volunteers donated 18 volunteer hours weeding.

*BLNR Approved Poamoho NAR* (1,500 acres; mesic to wet forest): The BLNR approved this area as a NAR and an Executive Order is in process. CIP funds for the 1,500 acre watershed protection fence were secured as part of "The Rain Follows the Forest" initiative and matched by a \$300,000 U.S. Department of Agriculture Forest Service (USDA-FS) Forest Health grant. NAR staff flagged and conducted biological surveys along the northern unit fence line. Infrastructure maintenance on the Poamoho cabin was conducted to support an increase in staff and partner use of the facility. A pig tracking study was initiated to determine animal movement over time to aid in ungulate management in the NAR and adjacent Ewa Forest Reserve. NARS and U.S. Geological Survey (USGS) entered into an agreement to conduct a paired watershed study to document changes in water quantity as a result of watershed protection activities. NAR staff conducted *Tibouchina herbacea* surveys and control spending a total of 19 staff hours. Volunteers donated 90 hours to control *L. scoparium*, *P. cattlenium*, and *Tibouchina herbacea*

*BLNR Approved Kaluanui NAR* (450 acres; mesic to wet forest and cliff): Staff conducted a public hearing and received BLNR approval for a NAR designation, and an Executive Order is in process. Staff secured \$200,000 from the USFWS Partners for Fish and Wildlife program to expand the fence from 450 to 550 acres and include adjacent privately owned lands to protect T&E plants and animals and watershed function.

*Other Native Ecosystems*: Staff worked with KMWP surveying and controlling goats and Mouflon sheep on or around the Makapu'u cliffs (removed 10 sheep and 2 goats). O'ahu staff

also supported an effort with KMWP to control an isolated goat population on the northern ridge of the Kualoa ranch property (removed 3 pigs and 3 goats).

### **Maui and Moloka‘i**

Management of Maui District (Seven reserves, 21,493 acres) includes fence construction, ungulate control, human impact management, invasive weed control, rare plant and animal protection and monitoring, and public outreach. NARS staff also assisted East Moloka‘i Watershed Partnership (EMoWP) in conducting aerial shooting missions that removed 1,083 goats from the south slope of Moloka‘i, and assisted the USFWS by constructing feral pig traps at Kealia Pond NWR. Specific accomplishments within individual reserves include:

*‘Āhihi-Kīna‘u* (2,045 acres; recent lava flows, anchialine ponds, and nearshore marine ecosystem): Continued to partner with The Nature Conservancy (TNC) to implement the finalized management plan. Staff worked with the United States Army Corps of Engineers, its contractors, other DLNR divisions and federal agencies to complete an unexploded ordnance Remedial Investigation. Staff developed and began implementing a regular volunteer program; including partnering with Native Hawaiian Plant Society, Surfrider Foundation, and UH Maui for educational service trips. The two-year access restriction was maintained to prevent damage to resources due to recreational overuse, with staff deterring many incidents of illegal activity including poaching, theft, and entry into closed areas with DLNR's Division of Conservation and Resources Enforcement (DOCARE), the Maui Police Department, the Maui Citizens Patrol, and Reserve volunteers. To accommodate visitors in the open areas of the NAR, a pedestrian trail was developed, a contractor maintained portable toilets, daily opening of parking area and removed trash, and parking spots were paved to comply with the Americans with Disabilities Act. Phone lines, internet, and camera/alarm systems were installed in the on-site ranger station.



Native Hawaiian Plant Society volunteers assisted with invasive weed removal from ponds at ‘Āhihi-Kīna‘u

*Hanawi* (7,500 acres; ‘ōhi‘a wet and cloud forest, alpine grassland, and perennial streams): Staff maintained several field camps and landing zones, and over 10 miles of existing fences to keep pigs out of 2,000 acres in the Reserve’s upper elevations. Staff also constructed 1 mile of a new fence that will eventually enclose another 3,000 acres of habitat for T&E wildlife and plants in the central portion of the Reserve. Several miles of management trails were developed in the new fenced area for pig and weed control.



*Nakula* (1,420 acres; leeward montane koa/‘ōhi‘a forest and alpine shrublands): Staff removed 148 goats and 9 pigs from a recently completed 420 acre enclosure around the core remnant of native forest; the area is now ungulate free and natural vegetation recovery has been dramatic. Staff built 1.5 miles of fence along the Reserve’s Western boundary, and a contractor built another 3 miles of new fence to enclose another 2,400 acres of the NAR and adjacent Forest Reserve lands.

NARS Staff installing fencing in the alpine shublands of Nakula NAR.

*Kanaio* (876 acres; halapepe and lama dry forest): Staff continued to maintain and improve the newly constructed perimeter fence that encloses 1,600 acres of the Reserve and adjacent private lands. Special animal control permits were offered to the public to allow volunteer hunters to remove animals from inside the fence before staff control was implemented. Over 2,000 native trees were planted. Staff, volunteers and YCC controlled and performed weed management this year as follows: wattle control in 60 acres, Christmas berry control in 100 acres, bocconia (*Bocconia frutescens*) control in 506 acres.

*West Maui* (6,702 acres; pili grassland, mesic, wet, and cloud forest, montane bogs, and perennial streams): Kahakuloa section: Staff continued regular inspection trips to maintain 3.5 miles of lower boundary fence, and continued a snaring program inside the fenced area. One pig was removed. Pana‘ewa section: staff inspected and maintained boundary fence and snares with support from West Maui Mountains Watershed Partnership (WMMWP). Fences were extended into steep cliff areas to improve their effectiveness. Lihau: existing powerline service roads were improved to create a fire break outside the Reserve’s lower boundary. Two large wildfires have burned into the Reserve since 2005; the fire break will provide an opportunity to defend the Reserve in the event of another fire.

*Pu‘u Ali‘i* (1,330 acres; wet shrubland and forest with perennial streams): Staff continued to maintain 6.5 miles of fence that enclose the Reserve’s two management units. The on-going snaring program in the 450 acre upper management unit removed 16 pigs this year; that unit may now be animal free. The snaring program was extended to the 550 acre lower management unit.

*Oloku'i* (1,620 acres; mesic forest, wet shrubland and forest with perennial streams): Protected this remote and near-pristine area by aerial shooting and surveying conducted along the north shore of Moloka'i from Wailau to Waikolu Valleys and removed 773 feral ungulates (goats, pigs, and deer) during ten days of missions.



Oloku'i NAR sea cliffs

## **Hawai'i**

NARS Hawai'i Island staff continued management of eight reserves (94,953 acres) and participated in a number of cooperative partnerships. In addition, staff participated in the management of the Hawai'i Experimental Tropical Forest, Pu'u Wa'awa'a Forest Bird Sanctuary and Koai'a Corridor. Staff also assisted with fence materials procurement, contracts and job inspection for Mauna Kea fencing and hosted both YCC summer teams and two year-round Americorps interns. Ongoing management island-wide includes ungulate control through public hunting, staff implemented trapping and snaring, invasive weed and small animal control, and extensive rare plant protection and restoration (reintroducing over 5,000 plants of T&E and common native species). During FY 13, staff built over 4.5 miles of new fence to support the protection of native ecosystems.

For outreach and education, staff conducted a number of volunteer trips and developed and distributed outreach materials to several hundred people during special events such as Earth Day, Merrie Monarch Parade and the Hawai'i County Fair; hosted the Hawai'i Nei Art contest featuring native species artwork in cooperation with the Wailoa Art Center, the NPS and the Three Mountain Alliance (TMA); assisted with the coordination of the annual Pu'u Wa'awa'a "Run for the Dry Forest" event including 5 km and 10 km trails runs; and provided school children with educational opportunities both inside and outside the classroom. Annual Christmas Bird counts were held at Pu'u Maka'ala NAR. Additionally, the Hawai'i Island NARS program worked with the Youth Challenge Academy to introduce a natural resource component to their program. The NARS program conducted several field trips and presentations with school groups, community groups, including hunting groups, and elected officials.

Specific accomplishments within individual reserves include:

*Mauna Kea Ice Age* (3,894 acres; alpine community): Continued coordination with the Office of Mauna Kea Management on protection of the unique natural and cultural features on the summit; and reviewed permit requests to access the NAR for research and for educational opportunities. Staff maintained a 9.9 acre fenced unit for the protection of the endangered silversword and other rare alpine species; monitored six transects inside and outside of the fenced unit. NARS removed 25 sheep and assisted with court ordered sheep eradication efforts across Mauna Kea. The Hawai'i Island NARS Manager continued to participate as a member on the Mauna Kea

Management Board. The NARS program also consulted with the Kahu Ku Mauna, the cultural advisory committee for the Office of Mauna Kea Management, on management actions within the NAR and reviewed and commented on numerous environmental impact statements and environmental assessments on projects in the vicinity of the NAR.

*Pu'u O 'Umi* (10,142 acres; wet forest, montane bog, and perennial streams): Supported the Kohala Watershed Partnership's efforts to implement the Kohala Watershed Management Plan including maintaining existing fenced units and constructing 2 miles of fence in the remote portions of the Reserve. Staff researched additional methods to improve monitoring of Newell's Shearwater (T&E seabird) populations and have set up predator control measures around nesting sites. Staff also maintained the cabin and over 19 miles of trails. Staff controlled weeds removed 14 pigs in sensitive areas; and outplanted T&E plant species.

*Laupāhoehoe* (7,894 acres; wet forest with perennial streams): Continued to participate in the planning and implementation of the Hawai'i Experimental Tropical Forest (<http://www.hetf.us/>) including review and distribution of permits, monthly planning meetings, etc. Management included fence maintenance; rare plant monitoring and outplanting; removal of 17 pigs; invasive species control; and installation and collection of data for six vegetation monitoring plots; and installation of over 16 miles of transects for monitoring vegetation birds. NARS staff assisted with the establishment and on-going meetings of the Laupāhoehoe Advisory Council that will continue to assist with the development of a management plan for the area.

*Kahauale'a* (22,521 acres; wet forest with volcanic activity): Continued to monitor the eruptive activity at Kilauea by coordinating with the USGS Hawaiian Volcano Observatory, Hawai'i Civil Defense, DOCARE, and other agencies as the NAR remains closed to public use due to safety concerns. Staff added and maintained signage and issued special animal control permits were issued to hunters to access the safe areas of the NAR and assist with feral animal removal. A partnership with the neighboring landowner continues to assist with boundary fencing along a portion of the NAR near Volcano. Six monitoring plots were surveyed in each of these units.

*Kīpāhoehoe* (5,583 acres; mesic to wet forest): maintained fenced enclosure of 1,500 acres; conducted rare plant protection through seed collection and outplanting; controlled invasive species; and continued road and trail maintenance.

*Waiākea 1942 Flow* (640 acres; developing wet forest): Due to the remoteness and small size of this NAR and its establishment to act as a baseline for change, active management was not necessary in FY 13.

*Pu'u Maka'ala* (18,730 acres; wet forest): Ungulate management included upgrading 2 miles of fencing and surveying 7.5 ungulate transects. NARS cooperated with TMA in conducting T&E plant outplanting including the endangered silversword, invasive weed control; and supervised volunteers. Staff analyzed nine miles of monitoring transects; and conducted multiple outreach trips including hosting the annual Christmas Bird counts. NARS worked on finalizing the Pu'u Maka'ala NAR management plan and Final Environmental Assessment. Cooperation with the Youth Challenge Academy, which currently occupies the Kūlani facility, is on-going. NARS assisted to integrate a natural resource management component into their program. Coordination

and discussions with the State Department of Public Safety have been on-going regarding coordination for the reopening of Kūlani Correctional Facility.



*Manukā* (25,550 acres; coastal to subalpine forest): Controlled ungulates by monitoring a radio collared sheep and goat and removing 3 sheep and 3 goats and feral pigs. Staff completed construction of 1.75 miles of fence to protect the top 1,000 acre portion of the NAR from ungulates. Also, monitored fenced units in the coastal area for native coastal vegetation recovery and controlled invasive fountain grass in the lower 14,000 acres of the NAR. Staff cleaned tons of trash from the coastal areas and illegal dumping sites including one event hosted in partnership with the Hawai‘i Wildlife Fund. NARS also conducted rare plant outplanting and maintained existing fence units, roads, and trails. Staff updated the draft Manukā NAR management plan; and received approval from the BLNR to proceed with construction of boundary fence with secured CIP funds.

*Other Areas:* The Hawai‘i Island NARS Program assisted with management of other protected areas outside Reserves. Activities included invasive weed control, fire break maintenance, rare species outplanting, and the removal of feral ungulates from Pu‘u Wa‘awa‘a (418 feral pigs removed). Staff also worked at the Koai‘a Corridor doing restoration planting (1,600 common trees and 63 rare species planted), weed control and installation of walkovers for public access. NARS partnered with the DOFAW Forestry staff to control sheep on Mauna Kea for Palila restoration and compliance with a court order. Additionally, NARS staff assisted the TMA with blackberry control on Kamehameha Schools land. The NARS program is assisting with the Hawai‘i Island Axis Deer Working Group and has committed staff time and resources to ensuring the successful control of this threat.

#### **1.4 RARE PLANT PROGRAM**

The focus of the NARS support of the Rare Plant Program was providing matching funds for projects supported by Section 6 of the federal Endangered Species Act. Projects include habitat protection and enhancement within the NARS on the Hawai‘i island; support for the propagation and storage efforts of the six Rare Plant Facilities: the four mid-elevation nurseries of Volcano (Hawai‘i), Pahole (O‘ahu), Olinda (Maui) and Kōke‘e (Kaua‘i), plus the Lyon Arboretum Micropropagation Laboratory and Lyon Seed Conservation Laboratory (O‘ahu); and the statewide Plant Extinction Prevention Program (PEP).

**The Statewide Rare Plant Database:** Detailed demographic information provided by the PEP program is serving as a template for data entry for a statewide information program. The rare plant facilities continue to improve upon their existing databases and standardize the data collected as they progress towards the goal of state-wide unification. The database will expand to

include data from members of the Hawai‘i Rare Plant Restoration Group as funds become available to support a web-based data entry [www.hrprg.org](http://www.hrprg.org).

**The Hawaiian Rare Plant Facilities** are propagation and storage facilities for rare native Hawaiian plant taxa which function as part of a state-wide network. They work to prevent extinction by 1) propagating and increasing plant numbers for reintroduction into natural habitat, and 2) storing species for which there is no adequately protected habitat and to safeguard against extinction for those taxa which have very few wild individuals remaining. These facilities work closely with other public and private cooperators across the state and collaborate with federal, state and private land managers to replant species into appropriate habitats.

- 192 rare plant taxa were propagated for outplanting this FY, with 4,080 individuals outplanted back into natural habitats.
- Lyon Arboretum Micropropagation Laboratory received 137 separate collections representing 72 species. 43 (60%) are from species federally listed as T&E, while 10 (13%) came from Species of Concern. The total number of plants that the lab currently has in inventory is 21,091.
- The Lyon Seed Conservation Laboratory accessioned 254 collections, representing 580 individual seed lots, and 138 taxa. Of these individual seed lots, 451 (78%) were from T&E taxa, 8 (1%) were from taxa with Candidate status, and 48 (8%) are from taxa considered Species of Concern. 1,061,844 seeds were deposited into the seed bank.

**The Plant Extinction Prevention (PEP) Program** leads the largest statewide T&E plant protection effort in Hawai‘i, and is supported with federal, state, and private funding. To address the extinction crisis and focus efforts on the most critically rare Hawaiian plants, the PEP Program implements recovery actions for species that number fewer than 50 individuals remaining in their natural habitats. These are coined “PEP” species or taxa. The PEP Program (<http://www.pepphi.org>) focuses efforts on preventing the extinction of its 234 target species.

**Plant Extinction Prevention Program FY 13 Highlights**

PEP Staffing	<ul style="list-style-type: none"> <li>• 4 FTE island coordinators on Kaua‘i, O‘ahu, Maui, and Hawai‘i</li> <li>• 0.50 FTE island coordinator on Moloka‘i</li> <li>• 1 FTE statewide coordinator</li> <li>• 1 FTE technician on Maui</li> <li>• 3 part-time technicians on O‘ahu</li> <li>• 1 part-time technician on Moloka‘i</li> </ul>
<ul style="list-style-type: none"> <li>• Implemented actions to protect 159 T&amp;E species and 1 Proposed Endangered species.</li> <li>• Population monitoring implemented for 106 species, placing 70 of these into <i>ex situ</i> cultivation at a cooperating Rare Plan Facility.</li> <li>• Surveys were conducted for 44 PEP species.</li> <li>• Managed threats for 64 PEP species to protect wild plants. Management included weed control, fence construction/ maintenance, rat trapping, and protecting fruits from invertebrate and rodent pests.</li> <li>• Reintroduced 22 PEP species totaling 1,020 plants into protected habitat to establish new populations.</li> <li>• Worked with partners to create a Guam PEP Program to protect rare plant species.</li> </ul>	



*Pritchardia viscosa*, 1 of 4 wild plants known on Kauai

### **1.5 NATIVE INVERTEBRATE PROGRAM (NIP)**

The objective of the NIP is to expand the knowledge and resources available to effectively direct resource management, monitoring, research, conservation, and policy relating to federally listed T&E Hawaiian invertebrate species, as well as other rare and unique native invertebrate species. Conservation and resource management have not historically focused on invertebrates, despite the fact that they constitute the vast majority of the wildlife in the State. This is unfortunate considering that our native insects, spiders, snails, and crustaceans showcase astounding biological diversity and unique ecological adaptations, as well as provide untold educational and research opportunities.

Hawaiian ecosystems are dependent upon the ecological services completed by a diverse assemblage of native invertebrate species. Hawaiian tree and plant species could not exist without pollination and nutrient cycling which native invertebrate communities provide, and native invertebrates are essential food resources for native bird and bat populations. Consequently, conservation and management efforts which protect native invertebrate communities inherently protect the native plants and animals which depend upon them.

The need to effectively manage native invertebrates on state owned and managed lands is great. To date, USFWS has conferred T&E species status on a variety of unique native Hawaiian invertebrates at risk of extinction, including 1 moth, 1 wolf spider, 40 tree snails, 1 amphipod, 11 fruit flies, and 5 damselflies. Additional listings are imminent, for example, USFWS determined that 7 species of Hawaiian yellow-faced bees are warranted for listing. The NIP program provides guidance to DLNR regarding management of invertebrates on State lands, and is also working actively with federal agencies and private landowners to address management needs.

Threats to native invertebrates include, but are not limited to, habitat destruction and alteration, loss of native host plants, and the invasion and establishment of non-native species. The NIP

collaborates frequently with DLNR staff and partner agencies to address the multitude of issues affecting native invertebrate conservation. Addressing the ecological impacts of invasive insect pest species is also a high priority of the program.

### **Native Invertebrate Program (NIP) Staff**

The NIP supports 2 full-time positions. Despite limited personnel, NIP is growing steadily, supporting new projects, facilitating partnerships with other State and Federal agencies, and non-governmental organizations, and collaborating to obtain funds to address specific research, management and conservation needs. Staff provides technical support and expertise for projects, plans, and permits, relating to native invertebrate species as well as seeks State and Federal funds to support monitoring, research, conservation and management. Supported with funding from federal grants matched with State special funds, a Snail Extinction Prevention (SEP) Program Specialist is developing a program to stabilize populations of rare snails.

### **Native Invertebrate Program (NIP) Funding:**

- USDA-FS grants (with DOFAW Forest Health program): 1) Survey/monitor myoporum thrips (*Klambothrips myopori*) infestation on Hawai‘i Island. FY 11 - FY 13 funds total \$128,647; FY 13 \$41,000 2) Census/monitor long-term health of wiliwili (*Erythrina sandwicensis*) populations on O‘ahu, Maui and Hawai‘i islands. FY 12 - FY 14 funds total \$132,000.00; FY 13 \$35,000. Monitoring completed with UH Dept. of Plant and Environmental Protection Sciences.
- Department of Defense grants: 1) Completed grant for “Assessing abundance and distribution of 20 yellow-faced bee species on O‘ahu and Hawai‘i Island.” Funds totaled \$109,123 2) “Developing captive propagation methodologies for 5 native Hawaiian yellow-faced bee species: a novel approach to endangered species mitigation.” Funds total \$87,903.00. Project will begin in 2014.
- Hawaii Invasive Species Council (HISC) grant for “Development of naio thrips early detection and rapid response plans for the islands of Kauai, Maui and Moloka‘i.” Funds total \$6,215.00.
- USFWS funding to continue SEP program support and to continue development of the statewide native invertebrate database. FY 13 funds total \$75,000.

NIP staff discovered a new native yellow-faced bee species on O‘ahu: *Hylaeus mamo* during surveys performed under a Department of Defense grant.



### **Native Invertebrate Program (NIP) Program Activities:**

- Coordinated DLNR response to outbreak of native koa moths, and resulting koa defoliation, on Hawai‘i Island.
- Worked with USFWS on T&E species issues including guidance for landowners on

management, take and mitigation of Blackburn's sphinx moth and penalties for unlawful take of *Achatinella* snails at Mt. Ka'ala by Hawaiian Electric Company

- Conducted surveys for yellow-crazy ants (*Anoplolepis gracilipes*) in collaboration with USFWS at Kaena Point NAR, to determine extent of infestation.
- Reviewed and Issued 32 Native Invertebrate Scientific Research and Collecting permits.
- Continued to develop a Myoporum thrips early detection and rapid response plan for O'ahu, with HDOA and OISC and Army Natural Resources Program.
- Organized invertebrate bioblitz (rapid biological assessment) in Ewa Forest Reserve.
- Participated in National Moth Week by hosting a light-trapping event in Ewa Forest Reserve: <http://nationalmothweek.org/2012/08/17/guest-post-cynthia-king-about-nmw-event-oahu-hawaii/>
- Participated in wekiu bug surveys on Mauna Kea with UH Hilo and Office of Mauna Kea management staff.
- Provided funding to UH Manoa for four projects: support of digitization of the UH Insect Museum collections for the Statewide Invertebrate Database; research on effects of rat baiting/removal on native ecosystems in the Waianae mountains; research on threats to Kamehameha butterfly populations; and research on invasive moss control in Mt Ka'ala NAR and impacts to rare endemic land snails.
- Continued development and implementation of a statewide Invertebrate Conservation Strategy with the objective of establishing cooperative relationships with relevant stakeholders at agencies, institutions, and organizations involved.
- Maintained NIP website to provide project and contact information to the public:
- Represented the NIP program at the Office of Mauna Kea Management Wekiu Bug Working Group, Hawai'i Biological Control Working Group, and International Symposium on Biological Control of Weeds.

Snail Extinction Prevention Program staff moved a population of endangered *Achatinella concavospira*, impacted by extreme rat predation, to protected habitat within the Honouliuli Forest Reserve.



- Assisted with the construction of a predator proof enclosure structure, to protect rare snails, at the summit of Poamoho in the Koolau Mountains on O'ahu and partnered with the OANRP to monitor and maintain four predator proof enclosures, harboring rare snails, in the Waianae Mountains.
- Protected T&E *Achatinella* tree snail species by controlling rats around populations in the Northern Koolau Mountains, and assisting NARS staff with rat control in the Pahole and Mt. Ka'ala NARs.
- Completed rare snail surveys including: Koolau and Waianae Mountains in collaboration with the OANRP, NARS, and the Koolau Mountains Watershed Partnership; land snail

diversity surveys on O‘ahu, Moloka‘i and Maui with UH researchers; and T&E snail survey in Pu‘u Kukui Watershed Preserve on Maui.

- Facilitated the first two annual SEP Program Advisory Group meetings.
- Attended and presented paper and/or poster presentations:
  - Hawai‘i Conservation Conference, Honolulu, HI. 2012. Oral presentation: *Update on the development of a native invertebrate database: a new resource for managers, researchers, planners and the public.*
  - Hawai‘i Conservation Conference, Honolulu, HI. 2013. Oral presentation: *Introduction to the snail extinction prevention program.*
  - Nahelehele Dry Forest Symposium, Kailua-Kona, HI. 2013. Oral presentation: *Myoporum thrips in Hawaii: an update on monitoring and management* and Poster: *Mysterious migrations of myoporum thrips.*

## **1.6 FINANCIAL REPORT**

NARS is financially supported partly through the General Fund under program LNR-407 (see Table A). In FY 13, general fund expenditures were \$639,202.25 in personnel costs and \$16,259.27 in operational costs, totaling \$655,461.52. This funding was supplemented by federal grants on a project-by-project basis and by state special funding from NARF, which is reported on pages 33 and 48.

## **1.7 PLANS AND MANAGEMENT OBJECTIVES FOR FY 14**

Governor Abercrombie’s *A New Day in Hawai‘i* plan guides the DLNR to ensure *mauka* watersheds are fully functioning so fresh water resources can be used and enjoyed by the people of Hawai‘i in perpetuity. The well-established programs of the NARF largely implement this priority initiative of the administration. Future plans for the watershed initiative are included in the proposed LNR 407 biennium budget request. Approximately \$11 million per year is required reach the Administration’s goals of doubling the watershed acres protected by 2021.

NARS staff will continue to coordinate the watershed initiative and take the lead on many of the projects. Plans and management objectives include continued work on pending fencing projects; continued collaboration with watershed partnerships to cooperatively manage areas on a landscape level; continued removal of feral animals; continued control of habitat-modifying invasive species; continued restoration of rare plant species, update of individual reserve management plans, and the implementation of the BLNR approved strategic plan.

### **Specific Plans and Objectives by Branch (FY 14):**

Kaua‘i:

- Continue forest restoration within the Kuia fence and conduct weed control and weed distribution surveys.
- Enhance the Alakai boardwalk trail working with the Na Ala Hele program.
- Implement Hono O Na Pali NAR management including construction of fencing and weatherports for remote field operations, and predator control.
- Continue implementation of the successful T&E plant restoration program.

- Support activities of the KWA.

#### O‘ahu:

- Construct fences at Poamoho and Kaluanui.
- Continue ungulate removal from fenced units within Pahole and Ka‘ala NARs.
- Monitor and remove rodent predators within and adjacent to the Ka‘ena Point Predator Proof Fence, and monitor seabird population recovery.
- Continue implementing new herbicide efficacy trials, programmatic weed control and weed seed viability trials.
- Complete addition of Poamoho and Kaluanui to the NARS.
- Continue to work with OANRP in the Mākua and O‘ahu training area mitigation process.
- Continue active participation in the DLNR Ka‘ena Point Stewardship Group.

#### Maui:

- Protect Hanawi NAR through fence construction, maintenance, and cyclic replacement, ungulate and weed control, and rare species monitoring, with East Maui Watershed Partnership (EMWP) and Maui Forest Bird Recovery Project.
- Complete ungulate removal from Kanaio NAR and initiate management plan update.
- Conduct boundary fence inspection and maintenance at Kahakuloa NAR and removal of animals, with the West Maui Mountains Watershed Partnership (WMMWP).
- Continue ungulate removal from inside the fenced mauka unit in Pu‘u Ali‘i NAR.
- Continue aerial shooting of large feral animals (particularly goat) populations on the north shore of Moloka‘i.
- Continue implementation of Ahihi-Kinau access restrictions, conduct monitoring surveys, and implement the management plan with the Ahihi-Kinau Advisory Group and TNC.

#### Hawai‘i:

- Finalize the management plan for Manukā NAR, and implement CIP funded construction of the Manukā boundary fence.
- Continue cooperation with USGS Hawaiian Volcano Observatory to monitor the current lava flow within Kahauale‘a NAR.
- Implement the Pu‘u Maka‘ala NAR management plan and continue work with the TMA and other state departments to advance management goals including invasive species control, rare plant restoration, and protection of native habitat.
- Work with the Kohala Watershed Partnership to implement the management plan and the Lahomene CIP watershed protection project in the Pu‘u O Umi NAR.
- Continue participation in the Hawai‘i Experimental Tropical Forest, particularly as it overlaps with Laupāhoehoe NAR and continue developing a management plan with input from the Laupāhoehoe Advisory Council.
- Continue collaboration with the Office of Mauna Kea Management to address management needs.
- Continue other active programs (outreach and education, rare plant restoration).

## **2. NATURAL AREA PARTNERSHIP PROGRAM (NAPP)**

### **2.1 DESCRIPTION OF ACTIVITIES AND ACCOMPLISHMENTS**

This innovative Program, established by the Legislature in 1991 through Act 326, provides state-matching funds on a 2:1 basis with private funds for the management of natural resources on private lands permanently dedicated to conservation. NAPP complements the existing NARS by providing long-term protection, financial support and management to protect, restore and enhance unique natural resources on private lands. NARS staff administers NAPP, although the private applicant actually carries out all on-the-ground activities. Six-year, long-range management plans provide funding and direction for each NAPP Preserve. Since 1993, a portion of the Conveyance Tax, which is levied each time real estate property in Hawai'i is bought or sold, has funded the Program.

#### **PU'U KUKUI WATERSHED PRESERVE**

**Landowner: Maui Land & Pineapple Co.**

**Managing Partner: Maui Land & Pineapple Co.**

**Entered NAPP: FY 94; 8,304 acres**

Accomplishments include maintaining 48 percent of the preserve as ungulate-free for five or more years, continuing ungulate control where ungulates remain (16 pigs were removed by public hunters, 16 by staff), installing 0.98 miles of 8 ft fencing, inspecting and maintaining 7.8 miles of existing fencing, monitoring of alien threats, invasive weed control, and rare species protection and restoration out plantings in cooperation with the PEP program. PKW represented WMMWP in various capacities to support funding and the Watershed Initiative.

FY 14 Plans and Objectives: Control and monitor weeds, install an additional 0.5 mile of eight foot fences for axis deer exclusion, inspect and maintain fences annually, continue public permit hunting program, continue to provide leadership in WMMWP, offer monthly community volunteer trips, support for approved research projects, and increase community outreach.

#### **KĀNEPU'U PRESERVE**

**Landowner: Castle and Cooke Resorts, LLC**

**Managing Partner: The Nature Conservancy (TNC)**

**Entered NAPP: FY 92; 590 acres**

TNC subwards with Tri-Isle RC&D Council, Inc. to accomplish essential stewardship activities in the Preserve. Management was conducted primarily by a subcontractor, including animal and invasive plant control, fire prevention, and occasional restoration and research support. TNC staff provides routine oversight and assist with management activities. Accomplishments include: 1) 49 contractor and volunteer hunts conducted with 61 axis deer removed; 2) bi-monthly fence maintenance, repair and inspections were completed; 3) .70 miles of new fence was installed; 4) a new 18 acre fenced subunit was created to protect T&E plant species and facilitate deer removal; 5) 83 acres within the Preserve are now deer free; 6) intensive weed removal inside and around two small enclosures - weeds removed include Christmas berry,

lantana, corky passion vine, and other species; and 7) several miles of fire breaks were mowed and maintained to prevent potential fire damage.

FY 14 Plans and Objectives: Continue ungulate control, fence maintenance, weed control and fire control.

### **KAPUNAKEA PRESERVE**

**Landowner: Kā'anapali Land Management Corp.**

**Managing Partner TNC**

**Entered NAPP: FY 92; 1,264 acres**

TNC subawards to Tri-Isle RC&D Council, Inc. to accomplish essential stewardship activities in the Preserve through the WMMWP. The WMMWP conducted animal control and monitoring, conducted an annual aerial weed survey, removed multiple species of invasive habitat-modifying weeds, maintained infrastructure, and provided occasional access to researchers.

Accomplishments were: 1) Fifteen pigs were removed from lower, less native habitat; 2) Initiated construction of the Honokōwai Valley fence 3) Monitored ungulate activity transects semiannually; 4) Inspected and improved boundary fences monthly or bimonthly; 5) Conducted one aerial survey to locate strawberry guava outliers and to monitor any pig activity; 6) Removed 340 strawberry guava 25.1 acres and 83 *Tibouchina herbacea*, and 24 *Clidemia hirta* (1.76 acres); and 7) TNC served on the WMMWP Executive Committee and supported funding and watershed activities.

FY 14 Plans and Objectives: Continue to carry out ungulate control, fence maintenance, weed control, threat monitoring, and other routine management activities.

### **PELEKUNU PRESERVE**

**Landowner: TNC**

**Managing Partner: TNC**

**Entered NAPP: FY 92; 5,759 acres**

Protection of the watershed by reducing ungulate damage, reducing the spread of non-native plants, and monitoring native stream life for changes in species densities are the primary management activities. Ungulate control in Pelekunu consisted of supporting NARS aerial shooting on the north shore of Moloka'i. TNC assisted with mapping, spotting and flight-following services for all north shore missions. In its first outplanting along the north slope, PEP began a small scale trial to outplant fourteen critically rare alula (*Brighamia rockii*) and seven critically rare naupaka (*Scaevola coriacea*). TNC also collaborated with DOFAW to control the invasive African tulip in Wailau Valley to leverage support and eliminate all occurrences of the species in both Pelekunu and neighboring Wailau by 2015.

FY 14 Plans and Objectives: Monitor the streams with local community members, support NARS aerial shooting, ground hunts, and African tulip control. Community outreach efforts will also continue with public lectures, preserve overlook hikes, and summer youth programs.

## **KAMAKOU PRESERVE**

**Landowner: Moloka'i Ranch, Ltd.**

**Managing Partner: TNC**

**Entered NAPP: FY 95; 2,774 acres**

The primary management focus is to prevent degradation of the native forest by reducing feral ungulate damage, limiting the spread of non-native habitat-modifying plants and preventing wildfire. TNC contracted Pono Pacific to conduct systematic animal and weed control “sweeps” of priority areas. Monitoring indicates wet forest areas remain in very good condition, though animal activity continues to impact lower portions of the Preserve. The PEP program continues extinction prevention measures for six critically rare plant species and constructed a fence with TNC to protect some of the last remaining *Melicope mucronulata* from animal browsing. Funding for a 1.7 mile fence to protect at least three critically rare species and 800 acres of the Preserve’s most intact wet and mesic forest has been secured. TNC staff provided logistical support for several research projects. Public outreach continued to be important both on and off-site. Kamakou Preserve celebrated its 30<sup>th</sup> anniversary at the April Moloka'i Earth Day event. A video commemorating the anniversary continues to be shown on the Akaku Public TV station. The Moloka'i Fire Task Force was instrumental in the improvement of the main roads for fire access. DOFAW provided the heavy equipment, while TNC provided fuel, gravel and one major repair. The road is in the best shape in 30 years and will greatly aid with access and providing an escape route should there be a wildland fire in the adjacent south slope areas.

FY 14 Plans and Objectives: Continue targeted invasive species control sweeps in upper areas with known weed or animal populations or “hotspots” and conduct spot hunts targeting animal herds lower down. Complete the 1.7 mile Kamakou fence extension. Other activities will include supporting researchers and conducting community outreach.

## **MO'OMOMI PRESERVE**

**Landowner: TNC**

**Managing Partner: TNC**

**Entered NAP Program: FY 95; 921 acres**

TNC continues to successfully implement predator control and weed removal that promotes “passive” restoration of coastal habitat. Since beginning weed removal in the mid 90's, TNC has successfully removed over 9 acres of kiawe and restored over 7 acres of coastal habitat for native plants and birds. Native plant diversity and rare species continue to increase in former kiawe removal plots. Wedge tailed shearwaters continue to colonize the preserve with 709 nests recorded in FY 13, up 149 nests from FY 12. TNC continues to assist DOFAW with the Maui Nui Seabird Recovery Project and approximately 150 native wedge-tailed shearwaters were banded, with an additional 39 previously-banded birds relocated. Observations that axis deer are negatively impacting native vegetation and crushing shearwater nests have led TNC to explore a deer and predator-proof fence for the coastal strand. TNC is initiating the permitting process and locating funds for the proposed 1.6 mile, 7 foot high fence. Community outreach programs included preserve hikes, a fishing pass key system, and off-site activities.

FY 14 Plans and Objectives: Continue removing kiawe, predators, and monitor the wedge-tailed shearwaters' nesting colony. The deer and predator-proof fencing is expected to begin in the latter part of the FY 14. Community outreach and support of research projects will also continue.

### **WAIKAMOI PRESERVE**

**Landowner: Haleakala Ranch Company**

**Managing Partner: TNC**

**Entered NAP Program: FY 95; 5,230 acres**

TNC subawards to Tri-Isle RC&D Council, Inc. to accomplish stewardship activities through the East Maui Watershed Partnership (EMWP). The EMWP conducted animal control and monitoring, removed invasive Himalayan ginger and *Pinus* spp., maintained infrastructure, and provided occasional access to researchers. Accomplishments included: 1) All fences were checked quarterly or bi-monthly; 2) 31 hunts were conducted; 3) Minimal ungulate sign was detected in over 1,572 miles scouted on the ground during routine activities; 4) One pig was removed; 5) 157 acres were surveyed and treated for Himalayan ginger; 6) 0.72 acres of ginger was treated; 7) 2,767 pines that were invading were removed; 8) Ungulate monitoring transects showed 0% sign; 9) 20 species of rare plants were documented in new locations; and 10) 7 arthropod and 3 botanical research projects were conducted.

FY 14 Plans and Objectives: Continue to minimize all ungulate damage through regular control efforts and rigorous fence inspections, and controlling habitat-modifying weeds.

### **KA'Ū PRESERVE**

**Landowner: TNC**

**Managing Partner: TNC**

**Entered NAP Program: FY 07; 3,511 acres**

FY 13 marked the 4<sup>th</sup> year of ungulate-free status within the Preserve's 1,200 acre fenced unit. Bi-weekly fence checks continued, and vog-damaged fences were replaced. TNC staff worked to enhance public hunting in the adjacent Ka'ū Forest Reserve by coordinating access through the preserve, maintaining roads, and working with neighboring landowners and DOFAW to secure permanent access routes along the lower forest boundary, with 2.5 miles surveyed to date. TNC supported axis deer eradication by providing equipment and field assistance for successful control efforts in Ka'ū. In total, 71 acres of high priority weeds were removed at Kaiholena through contract and staff efforts, Himalayan ginger was monitored and controlled within 3 acres at Kāhilipali, and 5.5 acres at Keaīwa. Monitoring and seed collection of rare species continued within the fence unit, which produced 34 *Pritchardia lanigera* volunteer seedlings.

Community outreach and environmental education programs continued with contributed volunteer work hours totaling 512 hours. In collaboration with DOFAW, TNC staff co-hosted a booth and donated a prize for the annual hunting tournament, a hunter access talk story pulehu, and a week-long Ka'ū coastline hike with the Imi Pono No Ka 'Aina youth program. TNC also help organize visits to the Ka'ū Forest Reserve to increase understanding of DOFAW's management plan, and Mayor Kenoi and Councilwoman Ford were among dozens of stakeholders in the Ka'ū community included.

FY 14 Plans and Objectives: Continue to maintain and upgrade the fence, monitor for and remove ingress animals. Strategies to enhance hunter access to the Ka‘ū forest will include assisting with survey of the remaining 2.5 miles of forest boundary. The Himalayan ginger population in the Kī‘olokū and Keaīwa units will be monitored and eliminated, and high priority weeds within the Kaiholena unit will be controlled. Alignment surveys will be conducted for a fence that will tie into the existing Kaiholena unit, effectively incorporating it into DOFAW’s 12,000-acre upper Ka‘ū Forest Reserve management area. TNC will continue to provide logistical support to the Axis deer eradication effort in south Hawai‘i. Efforts to build community understanding and support for the preservation of Ka‘ū’s native forests, and to enlist volunteer assistance for preserve management will continue with outreach activities.

## **2.2 FINANCIAL REPORT**

NAPP is supported primarily through NARF. In FY 13, state expenditures were \$605,220.32. As NAPP provides matching funds on a 2:1 basis, these state funds were matched by at least \$302,610 in private funds. In actuality, NAPP participants typically provide additional matching dollars for conservation, through additional private funds or through acquisition of federal grants.

## **2.3 PLANS AND MANAGEMENT OBJECTIVES FOR THE NEXT FISCAL YEAR**

NAPP preserve management activities in FY 14 will be guided by completed, BLNR-approved management plans. Plan implementation will focus on eliminating or controlling the spread of non-native plants and animals that have a detrimental effect on native ecosystems. Other management considerations will include T&E species protection, monitoring, research, public education and generating community support. Goals for individual preserves are discussed above.

## **3. COMPLIANCE WITH CHAPTER 42F, HRS, REQUIREMENTS FOR GRANTS AND SUBSIDIES**

Under NARS, no grants or subsidies were issued pursuant to Chapter 42F, HRS. Due to legislative amendments, Chapter 42F, HRS, is no longer applicable to the types of grants issued under NAPP. All grants awarded as part of NAPP are compliant with the State Procurement Code, Chapter 103D, HRS.

## **4. STATUS OF PUBLIC HUNTING OPPORTUNITIES**

Under NARS Management Policies, strategies to reduce populations of non-native animals to the lowest possible level are to be employed. Public hunting continues to be the primary control option in many areas within NARS, although hunting is not managed on a sustained-yield basis. Animal control methods (including fencing, trapping, staff hunting, snaring, and aerial shooting) are used as needed in specified areas where public hunting is not able to reduce population/activity to the lowest possible level.

In NAPP Preserves, the public hunting opportunities vary.

- Mo‘omomi Preserve does not have a public hunting program due to safety concerns and limited resources for administration and enforcement. If studies indicate that deer control is needed, TNC will pursue management in the best interest of the resources.

- Kamakou Preserve is open for public hunting when it is compatible with regulations of the adjoining Pu‘u Ali‘i NAR. At this time, the NAR and Preserve are open 365 days/year, with no bag limit. During extreme fire hazard, unsafe road conditions, or herbicide spraying in accessible areas, portions or all of the Preserve may be closed.
- Pu‘u Kukui Preserve is open to public hunters by permit 365 days/year, with no bag limit.
- Waikamoi Preserve’s conservation easement allows ranch employees to hunt. Public hunters are permitted to hunt in portions of the Preserve when it does not interfere with management, guided hikes, and ranch employee hunting. The management goal is to remove all ungulates; approximately 50,000 acres of public hunting lands are available below the Preserve to meet public hunting needs.
- Kapunakea Preserve’s conservation easement requires that there be no unaccompanied public hunting. The Preserve is closed to hunting with dogs due to snaring. However, TNC staff may accompany public hunters without dogs upon request when hunting does not interfere with management and can be done at the same time as scheduled work trips.
- On Lana‘i, TNC used volunteer hunts as a method to remove remnant deer from the fence enclosure units.
- On Hawai‘i Island, TNC will continue to use volunteer hunters to reduce animal numbers within the Ka‘ū Preserve.

NARS, NAPP and Watershed Partnership staff work closely with DOFAW’s Access and Acquisitions Program and DOFAW Wildlife Program to continue to enhance opportunities for public hunting and improve access to appropriate public and private hunting lands. This is accomplished through a variety of means, including securing agreements through inter-departmental transfers of management authorities (“set-asides”), purchase of fee title or conservation easements, leases, cooperative agreements, license agreements and other agreements with public and private landowners.

## **5. OTHER PROJECTS FUNDED BY THE NARF PURSUANT TO § 247-7, HRS: WATERSHED PARTNERSHIPS & HAWAI‘I YOUTH CONSERVATION CORPS**

### **5.1 WATERSHED PARTNERSHIP PROGRAM**

Recent increases in funding from the Legislature for Governor Abercrombie’s “Rain Follows the Forest” watershed protection plan have been used to plant trees, accelerate the completion of fences, begin new fence projects and manage the invasive weeds and animals that threaten our watershed forests. In FY 13, \$2.5 million was available from the NARF, an increase of \$900,000 over FY 12. Projects awarded state funds leveraged over \$4 million in 2013 from non-state sources, achieving more than a 2:1 ratio of non-State to State funding. State funds are crucial to this ability to leverage federal, county, and private monies.

In FY 14, \$3.5 million was allocated in general funds. The Governor’s restriction resulted in 5% of those funds being withheld. In addition, the legislature created 11 new positions to be paid from these general funds. The remainder, a total of \$3,035,562 was awarded through a Request for Proposals.

Watershed partnerships have teamed with DOFAW and island Invasive Species Committees to move forward with implementing the watershed initiative. Watershed Partnerships are successful public-private ventures responsible for protecting over 2 million acres of the most important watershed lands on all 6 main Hawaiian Islands. These forests form the living sponge that allows billions of gallons of fresh water to soak into the ground instead of running off directly into the ocean, which would carry sediment and pollutants onto our beaches and reefs. Along with preventing erosion, forests slowly releases the water to refill our aquifers, providing fresh water supplies upon which all residents, tourists, agriculture and industry depends.

In 2001, the Hawaii State Legislature authorized the use of the NARF to support projects undertaken in accordance with watershed management plans negotiated with private landowners. This allowed partnerships and other organizations to pursue other federal, county, and private funds by using these State funds as leverage. FY 14 marked the first year that general funds were allocated.

The benefits of managing our most mauka lands as partnerships are many:

- threats are addressed more economically across landownership boundaries
- limited State funds are leveraged to obtain federal, county and private funds
- resources and expertise are pooled to reduce redundancy
- private landowners increase their capacity and desire to protect their forests
- other ecosystem services are provided such as cultural resources, recreation, education, native species preservation, and rural jobs

There are eleven partnerships with over 70 private landowners and 24 public agencies currently involved. All partnerships have management plans approved by their members which guide their actions, providing clear objectives and measurable outcomes.

The **main threats to watershed health** are:

- **Destructive Animals:** Non-native feral ungulates like pigs, goats, sheep, mouflon, cattle and deer trample and kill plants, tear up the ground with their hooves, & increase erosion.
- **Destructive Weeds:** Habitat-modifying invasive species replace native species and contribute to erosion.

The **most important management actions** include:

- Fencing priority watershed areas
- Removing ungulates
- Controlling invasive species
- Monitoring forest health
- Outplanting, restoration and rare species management
- Education and community outreach.

**Highlights of Watershed Partnership FY 13 Accomplishments and FY 14 Objectives**

FY 14 general funds have recently been awarded and contracts are scheduled to be completed by January 2014. Appendix B lists the awarded FY 14 projects. Reports below indicate an interim status of expenditures and work still in progress utilizing 2012 and 2013 grant funds only.

## **KAUA'I**

***Kaua'i Watershed Alliance (KWA)*** - 144,004 total acres

FY 12 State Watershed Partnership Funds:	\$179,998
FY 13 State Watershed Partnership Funds:	\$299,997
FY 14 State Watershed Partnership Funds:	\$295,000
Total Annual Watershed Partnership Budget:	\$820,000

### Recent Accomplishments:

- Inspected and maintained 6.2 miles of fence, performed 42 minor repairs
- Removed 5 pigs from within fenced units
- Removed the last 3 known goats from within the Alakai Unit (2,000 acres)
- Maintained ungulate free status of the Kanaele fenced unit
- Continued monitoring 13 remote cameras within fenced units for invasive animals
- Conducted aerial surveys using Forward Looking Infrared cameras for animals
- Designed and began construction of a "Super Trap" for areas with large numbers of animals to enable capture of more than one animal at a time
- Treated invasive weeds such as strawberry guava and kahili ginger over 75 acres
- Treated 4,680 Australian Tree Ferns using a helicopter and precision applicator
- Completed processing of high resolution imagery of 1,950 acres to identify Australian Tree Ferns to be controlled
- Surveyed proposed fencelines to protect 2,200 additional acres of priority watershed
- Monitored 6 vegetation transects which continue to show recovery of vegetation within fenced areas and increased degradation of areas outside of fences

### FY 13 Actions (on-going):

The KWA is currently inspecting and maintaining 6.2 miles of fence and controlling feral pigs and goats on 9,258 acres. They are monitoring 3.1 miles of transects for invasive weeds and feral animals as well as controlling priority weeds on 510 acres. Using high resolution aerial photography 1300 acres are being surveyed for the invasive Australian tree fern. Compliance documents for a new watershed fence in the Alakai Preserve are being prepared and construction specifications are being finalized for an Invitation for Bids. Funds are also being applied toward an integrated pest management strategy for Himalayan ginger, another highly invasive weed that threatens watershed forests statewide.

### FY 14 Goals (contracting under-way):

Partnership staff will remove and survey ungulates in existing and planned units, with information provided to permitted public hunters on animals in the proposed Halehaa Unit. All

existing fences will be inspected and maintained. Fence construction at Halehaha Unit will be monitored. Scoping and planning for future fences in Kauai's priority watershed areas will continue. Kokee Resource Conservation Program staff will sweep and control weeds on 110 acres in units planned for fencing in the Alakai plateau and on 30 acres in the Wainiha Valley Unit. A contractor will continue Australian Tree Fern control using the helicopter "stinger" in Wainiha and Alakai Units. Vegetation recovery after hooved animal removal in the Kanaele Unit will be assessed, and staff and volunteers will continue conducting weed control.

### ***Kaua'i Natural Area Reserves***

Using FY 14 funds (\$95,000), Australian tree ferns in the Hono O Na Pali NAR will be controlled using aerial "stinger" herbicide applicator. Approximately 1800 plants will be sprayed and mapped. Ground and aerial surveys will determine treatment success and identify areas where further treatment is needed. The Koke'e Resource Conservation Program will control Himalayan ginger on 50 acres in Hono o Na Pali NAR using their volunteer program, which will match \$50,000 in funding from the watershed program.

### ***National Tropical Botanical Garden***

A 5.6 km fence surrounding the Upper Limahuli Preserve will be inspected and maintained on a quarterly basis and weed control will be done within 366 acres of the fenced unit.

### ***Kaua'i Invasive Species Council***

*Miconia*, a highly invasive tree was found in the Wailua area in the 1990's. New populations were discovered in 2003, creating a potential contamination area of around 3,500 acres. With an estimated potential habitat of over 200,000 acres on Kauai, this plant has the ability to destroy core watershed areas. KISC has been awarded \$30,000 to survey, treat and monitor *Miconia* on 2000 acres at Wailua Game Management Area, Wailua Homesteads and Wailua River State Park. KISC will conduct aerial surveys and treat using Herbicide Ballistic Technology as well as ground surveys and herbicide treatment or manual removal.

## **O`AHU**

***Waianae Mountains Watershed Partnership*** - 144,000 acres

FY 12 State Watershed Partnership Funds: \$ 92,000

FY 13 State Watershed Partnership Funds: \$160,000

FY14 State Watershed Partnership Funds: \$125,000

Total Annual Watershed Partnership Budget: \$323,000

Recent Accomplishments:

- Inspected and maintained 8.3 miles of fence
- Surveyed and controlled invasive species on 160 acres
- Conducted public outreach re fence construction and animal control

- Planned future watershed protection fences
- Conducted invasive weed control in priority watersheds
- Provided outreach to schools and hunters

FY 13 Actions (on-going):

Currently, partnership staff are scoping for watershed protection fences using ground and aerial surveys. Once scoping is complete, new fence lines will be proposed in a fencing feasibility report and biological surveys will be conducted. Quarterly feral goat surveys will continue and staff will assist DOFAW with goat control. Staff and volunteers will continue weed control efforts in Waianae Kai Forest Reserve and Ka‘ala NAR. Work with public schools to encourage stewardship, awareness of native ecosystems and the threat of fire continues, as well as collection of seed and propagation of native plants to restore areas affected by fire and invasive weeds. The partnership is also working with Ho‘o Mau Ke Ola, a drug rehabilitation center in Waianae to engage clients in weed control and outplanting. Pre-release monitoring for strawberry guava biocontrol is on-going.

FY 14 Deliverables (contracting under-way):

Partnership staff will assist DOFAW with outreach and logistics related to goat control at Hono‘uli‘uli Forest Reserve, Ka‘ala NAR, Waianae Kai Forest Reserve, Nanakuli Forest Reserve, and Makaha Forest Reserve. Priority invasive weeds will be controlled at Ka‘ala and Pahole NAR and Waianae Kai Forest Reserve (including firebreaks) in high priority watershed areas. Outreach will focus on hunters and the communities where fencing is planned.

***Ko‘olau Mountains Watershed Partnership*** – 98,737 total acres

FY12 State Watershed Partnership Funds:	\$ 92,500
FY13 State Watershed Partnership Funds:	\$110,000
FY 14 State Watershed Partnership Funds:	\$210,000
 Total Annual Watershed Partnership Budget:	 \$335,000

Recent Accomplishments:

- Surveyed and flagged 10.6 miles of new fenceline at Poamoho and Helemano and cleared the Poamoho fenceline
- Conducted rare species surveys along 6 miles of the proposed fenceline
- Coordinated outreach to hunters and conservation groups regarding new fencing
- Conducted ground and aerial surveys of the Waimanalo feral goat population
- Prepared a plan for goat control at Kualoa and Waimanalo
- Discovered a feral sheep population at Waimanalo that has been prioritized for removal
- Surveyed and controlled priority weeds at Poamoho and control and planning for a new invasive weed at Kahuku, devil weed (*Chromalaena odorata*)
- Hired and trained two new field staff

#### FY 13 Actions (on-going):

Staff conducted ground surveys of 1 mile of fenceline at the summit of Poamoho in the Ewa Forest Reserve, cleared helicopter landing zones, improved the Poamoho cabin to facilitate management, and cleared one mile of fenceline. Materials have been purchased for fence construction and a contract is under preparation. The partnership obtained a right of entry for private lands to control goats at Waimanalo and Kualoa, performed aerial and ground survey of over 214 acres and removed 10 sheep and 13 goats to date. Staff controlled 2 acres of strawberry guava, 21 acres of manuka, 0.85 acres *Tibouchina*, and 0.35 acres of *Heliocarpus papayanensis* and *Angiopteris evecta*. They also assisted OISC with control of devil weed at Kahuku Training Area. Monitoring of the strawberry guava biocontrol pre-release site is on-going. New and existing staff has been training in helicopter safety and sling loading, chainsaw safety, pesticide use, CPR and first aid, and personnel issues. Staff will inspect and maintain 8.3 miles of the Poamoho fence upon completion.

#### FY 14 Deliverables (contracting under-way):

Fence alignment, biological surveys, and weed control for the Kaluanui and Poamoho Phase 2 fences will be conducted. A 10-year plan to construct new fences on public and private watershed lands in the Ko`olau's will be drafted, requiring discussions with landowners, mapping and aerial surveys followed by ground surveys. Removal of feral goats and sheep at Waimanalo and Kualoa will continue. Staff will control feral pigs within the Poamoho Phase 1 fence. *Angiopteris evecta*, a non-native tree fern will be controlled. Monitoring of strawberry guava biocontrol will continue. Metrics will be developed for each action in the KMWP Management Plan (2002). Quarterly work trips will target 40-60 volunteers. Displays and handouts will be developed for at least 2 community events.

#### ***O`ahu Invasive Species Committee***

In FY 13, approximately \$28,000 was allocated for aerial surveys of two habitat-modifying weeds, *Miconia* and pampas grass, in Haiku and Ahuimanu valleys. Surveys are performed out to a one mile radius around all locations where mature (seeding) *Miconia* was found in the past. A total of 700 acres will be surveyed for *Miconia* and 1126 acres for pampas grass.

In FY14 OISC has been allocated \$100,000 to perform systematic ground and aerial surveys for *Miconia* over 460 acres in or adjacent to priority watersheds. Herbicide ballistic technology (using herbicide filled pellets shot with paint ball guns) will be used to control *Miconia* in steep areas of Manoa Valley. Funding will be used to detect, eliminate, and control devil weed, first found on O`ahu in 2011, and considered one of the world's worst weeds. It occurs only on O`ahu in one major infestation and three outlier populations.

#### ***O`ahu Natural Area Reserves***

Materials (\$200,000 FY13 funds) have been purchased to begin construction of fences at Poamoho and Kuluanui. Fencelines have been surveyed and flagged. Contracting is underway and fence construction should begin before January 2014. FY14 funds (\$32,000) will be used to

purchase a Forward Looking Infrared scope for animal control and for survey and aerial control of an invasive fern, *Angiopteris evecta*, in Poamoho.

## **MOLOKA‘I**

***East Moloka‘i Watershed Partnership*** – 32,983 total acres

FY 12 State Watershed Partnership Funds:	\$ 49,700
FY 13 State Watershed Partnership Funds:	\$ 25,434
FY 14 State Watershed Partnership Funds:	\$150,000

Total Annual Watershed Partnership Budget: \$630,000

Recent Accomplishments:

- Completed a draft management plan to extend the partnership to 10-14 new landowners and began community outreach for public input
- Improved key access routes on Maunahui Road for fire suppression and fire escape
- Improved 5 miles of a key fire break protecting the watershed forest

FY 13 Actions (on-going):

Feral animal control was conducted on 10,100 acres using Forward Looking Infrared technology resulting in the removal of 1083 goats and 3 deer from the South Slope of Moloka‘i. Vegetation is starting to return to a formerly barren area that contributed significant sediment to Molokai’s reefs. Rights of Entry with private landowners for animal control have been updated. An Invitation for Bid has been released for construction of a new fence at Kamakou to protect 800 acres of priority watershed and matching funds for the project have been provided by USDA-FS.

FY 14 Deliverables (contracting under-way):

Partnership and DOFAW staff will remove feral ungulates using Forward Looking Infrared detection and other methods. Prior to the completion of the Kamakou Fence, 10 hunt/sweeps will be conducted along with 5 hunt/sweeps after the fence is complete. Another 10 hunt/sweeps will cover Kamalo West, Pu`u Kolekole and Kawela fenced units. Surveys will determine location for approximately 2 miles of new fencing and the level of ungulate and weed presence in the proposed Pakui fenced unit. Staff will inspect and maintain 15.7 miles of existing fences.

Weed sweeps will cover 500 acres of existing fenced units and staff will assist when new invasive weed species are found in management units. Staff will also conduct semi-annual monitoring surveys along 18 transects on the south slope to help direct weed control strategies as well as monitor transects to detect changes in the forest in response to management actions.

The partnership will continue its role with the Moloka‘i Fire Task Force by facilitating meetings and participating in training. The partnership will also continue to coordinate field trips for K-12 students and the annual Moloka‘i Earth Day Celebration and collaborate with the Molokai `Aha Kiole (‘Aha Moku) to bring awareness and support to watershed projects.

## LANA'I

### *Lanai Forest and Watershed Partnership - 20,000 total acres*

FY 12 State Watershed Partnership Funds:	\$70,000
FY 13 State Watershed Partnership Funds:	\$90,000
FY 14 State Watershed Partnership Funds:	0

The Lana'ihale watershed has been reduced to less than 4,000 acres as weeds and Axis deer have degraded much of the remaining forest. Approximately 1800 acres are fenced. After last year's sale of Lanai, fence inspection and weed control have continued under watershed partnership funding but are gradually being turned over to Pulama Lana'i, the private company that recently purchased most of the island. No funds were requested for FY 14 from the new landowner.

#### Recent Accomplishments Utilizing FY 12 funds:

Staff and contractors secured deer mesh skirting, replaced rotten wooden posts and removed hazard trees to improve the fence protecting 1800 acres. Weed control work of incipient strawberry guava was continued and other weed species were also controlled in 60 acres in the highest areas of the watershed. Treatment focused on the highest elevation areas along the Munro Trail and ridges. This area is covered with native ferns which are essential to the functioning of the watershed as ferns not only capture rain and fog drip but also provide a deep detritus layer which allows the captured water to move down into the soil and into the aquifer.

#### FY13 Actions (on-going):

Actions include inspecting and maintaining 7 miles of fencing to protect remnant forest from deer and removing priority invasive species from 603 acres.

## MAUI

### *West Maui Mountains Watershed Partnership – 48,000 total acres*

FY 12 State Watershed Partnership Funds:	\$201,300
FY 13 State Watershed Partnership Funds:	\$330,000
FY 14 State Watershed Partnership Funds:	\$295,000

Total Annual Watershed Partnership Budget: \$770,000

#### Recent Accomplishments:

- Inspected and maintained, repaired and improved portions of 12.5 miles of fence, including monitoring vandalism by dirt bikers
- Surveyed ungulates over 410 acres with aerial and ground surveys, monitored transects for ungulate activity, and removed 24 pigs and 2 deer from priority watershed areas
- Conducted weed control across 26.5 acres

- Completed planning including a Conservation District Use Permit for fencing and drafts of updated Management Plan and Weed Plan.
- Reached 363 residents with outreach events and hikes
- Purchased two office trailers with private funds

FY13 Actions (on-going):

Partnership staff are contributing to interagency wildfire planning for West Maui through mapping fire infrastructure and biological resources. New strategic fencing is under construction (total 0.6 miles). Staff has repaired 1.75 miles of fence during inspection and maintenance for 7.2 miles of fence. Aerial surveys and ground control of 668 acres of invasive weeds are under way. Feral animals are being controlled on 5,870 acres. The partnership continues to monitor weed and feral ungulate transects to inform management decisions. Matching funds from the Hawaii Dept. of Health are being used to monitor stream water quality.

FY 14 Deliverables (contracting under-way):

20,000 acres will continue to be maintained at near-zero ungulate presence. Approximately 7.7 miles of fence will be regularly inspected and maintained to close breaches due to vandalism and tree fall. Routes for 5.8 miles of new fencing will be surveyed and finalized with a focus on the fences for which CIP funding has been budgeted for FY 15.

Weed control will focus on the highest elevation targets of each priority weed species to protect the pristine core of the watershed, with work progressing outward. Primary targets include strawberry guava, *Clidemia*, and pampas grass. Six volunteer service days will assist with weed control along a public access trail in West Maui.

In response to fire damage over thousands of acres in recent years, the partnership will continue ongoing work with the West Maui Wildfire Task Force. Participation in the Community Wildfire Protection Plan will qualify the area for federal wildfire suppression assistance.

A continuing monitoring program includes vegetation and ungulate transects, aerial surveys, photopoints, ground-scouting and water quality monitoring. The partnership will provide education through 5 outreach events. An Americorps intern will be trained and provided exposure to watershed stewardship as a profession.

***East Maui Watershed Partnership***– 100,000 total acres

FY 12 State Watershed Partnership Funds:	\$130,000
FY 13 State Watershed Partnership Funds:	\$198,000
FY 14 State Watershed Partnership Funds:	\$150,000
 Total Annual Watershed Partnership Budget:	 \$600,000

Recent Accomplishments utilizing FY 12 funds:

- Inspected and maintained 24 miles of watershed fences

- Constructed 1 mile of fence in the upper Hana Forest Reserve
- Checked and maintained 2,196 pig traps, removed 1 pig, and maintained ungulate free status in 7,000 acre core unit
- Monitored 21 ungulate and weed transects
- Controlled kahili ginger on 5 acres

FY 13 Actions (on-going):

Staff continues to inspect and maintain 7.8 miles of fence in the core area of the East Maui watershed. Priority invasive weeds and feral ungulates are being monitored and removed from priority zones within 7,000 acres. The partnership leads the on-going construction and coordination of Hana Forest Reserve fence protecting 3,000 acres.

FY 14 Deliverables (contracting under-way):

The majority of the work will take place on state lands in the Ko`olau and Hana Forest Reserves. The EMWP has been successful in significantly reducing the impacts of feral ungulates in its core managed areas but continued vigilance is required. Approximately 2,000 traps in the core area will be monitored twice per year, and traps will be added or moved, if necessary. Staff will continue to inspect and maintain 7.8 miles of fence on a quarterly basis, monitor weed and ungulate transects twice per year. Himalayan ginger will be controlled in a 29 acre unit of Wailuanui. Other priority weeds will be surveyed and removed along the 7.8 miles of fence.

***Leeward Haleakalā Watershed Restoration Partnership*** – 43,175 total acres

FY 12 State Watershed Partnership Funds:	\$165,000
FY 13 State Watershed Partnership Funds:	\$185,000
FY 14 State Watershed Partnership Funds:	\$190,000
 Total Annual Watershed Partnership Budget:	 \$600,000

Recent Accomplishments:

- Inspected and maintained 12.4 miles of fenceline across Leeward Haleakala
- Controlled mature gorse plants at DHHL-Kahikinui, continued monitoring for seedlings in 113 previously treated areas and modified control program with DHHL residents
- Conducted aerial treatment trials on the invasive trees silk oak and pine over 590 acres
- Controlled other weeds in Kahikinui including Mexican tulip poppy, faya tree, African tulip, Australian tree fern
- Conducted follow up surveys for mullein and fountain grass (none found)
- Mapped 13 new populations of *Bocconia frutescens* and controlled approximately 1000 individuals at Auwahi
- Improved data collection and reporting processes utilizing a geodatabase
- Planted 6,658 native seedlings with over 180 volunteers
- Drafted a plan for ungulate control and restoration at Kahikinui
- Awarded a contract for Phase II fencing at DHHL Kahikinui.

- Completed restoration plans for Nu`u Mauka and `Ulupalakua
- Received grant from the Hawaii Community Foundation for restoration at Nu`-Kaupo
- Received NPS grant to plan a connecting fence from Kahikinui across park lands
- Increased funding from Maui County to \$220,500
- Formed a preliminary Executive Committee for the watershed partnership

#### FY 13 Actions (on-going):

Staff has surveyed and flagged 3 miles and started construction for the Phase 2, DHHL Kahikinui Fence as well as continues to inspect and maintain 22.6 miles of existing fences. Meetings have been held to solicit input from adjacent landowners, DOFAW and community members to produce a feral animal control plan at DHHL Kahikinui. Invasive weed control is on-going over 708 acres. Staff and volunteers continue re-vegetation of 30 new acres at Auwahi, Ulupalakua. Community outreach will engage over 300 volunteers in reforestation this year. Work continues to create a data management system for reporting and management.

#### FY 14 Deliverables (contracting under-way):

LHWRP will survey and flag 4 miles for Phase 3 of the DHHL Kahikinui Fence and continue to inspect and maintain 26.3 miles of existing fences. With matching funds from NPS, staff will determine a connection route between Kahikinui Forest Reserve and the Nu`u Mauka-Kaupō watershed protection fence, the last remaining upper elevation south slope area without a landscape scale fence. In cooperation with other agencies and landowners, LHWRP will develop a regional evaluation and trial control program for *Bocconia* at Kahikinui and continue to survey, map and control incipient populations of invasive species across Haleakalā's south slope. They will implement ground-based invasive tree control trials at Haleakalā Ranch's south slope parcels to prevent the spread of silk oak populations into priority watershed forests. Remote sensing combined with on-the-ground standard vegetation monitoring will be used to establish baseline information to produce maps for 12 priority weed species and develop control strategies. Another goal will be to develop a comprehensive vegetation monitoring methodology that partners can use to ensure consistency across the landscape. Data will be collected from experimental trials to evaluate cost/benefit and efficacy of two restoration techniques - seed impregnated clay balls and seedling outplantings in three substrate types.

#### ***Maui Invasive Species Committee***

FY 14 work will include aerial detection and control of *Miconia* and pampas grass on Maui and Molokai. \$125,000 in funds are in the process of being awarded.

- Aerial surveys for *Miconia* (3,115 acres in East Maui and 1,200 acres in East Moloka'i)
- Use Herbicide Ballistic Technology to control *Miconia* on 1,075 acres in Ke'anae and Kīpahulu
- Control *Miconia* in Mauka and Nāhiku (2,040 acres) using aerial techniques.
- Provide geospatial data showing locations for all aerial survey and control work
- Provide summary data on the number of mature and immature plants removed
- Evaluate efficacy of different aerial control techniques and provide summary report

## HAWAII ISLAND

### ***Three Mountain Alliance – 1,116,300 acres***

FY 12 State Watershed Partnership Funds: \$335,000

FY 13 State Watershed Partnership Funds: \$357,000

FY 14 State Watershed Partnership Funds: \$405,000

Total Annual Watershed Partnership Budget: \$900,000

#### Recent Accomplishments utilizing FY 12 funds:

- Hired a contractor and purchased all materials to complete the Lupea Fence project.
- Constructed 0.5 miles of new fence at Lupea, North Kona, cleared 4 additional miles.
- Inspected 192 miles of fence and repaired and replaced 3.3 miles of fence at Keauhou
- Worked with Hawaii Community Correctional Center inmates on fence maintenance and installation of water tanks
- Updated the geodatabase and monitoring protocols
- Controlled fountain grass and reinforced fences at Pu`u Wa`awa`a
- Replaced 2.4 miles of rusted wire with plastic deer mesh at Ka`iholena, Ka`u
- Controlled priority weeds on 3 acres at Keaiwa
- Monitored faya treatment trials adjacent to Kapapala Forest Reserve
- Assisted with weed control at Manuka NAR (fountain grass on 502 acres and other priority weeds on 143 acres)
- Assisted with scouting for axis deer at Kalopa
- Propagated over 5000 seedlings for outplanting at Pu`u Maka`ala NAR and organized 18 planting events using over 300 volunteers and students
- Assisted with outreach and planning for the Ka`u Forest Reserve Management Plan
- Received a grant (\$350,000) from USFWS for fencing at Lupea
- Received a grant (\$235,000) from USDA-FS for coordination and outreach at the Kapapala Koa Canoe Forest
- Coordinated the Hawaii Nei Juried Art Exhibition at the Wailoa Art Center
- Assisted with Safe Harbor Agreement for Kamehameha Schools
- Assisted in planning efforts for the Hawaii Experimental Tropical Forest
- Continued feral cattle control at Honua`ula, Ka`u and Kapapala Forest Reserves
- To date DOFAW staff have removed 423 animals from Honua`ula Forest Reserve

#### FY 13 Actions (on-going):

The final mile of fence at Lupea to protect 6,000 acres has been completed. Fence inspection and maintenance of 192 miles of existing fences continues. Inmates from the Hawaii Community Correctional Center are trained to assist with fence inspections and other conservation activities. Invasive species control is targeted on 2530 acres. Reforestation at Kulani will continue despite changes in land use by other agencies. Data management development continues as the partnership engages in the statewide watershed partnership effort. Outreach at Kapapala Koa Canoe Forest has begun, with matching funds being provided by the USDA-FS. Staff is also assisting BIISC with axis deer control.

FY 14 Deliverables (contracting under-way):

USGS will design a survey method for ungulates within the new fenced 2,000 acre unit at Ka`u Forest Reserve and TMA staff will conduct two baseline surveys. Survey data will inform a model of feral pig abundance to show changes over time in response to management.

At Honua`ula Forest Reserve, DOFAW will control remaining feral cattle by fencing them into smaller units and trapping. An existing fence will be replaced and new fencing will be constructed to allow grazing of the lower portion of the Kealakehe Tract. Palani Ranch staff will construct the fence with materials purchased by DOFAW.

*Clidemia hirta*, a weed that takes over the understory of native forests, will be inoculated with a fungus at sites in Kohala, Hilo, and Waiakea Forest Reserves to test its efficacy. Monitoring will determine whether the fungus becomes self sustaining and spread to other sites.

***Kohala Watershed Partnership*** – 68,000 total acres

FY 12 State Watershed Partnership Funds:	\$ 85,000
FY 13 State Watershed Partnership Funds:	\$155,635
FY 14 State Watershed Partnership Funds:	\$226,000

Total Annual Watershed Partnership Budget:	\$450,000
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Recent Accomplishments:

- Inspected 11.5 miles of fenceline, repaired 6 breaches
- Constructed 4500 feet of new fenceline at Lahomene, Kohala with NARS crew
- Surveyed and flagged 1200 feet of new fenceline at Laupahoehoe Nui
- Surveyed and controlled an incipient invasive tree, *Rauvolfia vomitoria*, on 6,800 acres
- Controlled kahili ginger on 52 acres at Pu`u o Umi, Pu`u Pili and Kanea`a
- Controlled Cape ivy on 23 acres at Pu`u Pili
- Controlled strawberry guava on 180 acres at Kanea`a-Ponoholo
- Removed 66 pigs from 770 acres at Pu`u Pili and Kanea`a Biodiversity Units
- Used volunteers to plant 1658 plants of 17 species at the Koaia Corridor

FY 13 Actions (on-going):

Staff are inspecting and maintaining 12.8 miles of existing fence and controlling feral cattle on 300 acres. Alignment and flagging of a new fenceline at Laupahoehoenuei is underway. The partnership is assisting with construction of 1.5 miles of fence at Pu`u o Umi NAR. In addition, they will be constructing fences on the border of Kahua Ranch and DHHL lands to assist with improved feral cattle control.

FY 14 Deliverables (contracting under-way):

Staff will continue to maintain perimeter fences in 4 management areas, totaling 1094 acres. Fences will be repaired and retrofitted at the Waiapuka Feral Cattle Control Area (420 acres);

trapping and hunting will continue in the area. Aerial-assisted ground staff will conduct feral cattle hunts each quarter in the Ponoholo-Kahua Feral Cattle Control Area (435 acres). In the Kanea'a-Ponoholo Biodiversity Unit quarterly pig trapping will continue (4 traps - 464 acres). In the Pu'u O Umi NAR, Waimanu Bog Unit (70 acre sub-unit) staff will conduct weed control targeting Himalayan ginger on 5 acres per week; one week per quarter for 2 quarters. At Pu'u Pili (Kahua Ranch) and Kanea'a-Ponoholo control of Himalayan ginger and strawberry guava will be conducted over 2-3 days (2-3 acres) per quarter at each unit. Staff will continue to work towards containment of *Rauvolfia vomitoria* on DOFAW Kohala Forest Reserve and Surety Kohala lands (within 2000 acre "Containment Buffer") for 11-12 days per quarter. Control sweeps will focus on revisiting a total of 769 treated outlier plant locations per quarter.

***Mauna Kea Watershed Alliance***

FY 12 State Watershed Partnership Funds:	\$ 74,997
FY 13 State Watershed Partnership Funds:	\$131,000
FY 14 State Watershed Partnership Funds:	\$200,000
 Total Annual Watershed Partnership Budget:	 \$380,000

Recent Accomplishments:

- Began fence inspections of the Mauna Kea Forest Reserve Fence
- Familiarized partnership members with project areas through field trips
- Engaged Queen Liliuokalani Trust, the Hawaii Island Land Trust and TNC as a potential new members
- Worked with the County on road improvements on Keanakolou Road to improved access for fire control and management actions
- Purchased a four wheel drive van to transport volunteers and a 4WD Utility Vehicle to reduce fuel costs for field work
- Began planning for management of the upper Wailuku River
- Conducted gorse and cotoneaster control at Kukaiaiu Ranch
- Assisted partners with weed, ungulate and bird surveys
- Submitted proposals for private funding and awarded funds from Kamehameha Schools for Outreach and Education
- Worked with 14 different service learning groups (schools) and 7 short term interns
- Outplanted 7,595 trees at the Kanakaleonui Restoration site on DHHL land with 79% survival of outplants using a tree shelter to protect from frost
- Established a geodatabase to track all management actions
- Provided watershed education at the County Fair and Ocean Day

FY 13 Actions (on-going):

Staff are partnering with the Mauna Kea Forest Restoration Project to conduct fence inspection and maintenance over 63 miles of new at the Mauna Kea Forest Reserve. Feral animal control at Kanakaleonui continues on 525 acres of restoration area. Gorse control is focusing on 1200 acres Wailuku Headwaters. Restoration outplanting is continuing at the Pu'u Mali Palila Mitigation Area under CIP funding.

FY 14 Deliverables (contracting under-way):

The MKWA staff will refurbish 1.2 miles of fenceline at Waipahoehoe Management Unit at the top of the Hilo Forest Reserve. They will continue to inspect and maintain 47.5 miles of fenceline at Mauna Kea Forest Reserve and the fenceline surrounding 525 acres at Kanakaleonui Bird Corridor. They will survey, map and flag Waipahoehoe Management Unit, DHHL for new fencelines (1,160 acres) to enclose the other two boundaries of the unit in preparation for construction in the following year. They will control priority invasive weeds in the 1,160 acre Waipahoehoe Management Unit. Work will continue to control 2 gorse populations in Kukaiau Ranch (1 acre satellite populations). At the Kanakaleonui Bird Corridor staff will focus on controlling the last of the banana poka. They will conduct weed and ungulate surveys at Waipahoehoe Management Unit and perform understory monitoring at Umauma on Kamehameha Schools lands.

## **STATEWIDE WATERSHED PROJECTS**

### ***Biocontrol of Priority Weeds - FY 14 \$205,000***

Technical support will be provided to watershed partnerships statewide to establish populations of the biocontrol for strawberry guava, a leaf-galling scale insect, *Tectococcus ovatus*, under a variety of environmental conditions. The biocontrol agent will be reared on potted plants in a shade house and released in prepared field sites where monitoring of strawberry guava growth has established pre-release growth and fruiting rates. Project staff, under direction of the USDA-FS, will work with partners to establish source populations on each island and to demonstrate rearing and handling of the agent. Data collected will help develop information to guide future management.

Promising natural enemies of *Rubus ellipticus* (Himalayan raspberry) including both fungal and insect pathogens have been identified in recent surveys. This plant is regarded as one of the worst invasive species and is a major threat to native forested watersheds. Researchers will evaluate the specificity of potential agents in a quarantine facility to ensure there are no impacts on native species. Agents that appear sufficiently host-specific and damaging to the target weed will be evaluated against a full range of plant species. If successful, a risk assessment and application for field release permits will be prepared.

Potential new agents for biocontrol of *Miconia* including a butterfly (*Euselasia chrysippe*), a fruit weevil (*Anthonomus*), and a fruit galling wasp (*Allorhogas*) will be evaluated. Technical staff will be hired to maintain, in quarantine, a *Miconia* stem weevil and a flea beetle for *Tibouchina* and related melastomes. A post-doctoral researcher will facilitate evaluation of a shoot-galling nematode for *Clidemia* and *Miconia* by HDOA and international partners.

Host range testing of a number of highly promising natural enemies of Himalayan ginger, which threatens large areas of native rainforest in priority watershed areas will also be completed. This species does not require disturbance to thrive and can establish in intact, closed or open rainforest canopy and can also block streams. Biological control remains the only effective, long-term solution. Further surveys in its native range will build up existing cultures of 2 prioritized

biocontrol species, continue and complete host range testing and continue to catalogue and identify other promising agents.

### ***Watershed Geo-database and Reporting Framework - FY 14 \$10,000***

Natural Resource Data Solutions will continue to provide quality control and technical support for statewide quarterly reporting, compilation and metrics of accomplishments towards reaching the goals of the watershed initiative. All contractors will use the same format to establish goals and report accomplishments. The contractor will also design a framework so project managers can automate delivery of reports from their databases.

## **5.2 INFORMATION AND EDUCATION PROGRAM**

The mission statement of DLNR is to “Enhance, protect, conserve and manage Hawaii’s unique and limited natural, cultural and historic resources held in public trust for current and future generations of visitors and the people of Hawai‘i nei in partnership with others from the public and private sectors.” In order to be effective, staff uses a variety of methods to connect with communities across demographics and islands including: websites, social media, press releases, public outreach events, Project Learning Tree (PLT) educator workshops, field trips, classroom visits, and the YCC Program.

The education and information program is coordinated and staffed primarily by the DLNR-DOFAW information and education coordinator (full-time permanent), education specialist (full-time RCUH-PCSU)), and Americorps intern. To develop a robust, consistent program that meets the needs of all program sections, more permanent staff is needed. Despite these challenges, DOFAW continues to improve outreach efforts by securing grants and implementing programs that have demonstrated success nationally. These programs resonate with local needs and improve environmental literacy, contributing to a more environmentally conscious and sustainable island community.

### **Youth Conservation Corps (YCC) Program**

The year-round program is funded by NARF and supported by federal and community grants awarded to program manager, Kupu. DLNR secured 30 year-round Americorps members through Kupu in FY 13. The program gives young adults entry-level experience in natural resources management as they work alongside professional staff. Internships often lead to future jobs or advanced degrees in the field.

### **Project Learning Tree (PLT) Program**

The DLNR-DOFAW is the state coordinator for PLT, a national program that aims to “teach students how to think not what to think about complex environmental issues.” DOFAW staff coordinates workshops to provide educators with locally and nationally relevant resources so they can more effectively incorporate environmental education across disciplines using PLT’s standards-based, field tested materials. In 2013,



DOFAW was awarded a \$10,000 grant to build the capacity of Hawaii's program by offering 4 statewide facilitator refreshers and supporting staff attendance at the national PLT conference. 18 people attended the facilitator refreshers in FY 13 and roughly the same number will participate in the first half of FY 14. Outreach staff coordinated and facilitated 7 PLT educator workshops and certified an estimated 59 Hawai'i educators. PLT also recruited and trained new facilitators and continues to strive to integrate PLT in university education programs with 4 workshops planned for UH Manoa and private institutions in the fall of FY 14.

### **Outreach events, school visits, interpretive site visits, and community meetings**

Program staff participated in ~20 community outreach events; provided 25 classroom presentations to 711 students at 7 schools; and participated and/or coordinated 5 conferences that reached nearly 4,000 people. The program supported partners by providing staff on interpretive trips reaching approximately 416 students in addition to providing support at community meetings and informational sessions.



### **Hawai'i Environmental Education Alliance (HEEA)**

DOFAW staff has continued to support the Hawaii Environmental Education Alliance achieve its mission to promote and develop high quality environmental education by building relationships to improve networking and professionalism throughout Hawai'i:

- Coordinated the launch of HEEA.
- Provide HEEA interns office space and guidance when appropriate
- Support the coordination of the second annual Environmental Education Symposium which resulted in a convening of nearly 200 educators statewide.
- Met with the DOE Superintendent's office to discuss integrating environmental education in classrooms and adopting the Hawaii environmental Literacy Plan.

For more information on the organization and the work that has developed as a result of this \$80k USFS grant through DOFAW, please visit [www.heea.org](http://www.heea.org).

### **Web, Social Networking, Video, and Traditional Media**

Staff maintains the DOFAW website. The section has been working with the Chairperson's office on the show "DLNR Revealed," a public access program on Olelo. Staff also develops press releases; coordinate media support and maintain a social networking presence by providing DLNR's Public Information Office with details to be "tweeted" via Twitter.

## **6. ANALYSIS OF THE PROBLEMS AND ISSUES ENCOUNTERED**

The dedicated funding provided by the NARF has been critical for the sustained and continuous management needed to protect natural areas. The NARF also has allowed staff to provide matching funds and aggressively pursue alternate funding via grant state, federal and private funding opportunities. These grants allow staff to maintain the conservation progress made the last few years due to Act 156, Session Laws of Hawai'i 2005 (Legacy Land Conservation Act).

Protecting natural areas and ensuring the future of rare native ecosystems and species requires sustained management actions as described above. Actions such as weed and feral animal control and fire prevention must be conducted over the landscape as feral ungulates invasive weeds, and fires do not recognize ownership boundaries. Having watershed partnerships on every island has contributed greatly to the state, federal and private partners' ability to appropriately manage these large forested areas. However, coordinating and assisting the conservation efforts of these partners adds additional responsibilities on the already understaffed NARS crews.

The NARS Program has been able to partner with the RCUH-PCSU to supplement important NARS management work and to assist in the coordination of watershed management actions, including invasive species control, fence construction, field surveys, and rare plant collection, propagation, and outplanting. This partnership with UH is critical, providing learning opportunities to young professionals in the biological sciences, and giving the State much-needed assistance with on-the-ground conservation. In addition, partnerships with other landowners and volunteers provide another method by which the NARS Program is working to meet conservation needs.

Controlling the threats of invasive weeds and feral animals remains a challenge. At the landscape level, control of feral animals is possible using a combination of public hunting, exclusion by fences, staff control and aerial shooting. Building and maintaining fences, although effective, is very expensive. Unfortunately, some members of the public do not understand the connection between feral ungulates and damage to native forest and watershed – raising objections to both fencing and animal control as unnecessary. Invasive weeds modify habitat and require constant effort to combat effectively. With dedicated funding provided by NARF, it is anticipated that many of the management needs can begin to be addressed on a consistent, ongoing basis.

Fence costs are increasing more than anticipated due to new requirements from the Department of Commerce and Consumer Affairs and the Department of Labor. Contracts now require bonding, which has impacted the ability of some of the smaller contractors to bid on fencing, and in some cases this has limited competition for these jobs.

Natural resource protection and management are long-term efforts requiring time and energy commitments not often found in other projects. Restoration projects often take years before results are discernible. Several of the projects funded this year could take years to achieve the desired objectives. It is important to note that management and protection of natural areas, watersheds and native ecosystems need to continue for the long term.

Partnership and community-based management programs have proven to be an effective tool for leveraging funds and securing stakeholder participation and commitment. Such initiatives also require a concerted effort and often take a long time to establish and implement. NAPP-funded Preserves typically form the core of conservation partnerships, in part due to the dedicated state funding. To help with organization, facilitation, and implementation, partnership steering committees, community advisory councils, and facilitated working groups have been established to help management partners address local concerns now and in the coming years.

## **7. CONCLUSION**

Detailed project plans and accomplishment reports for NARS, NAPP, Watershed Partnership Program, Rare Plant Program, NIP and YCC are available through links from DOFAW website <http://dlnr.hawaii.gov/ecosystems/> or from the:

Native Ecosystem Section Manager  
Department of Land and Natural Resources Telephone: 587-0054  
Division of Forestry and Wildlife Fax: 587-0064  
1151 Punchbowl Street, Room 325 E-mail:randall.w.kennedy@hawaii.gov  
Honolulu, HI 96813

To download a copy of this report, please go to <http://hawaii.gov/dlnr/reports>

## **8. FINANCIAL CONDITION OF THE NATURAL AREA RESERVE FUND**

NARF received revenues from the Conveyance Tax (25% of total Conveyance Tax revenues) on real estate transactions. The cash balance of NARF at the beginning of FY 13 was \$5,962,144.07 with prior year's encumbrances of \$3,844,144, leaving available cash balance of \$2,118,000. FY 13 NARF revenues were \$13,684,653.46 with \$13,674,538.67 from the Conveyance Tax and \$10,114.79 from miscellaneous (See Table B).

FY 13 expenditures totaled \$6,993,264.83 representing expenditures of approximately \$3,554,386.56 of FY 13 encumbrances, \$2,779,870.14 for FY 12 encumbrances, \$68,303.13 for FY 11 encumbrances and \$590,705.00 central services fees. Outstanding FY 13 encumbrances totaled \$4,333,082.32. Of the FY 13 allowed spending cap, \$7,210,793.49 operating funds were encumbered.

The cash balance of NARF at the beginning of FY 14 was \$9,502,602.70 with \$4,334,006.67 as the available cash balance. Projections are for revenues to be somewhat lower than FY 14 as sources within the real estate sector have indicated slowing sales due mainly to rising interest rates. However a few large transactions may help maintain revenues, as was the case in FY 13.

NARF also supports other programs and projects, some of which are administered by DOFAW:

FY 13 transfers totaled \$3,211,826 which were: \$1,500,000 to the Forest Stewardship Fund through direct transfers that included \$600,000 to the Forest Stewardship Program pursuant to §247-7, HRS, and \$900,000 for Forest Reserve management; \$1,610,896 to HISC; \$95,751 to DLNR Administrative Services Office for an accountant & partial funding of an account clerk and data processing analyst; and \$5,179 to Department of General Services/Risk Management for insurance premiums. These expenditures are reported in their respective legislative reports. FY 14 transfers are expected to total \$4,020,000 and include: \$600,000 to the Forest Stewardship Program through direct transfers pursuant to §247-7, HRS; \$1,500,000 for Forest Reserve management; \$1,800,000 to HISC; \$5,000 to the Department of Accounting and General Services/Risk Management; and \$115,000 to DLNR Administrative Services Office. These

expenditures are reported in their respective legislative reports. Please see Table C for summary of NARF combined drawdown.

**APPENDIX A. LNR 407 – NARS and WATERSHED MANAGEMENT BUDGET SUMMARY**

**Table A:**

**FY 13 NARS Expenditures (General Fund Appropriation G-13-047)**

	<b>Total = \$655,461.52</b>
NARS 'A' Personnel Expenditures FY 13 =	\$ 639,202.25
NARS 'B' Operating Expenditures FY 13 =	\$ 16,259.27

**FY 14 NARS Allocation (General Fund Appropriation G-14-047)**

	<b>Total = \$4,006,638</b>
NARS 'A' Personnel Allocation FY 14 (29 positions including 11 new Watershed Initiative Positions) =	\$ 717,137
Traditional NARS 'B' Operating Allocations FY 14 =	\$ 253,939
Watershed Grants Program Allocation =	\$3,035,562

**Table B: NAR Fund Revenues FY 13 (S-13-342)**

<b>Source</b>	<b>Timeframe</b>	<b>Amount</b>
FY 13 Conveyance Tax	7/1/2012 – 6/30/2013	\$ 13,674,538.67
Other	7/1/2012 – 6/30/2013	\$ 10,114.79
<b>Total Revenues =</b>		<b>\$ 13,684,653.46</b>

**Table C: FY 13 NAR Fund Drawdown (Special Fund Appropriation S-13-342)**

	<b>Total = \$11,689,999.88</b>
NARF 'A' Personnel Expenditures	= \$ 1,267,380.39
NARF Operational Expenditures/Encumbrances	= \$ 7,210,793.49
Transfers Out	= \$ 3,211,826.00

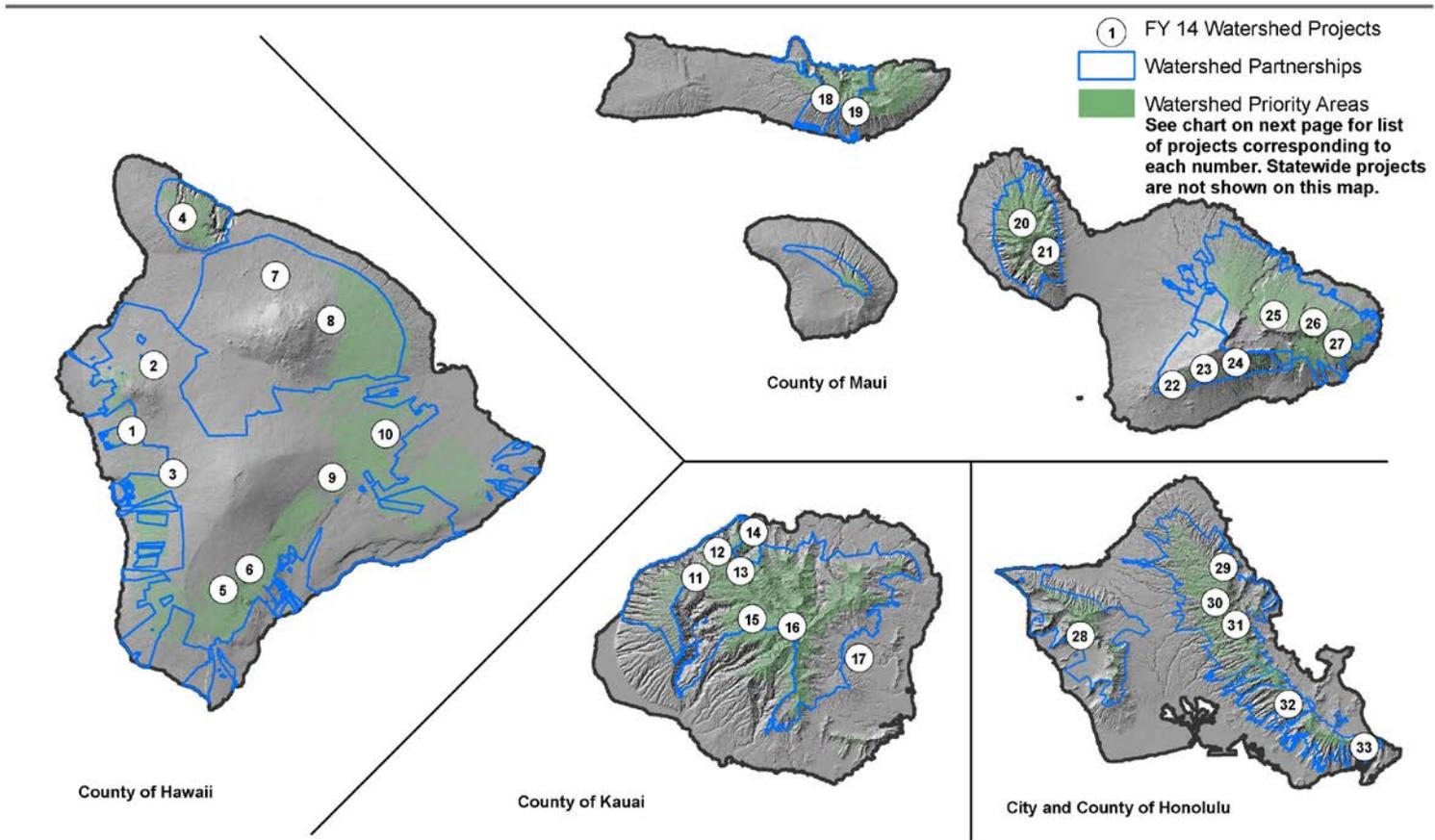
**FY 14 NAR Fund Allocation (Special Fund Appropriation S-14-342)**

	<b>Total = \$11,215,731</b>
NARF 'A' Personnel Allocation	= \$2,317,493
NARF Traditional Operational Allocations	= \$4,878,238
Transfers Out	= \$4,020,000

**APPENDIX B. WATERSHED INITIATIVE PROJECTS FY 14 (MAP & SUMMARY TABLE)**



Watershed Initiative Projects FY 14



Features approximate and subject to change. October 2013 - DOFAW - 587-4170.

<b>Map No.</b>	<b>Island</b>	<b>Fiscal Year 2014 Watershed Project</b>	<b>Offeror</b>	<b>Watershed Grant</b>	<b>CIP</b>
1	Hawaii	TMA - Protecting Forested Watersheds	DOFAW	\$ 125,000	
2	Hawaii	Puu Waawaa-Henahena Restoration	DOFAW		\$ 450,000
3	Hawaii	TMA	PCSU/RCUH	\$ 235,000	
4	Hawaii	Kohala Watershed Partnership	The Kohala Center	\$ 226,000	
5	Hawaii	Kau Forest Reserve	DOFAW		\$ 240,000
6	Hawaii	TMA Ungulate Control	USGS	\$ 7,000	
7	Hawaii	Mauna Kea Forest Restoration Project	DOFAW		\$ 100,000
8	Hawaii	Mauna Kea Watershed Alliance	PCSU/RCUH	\$ 200,000	
9	Hawaii	TMA Upland Forested Watershed Protection	Hwn. Silversword Foundation, Inc.	\$ 45,000	
10	Hawaii	Puu Makaala NAR	DOFAW		\$ 550,000
11	Kauai	Kauai Invasive Plant Control	Garden Island RC&D	\$ 50,000	
12	Kauai	Hono O Na Pali NAR	DOFAW		\$ 225,000
13	Kauai	Kauai NARs	DOFAW	\$ 95,000	
14	Kauai	Upper Limahuli Preserve	National Tropical Botanical Garden	\$ 15,000	
15	Kauai	Alakai Wilderness Preserve	DOFAW		\$1,075,000
16	Kauai	KWA	TNC	\$ 295,000	
17	Kauai	KISC	PCSU/RCUH	\$ 30,000	
18	Molokai/Maui	Kamakou and Kahikinui Fencing	DOFAW	\$ 120,562	
19	Molokai	EMoWP	TNC	\$ 150,000	
20	Maui	W. Maui Priority Watershed Protection	Malama Kahalawai, Inc.	\$ 295,000	
21	Maui	Control of Invasive Plants in Priority Watersheds of Maui Nui	PCSU/RCUH/ Maui Invasive Species Comm.	\$ 125,000	
22	Maui	Protection of Leeward Haleakala Priority Watersheds	Tri-Isle RC&D/LHWRP	\$ 190,000	

23	Maui	Kahikinui Forest Restoration	DOFAW		\$ 565,000
24	Maui	Nakula and Kahikinui Reserves	DOFAW		\$ 105,000
25	Maui	East Maui Watershed Partnership	PCSU/RCUH	\$ 150,000	
26	Maui	Hanawi NAR	DOFAW		\$ 350,000
27	Maui	Hana Forest Reserve	DOFAW		\$ 450,000
28	Oahu	Waianae Mts. Watershed Partnership	PCSU/RCUH	\$ 125,000	
29	Oahu	Kaluanui NAR	DOFAW		\$ 300,000
30	Oahu	Oahu DOFAW	DOFAW	\$ 32,000	
31	Oahu	Ewa Forest Reserve	DOFAW		\$ 590,000
32	Oahu	Eradication of Incipient Weeds in Oahu's High Priority Watersheds	PCSU/RCUH/OISC	\$ 100,000	
33	Oahu	KMWP	PCSU/RCUH	\$ 210,000	
n/a	Statewide	Biocontrol: <i>H. garnerianum</i> , Str. Guava, <i>R. ellipticus</i> , <i>Miconia</i> , & <i>Melastomes</i>	USFS	\$ 205,000	
n/a	Statewide	Watershed Data Management and Support	Natural Resource Data Solutions	\$ 10,000	
<b>TOTAL</b>				<b>\$3,035,562</b>	<b>\$5,000,000</b>