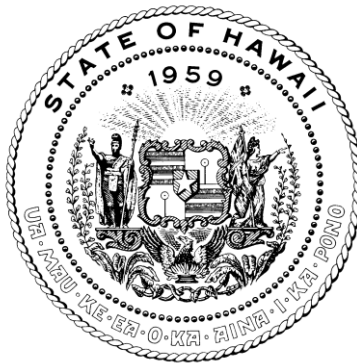


**REPORT TO THE TWENTY-SIXTH LEGISLATURE
REGULAR SESSION OF 2012**

**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 HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE**

IN RESPONSE TO SECTION 195-6.6, HAWAII REVISIED STATUTES

**HONOLULU, HAWAII
NOVEMBER 2011**

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LIST OF ACRONYMS

ARRA American Recovery and Reinvestment Act
BLNR Board of Land and Natural Resources
DLNR Department of Land and Natural Resources
DAR Division of Aquatic 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
ESA Endangered Species Act
FSP Forest Stewardship Program
FY Fiscal Year
GIS Geographic Information System
HAWP Hawai‘i Association of Watershed Partnerships
HDOA Hawai‘i Department of Agriculture
HISC Hawai‘i Invasive Species Committee
HRPRG Hawai‘i Rare Plant Restoration Group
HRS Hawai‘i Revised Statutes
ISC 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
SHPD State Historic Preservation Division
T&E Threatened and Endangered
TMA Three Mountain Alliance
TNC the Nature Conservancy
UH University of Hawaii
USDA United States Department of Agriculture
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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NATURAL AREA RESERVE FUND**

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, but is not limited to, a description of activities and accomplishments, compliance with Chapter 42F, HRS, analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the management plans, status of public hunting opportunities, financial report, and plans and management objectives for the next fiscal year for the NARS Program and NAPP, an overview of the financial condition of NARF, including receipts and expenditures from NARF for the previous fiscal year, and a brief discussion of activities and goals for other programs funded through NARF.

NATURAL AREA RESERVES SYSTEM (NARS)

1. DESCRIPTION OF ACTIVITIES AND ACCOMPLISHMENTS

The statewide NARS currently consists of 20 reserves comprised of approximately 123,431 acres on five islands. NARS was established to protect the best remaining native ecosystems and geological sites in the State. Annual program activities are based primarily on the long-term integrated 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. 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), fire prevention and control, rare plant restoration, monitoring, public outreach, and maintenance of existing infrastructure, such as trails and signs. For detailed information on the NARS, please go to <http://hawaii.gov/dlnr/dofaw/nars>.

NARS Commission

The NARS Commission (<http://hawaii.gov/dlnr/dofaw/nars/nars-commission>) was established by statute as an advisory body to the Department of Land and Natural Resources (DLNR) under §195-6, HRS.

- The full NARS Commission (Commission) met three times in Fiscal Year (FY) 11.

- BLNR or its authorized representative, with the approval of the Commission, recommended the issue of 64 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.

The Commission discussed and recommended areas to BLNR as reserves, and advised management of existing reserves, such as for ‘Āhihi Kīna‘u Reserve on Maui.

In FY 11, the Commission recommended the extension of three reserves – Kīpāhoehoe and Pu‘u Maka‘ala NAR, both on Hawai‘i Island, and Ka‘ena (O‘ahu). The new Nakula NAR was officially designated in March 2011 following approval from BLNR and the Governor. Recommending priority areas to be added to NARS helps to ensure that a wide spectrum of unique natural areas is preserved for Hawaii’s current and future generations.

Statewide activities and accomplishments

In FY 11, NARS continued to implement the Strategic Plan for the NARS (<http://hawaii.gov/dlnr/dofaw/nars/SP9.4.08.pdf>). Operational management plans were developed for each island program to prioritize and coordinate future activities to meet NARS’ statutory mandates.

NARS staff conducted ground and aerial surveys for feral ungulates. Fencing continues to be an important tool to facilitate the reduction in animal populations. Existing fences were inspected and maintained, and new fences were constructed. Public hunting, control by NARS staff by means of trapping, snaring (in remote/fenced areas), and aerial shooting were used to reduce non-native ungulate populations. The type of control measure implemented depends on the resources available, the reserve location, the effectiveness of public hunting, terrain features, and the relative abundances of ungulates. NARS staff continues to work with hunting organizations, DLNR’s 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 nearly every reserve, and priority weeds have been identified for each reserve (and sometimes for units within reserves). Volunteers provide significant manual labor to assist in weed control efforts. NARS staff also communicates with the respective Island Invasive Species Committee (ISC’s) to prevent duplication and coordinate efforts where possible. However, because ISC’s efforts are directed towards incipient species, this coordination is most effective when responding to new weed outbreaks in NARS and less so when controlling the established species that threaten native ecosystems. Monitoring of rare plant populations, collection of seeds and propagules, and outplanting of T&E plants are ongoing efforts to protect and enhance the rare plants found within NARs. Additional information about the accomplishments of the State’s Rare Plant Program in FY 11 follows the island descriptions below.

Staff worked to prevent 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 also an ongoing activity. Staff maintained over 500 signs throughout NARS. Information and boundary signs were installed or replaced in several reserves. Approximately 133 miles of existing trails were maintained in various reserves, primarily for management purposes. Trail maintenance includes alien plant control along the trails to minimize the spread of weeds to new areas. Over 151 miles of existing ungulate control fence were maintained with regularly scheduled inspections, and immediate repairs were made to prevent ungulate ingress and subsequent damage to the resource. Existing helipads were maintained to facilitate management and monitoring 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 remains important. Training during FY 11 included first aid, wilderness first aid, cardiopulmonary resuscitation (CPR), fire response, all terrain vehicle (ATV) operation, helicopter safety, chainsaw, herbicide and pesticide use, ungulate control methods, procurement procedures, ArcGIS, leadership, negotiation, and mediation skills. In addition, NARS staff attended the Hawaii Conservation Conference, an annual three-day conference attended by nearly 1,000 resource management professionals in the State. Finally, NARS staff continued the successful "exchange program" between Maui and Hawai'i districts where natural resource managers share field methods and develop new skills.

Outreach and coordination of volunteers has increased the public's appreciation of the NARS and Hawaii's unique natural resources. Staff led volunteer trips, outreach presentations, and guided hikes and field visits for numerous groups, including visiting dignitaries, staff from cooperating agencies, school groups, and the University of Hawai'i (UH). NARS Administrative staff responded to multiple requests for information from the public (as forwarded by the DLNR Public Information Officer) and created press releases for news media published statewide. NARS Administrative staff continued participation with the national Natural Areas Association, the Hawai'i Conservation Alliance (DOFAW Representative), the Pacific Island Climate Change Co-operative (DOFAW Representative), the Forest Stewardship Advisory Committee, the Hawai'i Conservation Conference (primary organizer), the Bioprospecting Commission (DLNR representative), and provided ongoing assistance to other DOFAW programs.

Finally, NARS staff continues to leverage resources and increase effectiveness by working with the 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 to NARS.

Reserve activities and accomplishments by island

Major accomplishments within individual reserves during the past year include the following:

Kaua'i

Management included constructing and maintaining fences, conducting intensive weed control, collecting and propagating T&E plants, and monitoring invasive plants and animals. In addition to work inside NARS, staff controlled wildfires and worked to conserve other important biological areas in Kauaʻi. Efforts included protection of rare bog ecosystems in the Alakaʻi Wilderness Preserve with partners such as the Nature Conservancy (TNC), United States Fish and Wildlife Service (USFWS), the Plant Extinction Prevention Program (PEP), the Kōkeʻe Resource Conservation Program, and the Kauaʻi Watershed Alliance (KWA). Additionally, the Kauaʻi NARS program trained and mentored two Youth Conservation Corp (YCC) interns, led and supervised other youth service trips, and coordinated community outreach events. Specific accomplishments within individual reserves include:

Kuʻia (1,636 acres; dry and mesic forest with perennial streams): Completed construction of a 20 acre fence totaling 0.85 miles and cleared 1.65 miles of fence line for an 87 acre enclosure; conducted intensive weed control within all fenced units killing 100 karaka nut, 159 silk oak, 1,947 lantana, 18,389 guava, and 3,175 blackberry; maintained and repaired 2.67 miles of fence line; outplanted 34 different native species totaling 1,582 individual plants (including 427 individuals of 6 listed T&E species and one PEP species). Hunters reported 1,979 trips in Unit H (which includes Kuʻia), resulting in 169 pigs, 74 goats, and 3 blacktail deer removed.

Hono O Nā Pali (3,579 acres; mesic and wet forest with perennial streams): Conducted ungulate monitoring; collected seeds from four species of rare plants; built weatherport to facilitate management in remote areas; mapped locations of Australian tree fern and Kahili ginger using high resolution aerial imagery; and completed an updated management plan and initiated an environmental assessment for the protection of approximately 2,290 acres of upper elevation wet forest. Two special fly-in hunts were conducted in the lower reserve that resulted in the removal of three pigs and 19 goats. Additionally, hunters reported 214 hunting trips in Unit G (which includes Hono O Nā Pali), resulting in the removal of 132 goats and eight pigs.



Kauaʻi NARS Staff
and Partners

O'ahu

Ongoing management includes weed control, ungulate monitoring and removal, fence maintenance, rare plant propagation and outplanting, habitat protection, and supervising the O'ahu Army Natural Resource Program (OANRP) Mākua Implementation Plan actions in the O'ahu Reserves. Staff also worked to conserve and survey new areas proposed as NARS. NARS also contributed expertise and staff assistance in other DOFAW lands by conducting surveys, monitoring rare plant populations, collecting seeds and cuttings from T&E plants and controlling invasive species. The American Recovery and Reinvestment Act (ARRA) Weed Specialist initiated 18 herbicide weed control trials across a spectrum of native and alien dominated backcountry settings. Staff provided environmental outreach by presenting at special events and leading and coordinating multiple volunteer service trips to each reserve. Specific accomplishments within individual reserves include:

Pahole (658 acres; dry and mesic forest): Maintained 319 acres of the NAR as feral pig free and continued to implement ungulate control measures to remove feral pigs from the remaining 339 acres; conducted regularly scheduled inspections and maintenance on approximately 9.3 miles of fence; conducted seven staff escorted hunts (61.5 Oahu NARS staff hours) within fenced area with volunteer hunters contributing approximately 400 volunteer hours and removing four pigs; staff implemented control measures removed 33 pigs; and controlled 6,300 *Toona ciliata* (Australian red cedar) across 181 acres.

Ka'ala (1,100 acres; dryland to wet shrub forest): Maintained fences; monitored ungulate activity and conducted control when necessary; monitored and removed feral goats in the adjacent upper Mokulē'ia Forest Reserve to reduce the potential for goat ingress into the NAR; maintained lower Ka'ala access road; assisted OANRP with sphagnum moss eradication; scoped a strategic ungulate barrier as part of Wai'anae Watershed Partnership; completed ¾ of the Ka'ala boardwalk replacement project in collaboration with the OANRP, volunteers, and DLNR's Division of Boating and Ocean Recreation.

Ka'ena Point (12 acres; coastal dune ecosystem): Completed construction of a predator-proof fence and implemented comprehensive predator removal. This fence dramatically improved the efficiency of predator control. Once the fence was completed, larger mammals were quickly removed and an extensive effort to remove rodents (rats and mice) was initiated. All predators, except for a small number of mice have been removed from the fenced area. Predator work was completed in collaboration with Pacific Rim Conservation and United States Department of Agriculture (USDA) Wildlife Services. Other accomplishments include installed updated signage regarding resource issues and rules; conducted wedge-tailed shearwater census; removed 17,105 *Leucaena leucocephala* (koa haole) with staff and volunteers. Participated in planning efforts including the DLNR Ka'ena Point Stewardship Group, which resulted in BLNR approval of the final action plan for Ka'ena Point and implementation of emergency actions, and the Ka'ena Point Advisory Group, a public planning process for management of the area.



Ka‘ena Point Predator-Proof Fence construction was completed in FY 11

- 1st predator proof-fence in Hawai‘i and the United States
- Provides a 60 acre coastal refuge for 11 T&E plant species and two protected seabird species, including Laysan Albatross

Maui

Management of Maui District NARS (Seven reserves, 21,493 acres) includes fence construction, ungulate control, people/human impact management, invasive weed control, rare plant and animal protection and monitoring, and public outreach in Reserves on Maui and Moloka‘i. ARRA funds were used to fully staff temporary field crew (five personnel) to perform weed control and fence building. In addition to conservation management within NARS, NARS staff assisted a variety of watershed partnerships and other conservation partners. For example, staff assisted East Moloka‘i Watershed Partnership (EMoWP) in conducting aerial shooting missions that removed 499 goats from the south slope of Moloka‘i, worked with Maui Invasive Species Committee (MISC) on removal of pampas grass, built a deck for Maui DOFAW in Hana Forest Reserve, and completed a six-year fence construction project in cooperation with Kalaupapa National Historic Park to upgrade existing fences and construct new fences totaling 6.25 miles that protect 1,000 acres. 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 TNC of Hawaii’s Marine Program to finalize the draft Management Plan. Staff worked with the United States Army Corps of Engineers,

its contractors, other DLNR divisions and federal agencies on project planning and mitigation of impacts for proposed unexploded ordinance surveys. Staff provided a daily management presence; implemented operational guidelines; continued to maintain access restrictions for the two-year closure meant to prevent damage to resources due to recreational overuse; deterred many incidents of illegal activity including poaching, theft, and illegal entry into closed areas with DLNR's Division of Conservation and Resources Enforcement (DOCARE), the Maui Police Department, and the Maui Citizens Patrol; maintained contracts for the maintenance of two portable toilets, daily opening of parking area and daily trash removal; installed storage container and temporary generator power to improve the on-site ranger station/office trailer to better facilitate on-site management; controlled pickleweed in two acres in anchialine ponds; and removed marine debris along coastline of Cape Kinau.

Hanawi (7,500 acres; 'ōhi'a wet and cloud forest, alpine grassland, and perennial streams): Kept pigs out of 2,000 acres which required maintenance of over 10 miles of fence, and replacement of .5 miles of old fence using \$14,000 grant from USFWS. Staff maintained existing shelters and completed construction of 2 miles out of five miles of a new mid-elevation fence to protect a larger region of core habitat for endangered wildlife and plants. Assisted with forest bird surveys by re-marking transects and monitored weeds and pig activity along these transects.

Nakula (1,420 acres; leeward montane koa/'ōhi'a forest and alpine shrublands): This new reserve was established in FY 11. Staff transported fencing material to construct two miles of fence and inspected and maintained 3 miles of existing boundary fence.



A rare koa-'ōhi'a forest perched high on the slopes of leeward Haleakalā has been designated Nakula Natural Area Reserve, the 20th such reserve in the state.

Kanaio (876 acres; halapepe and lama dry forest): Issued Invitation for Bid for 3.8 miles of fence construction needed to complete a 1,600 acre fenced unit and conducted ten contractor site visits. Inspected and maintained completed portion of boundary fence (3.25 miles). Staff controlled and performed weed management in more the 550 acres of the Reserve this year as follows: wattle control with staff and YCC in 100 acres, Christmas berry control in 5.5 acres, bocconia control in 477 acres.

West Maui (6,702 acres; pili grassland, mesic, wet, and cloud forest, montane bogs, and perennial streams): Kahakuloa section: Staff inspected, maintained and repaired 3.25 miles of fence on a monthly basis. Pana'ewa section: staff inspected and maintained boundary fence three times and monitored snares.

Pu'u Ali'i (1,330 acres; wet shrubland and forest with perennial streams): To prevent ungulate damage, staff finished constructing an final one mile of fence to enclose the majority of the Reserve (1,000 acres) and inspected and maintained 6.5 miles of existing fence; staff led three community volunteer hunts (total of eight volunteer days) in cooperation with Molokai Pig Hunter's Association that removed two pigs from within the fenced area.

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 673 feral animals (goats, pigs, and deer) during four missions.

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, coordinated ungulate removal at the Pu'u Wa'awa'a Forest Bird Sanctuary, and hosted both YCC summer teams and four 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, rare plant protection (reintroducing almost 12,000 plants of T&E and common native species), and contracting for surveys needed for appropriate management (archaeological inventories, boundary surveys, etc.). During FY 11, staff built 2.75 miles of new fencing and monitored over 62 miles of transects to support the protection of native ecosystems.

For outreach and education, staff conducted a number of volunteer trips and developed and distributed outreach materials during special events such as Earth Day, the Merrie Monarch Parade and the Hawaii County Fair; hosted the Hawaii Nei Art contest featuring native species artwork in cooperation with the Volcano Art Center, the National Park Service (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 the new added Kūlani portion of the Pu'u Maka'ala NAR. The program recently hired a new outreach and education specialist that will increase the capacity of the program to implement outreach activities. 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 including meetings and funding an archaeological inventory and a cultural resources management plan; reviewed permit requests to access the NAR for research and for educational opportunities; maintained a 9.9 acre fenced unit for the

protection of the endangered silversword and other rare alpine species; monitored six monitoring transects inside and outside of the fenced unit; controlled animals (10 sheep removed). Of significance to the recovery of the critically endangered Mauna Kea silversword, four new seedlings from a new wild plant were propagated this year. The Hawai'i Island NARS Manager continued to participate as a member on the Mauna Kea Management Board and participated in the Environment Subcommittee and Administrative Rules Subcommittee. 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): Continued to support the Kohala Watershed Partnership efforts to implement the Kohala Watershed Management Plan; maintained existing fenced units and constructed 1.3 miles of new fence in the remote portions of the Reserve to protect watershed and native species habitat. A new population of Hawaiian petrel was discovered that was previously thought to be extinct from the area, and additional surveys were conducted in partnership with the Kaua'i Seabird Recovery project and USDA Wildlife Services; maintained over 19 miles of trails; controlled key weeds and ungulates in sensitive areas; and outplanted T&E species. Most significant this FY, was the reading of over 22 miles of long-term monitoring transects covering the entire Reserve. Data was recorded on the state of the vegetation including weed distribution and ungulate activity. These transects are read on a 10 year rotation, and data collected in FY 11 will be analyzed in the coming fiscal year.

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; fence maintenance; rare plant monitoring and outplanting; ungulate control (15 feral pigs removed); invasive species control; and installation and collection of data for six vegetation monitoring plots. Approximately 0.8 miles of new fence was built to complete a new 9.9 acres fenced area to protect forest and provide sites for rare plant restoration. The Hawai'i Island NARS Manager assisted with the establishment and on-going meetings of the newly formed Laupāhoehoe Advisory Council.

Kahauale'a (22,521 acres; wet forest with volcanic activity): Continued to monitor the eruptive activity at Kilauea (commencing July 21, 2007) by coordinating with the United States Geological Survey (USGS) Hawaiian Volcano Observatory, Hawai'i Civil Defense, DOCARE, and other agencies, adding and maintaining signage, and closing the NAR to public use due to safety concerns; BLNR decided to continue the closure of Kahauale'a, for an additional term of up to two years until July 24, 2013. 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 was forged to assist with boundary fencing along a portion of the NAR near Volcano.

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 11.

Pu‘u Maka‘ala (18,730 acres; wet forest): Maintained fencing; continued to remove feral pigs from the Wright Road Unit using volunteers (10 pigs removed); continued weed control in the 2,500 acre Wright Road Unit and completed control in over 385 acres; 18 miles of weed monitoring transects were also read and analyzed in the Wright Road Unit; weeds were controlled in the 330 acre Aku Unit; scouted areas for new conservation units and further revised the draft Pu‘u Maka‘ala NAR Management plan and draft Environmental Assessment; cooperated with TMA in conducting rare plant outplanting, invasive weed control; and supervised volunteers. The most significant accomplishment for in FY 11 was the addition of over 6,600 acres of the former Kūlani Correctional Facility lands to the NAR. Multiple management actions were achieved in this new addition including the re-establishment and reading of over six miles of native forest bird monitoring transects; upgrades to 1.5 miles of fencing and preparation and acquisition of materials for an additional 3.5 miles of upgrades; survey of over 15 miles of ungulate monitoring transects; monitored outplants of the endangered silversword; and conducted multiple outreach trips including hosting the annual Christmas Bird counts. Discussions with the Youth Challenge Academy, which currently occupies the Kūlani facility, are ongoing to integrate a natural resource management component into their program, partnering with the NARS program and TMA.



NARS staff monitored outplantings of the endangered Mauna Loa Silversword in the newly acquired Kūlani addition to Pu‘u Maka‘ala NAR

Manukā (25,550 acres; coastal to subalpine forest): Removed feral pigs and goats in cooperation with adjacent landowners; removed invasive species (fountain grass) over 14,000 acres; cleaned tons of trash from the coastal areas and illegal dumping sites including one event hosted in partnership with the Hawaii Wildlife Revolving Fund; completed the contract with a professional surveyor to determine the NAR boundary; conducted rare plant outplanting; maintained existing fence units, roads, and trails, upgraded 2 miles of upper boundary fence to prevent the ingress of mouflon sheep, conducted 4 animals drives to control a remnant population of mouflon sheep in the upper portion of the NAR (four sheep removed); monitored over two miles of weed transects in the 220 acre Olopuia Unit; monitored fenced units in the coastal area for native coastal vegetation recovery; monitored and controlled goats in the makai section of

the NAR (10 goats removed); conducted coastal anchialine pond surveys and monitoring in cooperation with DLNR's Division of Aquatic Resources (DAR); continued to update draft Manukā NAR management plan and commence development of a draft environmental assessment.

Kīpāhoehoe (5,583 acres; mesic to wet forest): maintained fenced enclosure of 1,500 acres; conducted rare plant protection through seed collection and outplanting; invasive species control; upgraded water holding capacity to 5,000 gallons to facilitate fire suppression and invasive species control; continued road and trail maintenance.

Other Areas: The Hawai'i Island NARS Program assisted with management of other protected areas outside of the eight Reserves. These activities included assisting with invasive weed control, fire break maintenance, rare species outplanting, and the removal of feral ungulates from the Pu'u Wa'awa'a Forest Bird Sanctuary (over 1,700 feral pigs removed) and the Pu'u Wa'awa'a Cone Unit. NARS assisted TNC with animal removal in their Honomalino preserve. Additionally, NARS helped the PEPP program construct 0.8 miles of fence to provide 10 acres for rare plant protection in the Kukuiope section of the South Kona Forest Reserve. NARS staff assisted the TMA with vegetation transect monitoring in the Lupea project area on Kamehameha Schools land. The NARS program is committed to assisting with the Hawai'i Island Axis Deer Working Group and has already committed staff time and resources to ensuring the successful control of this newly discovered threat.

Rare Plant Species Restoration and Protection

The focus of the NARF support of the Rare Plant Program for FY 11 was providing matching funds for projects primarily supported by Section 6 of the federal Endangered Species Act (ESA). These projects include habitat protection and enhancement within the NARS on the island of Hawai'i; support for the propagation efforts of Volcano, Pahole, Olinda and Kōke'e Rare Plant Facilities; Lyon Arboretum Micropropagation/Seed Storage Facilities; and the statewide Plant Extinction Prevention Program.

Hawaii's Plant Extinction Prevention (PEP) Program leads the largest T&E plant protection effort in the State, spanning the main Hawaiian Islands, 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 201 target species. This year, PEP staff (consisting of 4 FTE island coordinators on Kaua'i, O'ahu, Maui, and Hawai'i; one FTE statewide coordinator; .75 FTE on Moloka'i; 3 part-time technicians on Moloka'i, Maui and O'ahu) implemented protection actions for 114 T&E plant species, 24 Candidate, and 18 Species of Concern. Population monitoring was implemented for 103 species, placing 49 of these into *ex situ* cultivation at a cooperating rare plant nursery, botanical garden, at Lyon Arboretum's Micropropagation or Seed Storage Lab. Surveys were conducted for 34 species, of which 11 species were either rediscovered or new populations were found. To protect the wild plants, non-native animal and plant threats were managed for 48 PEP

species. Threat management entailed alien plant control, ungulate-proof fence construction and maintenance, rat trapping, and bagging fruits to protect them from invertebrate and rodent pests. Noteworthy projects include the reintroduction of 24 rare species into protected habitat. Of all the PEP species that have known extant individuals, the PEP Program has collected propagules from 64% (108) of these. An additional 5% of PEP species were collected by partnering agencies, resulting in almost 70% of all PEP species placed in protective *ex situ* sites. Focus on collecting propagules from the remaining 30% of PEP species remains a high priority for the PEP Program.

The first step in developing a **Statewide Rare Plant Database** was the entry of the rare plant monitoring data collected by the PEP Program. The development of the database was partially funded by NARF. Detailed demographic information provided by the PEP program is serving as a template for data entry for a statewide information program. The database will expand to include data from members of the Hawaii Rare Plant Restoration Group (HRPRG) as funds become available to support a web-based data entry.

Volcano, Pahole, Kokee, and Olinda Rare Plant Facilities and Lyon Arboretum's Micropropagation Laboratory are propagation/storage facilities for rare plant taxa for the state of Hawaii. These facilities are a state-wide effort to prevent native plant extinction by increasing plant numbers for reintroduction into their natural habitat. These facilities work from a list of approximately 600 rare plant species. Working closely with our DOFAW staff from Forestry and NARS, collaborators, and partners, rare plant populations are tracked and new founders are added to maximize genetic diversity. Collaboration occurs with federal, state and private land managers to replant species into appropriate habitats. The number of rare plant taxa propagated for outplanting this fiscal year was over 200, with 9,672 individuals outplanted along with 3,219 more common native species to create more robust native plant communities.

Lyon Arboretum also provides tissue culture/seed storage testing for species which successful propagation techniques are not yet known. In FY 11, the Lyon Arboretum Micropropagation Laboratory received 135 submissions representing 48 native Hawaiian species. 30 (62%) of these species are federally listed as Endangered, 10 (21%) Species of Concern, 3(6%) Candidate

The main focus in the **Hawai'i district NAR rare plant program** is the protection of large areas of endangered plant habitat. Threats that affect large areas are managed to facilitate successful plant reintroductions by outplanting into large, ungulate-free fenced areas. In FY 11, NAR staff planted over 10,000 common and rare plants from Volcano Rare Plant Facility and State Tree Nursery with support from NARF and ESA funds (Section 6 grants). Additionally, staff maintained fences, protecting over 21,500 acres of rare plant habitat.



Olinda Rare Plant Facility is part of a state-wide effort to prevent native plant extinction by growing plants for reintroduction into their natural habitat

Native Invertebrate Program (NIP)

The DLNR-DOFAW Invertebrate Conservation Program was initiated in June 2009. The objective of this program is to expand the knowledge and resources available, to effectively direct resource management, monitoring, research, conservation, and policy decisions relating to federally listed T&E Hawaiian invertebrate species, as well as other native invertebrate species. Conservation and management efforts have not historically focused on invertebrates, despite that they constitute more than 95% of the wildlife in the State. This is unfortunate considering that our native insects, spiders, snails, crustaceans (etc.) showcase astounding biological diversity and unique ecological adaptations; they provide untold educational and research opportunities for both youth and university professors alike.

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

The need to effectively manage native invertebrate species on state owned and managed lands is great. To date, USFWS has conferred endangered species status on a variety of unique native Hawaiian invertebrates at risk of extinction, including one moth, one wolf spider, 40 tree snails, one amphipod, 11 fruit flies, and five damselflies. Additional listings are imminent, for example, USFWS determined that seven species of Hawaiian yellow-faced bees are warranted for listing, and have now been designated as species of concern. NIP provides guidance to DLNR staff regarding management of invertebrates on state lands and works actively with federal agencies and private landowners to address management needs on private and federally managed lands.

Threats to native invertebrates include [but are not limited to] habitat destruction or alteration, loss of host plants, and the invasion and establishment of non-native species. It is therefore necessary for the staff entomologist to collaborate frequently with other DOFAW staff and partner agencies to address the multitude of issues affecting native invertebrate conservation. In FY11, addressing the broad ecological impacts of invasive insect pest species remained a high priority of the program.

NIP Staff

NIP staff has just one temporary full-time entomologist. Despite limited personnel, NIP has facilitated partnerships within the State, as well as obtained federal funds to address specific research, management and conservation needs.

NIP FY11 Accomplishments:

- Received first year of funding from nationally competitive grant from the USDA Forest Service to survey and monitor naio thrips infestation on Hawai‘i Island (in conjunction with DOFAW Forest Health program). FY 11 - FY 13 funds total \$128,647; FY 11 \$42,700. Seven monitoring trips were completed in conjunction with UH Dept. of Plant and Environmental Protection Sciences.
- Received nationally competitive grant from USDA Forest Service to conduct census of wiliwili populations and monitor long-term wiliwili health on O‘ahu, Maui and Hawai‘i islands (in conjunction with DOFAW Forest Health program). FY 12 - FY 14 funds total \$132,000.
- Received nationally competitive Department of Defense Legacy Resource Program grant: “Assessing abundance and distribution of 19 yellow-faced bee species on O‘ahu and Hawai‘i Island”. Funds total \$109,123, and project will begin in FY 12.
- Received NARS funds to hire contractor in Australia/New Zealand to conduct field surveys to determine the native range of naio thrips. Surveys were successful, and identified the pests origin to be Tasmania. This information will be used as the basis for future biological control efforts, if it is determined such a program is warranted for this pest. Funds totaled \$21,200.
- Received NARS funds to begin development of the statewide native invertebrate database to centralize historical and contemporary records/information for integration into conservation and management planning. Funds totaled \$50,000.
- Received \$100,000 USFWS ESA Section 6 funding for two projects in FY 12:
 - 1) Completing development of the statewide invertebrate database;
 - 2) Establishing Snail Extinction Prevention program to target snail species on the brink of extinction which are not currently listed as T&E species.
- Monitored native wiliwili trees (*Erythrina sandwicensis*) to assess the impacts of the invasive erythrina gall wasp and the introduced biological control agent

released to control it. Monitoring was completed in conjunction with the Hawaii Department of Agriculture (HDOA) Plant Pest Control staff at 13 field sites across O‘ahu, Maui and Hawai‘i. Entomologist completed a total of five surveys on O‘ahu, five surveys trips to Maui, and six survey trips to Hawai‘i Island.

- 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 which participate in, or benefit from, invertebrate research, management or conservation: HDOA, UH, USDA, USGS, USFWS, U.S. Army Environmental, Hawaii Wildlife Fund, Bishop Museum, TNC, Hawaii Invasive Species Committee (HISC), University of California Berkeley, Cornell University. Three meetings have been held (Hilo, Kahului and Honolulu).
- Completed second year of surveys of the endangered Blackburn Sphinx moth in Pu‘u wa‘awa‘a Experimental Forest, to observe larval ecology and determine if sequential sampling may be used to estimate population densities for mitigation purposes. Surveys were conducted in collaboration with USFWS.
- Served as point of contact and managed operations for the *Anopheles* mosquito emergency rapid response team in December 2010-January 2011, in collaboration with Hawai‘i Dept. of Health, Tripler Army Medical Center and O‘ahu Invasive Species Committee. Conducted delimiting surveys and trapping for populations of this mosquito species which is known to be a vector of malaria.
- Assisted USFWS with invertebrate surveys on Johnston Atoll (August 2010, May 2011), as part of a long-legged ant control project on the island.
- Participated in meetings with USFWS regarding mitigation for unlawful take of endangered *Achatinella* tree snails at Mt. Ka‘ala and future preventative actions.



The Native Invertebrate Program is working on the protection and recovery of endangered tree snails like *Achatinella mustelina*

- Reviewed and issued 42 Native Invertebrate Scientific Research and Collecting

permits.

- Developed NIP website to provide project and contact information to the public: www.hawaii.gov/dlnr/dofaw/native-invertebrate-conservation-program/nativeinvertebrate
- Represented NIP at the Hawaiian Conservation Conference, Nahelehele Dry Forest Symposium, Entomological Society of America Pacific Branch meeting, Office of Mauna Kea Management Wekiu Bug Working Group meeting, and Hawai'i Biological Control Working Group meeting.

2. COMPLIANCE WITH CHAPTER 42F, HAWAII REVISD STATUES (HRS), REQUIREMENTS FOR GRANTS AND SUBSIDIES

No grants or subsidies were issued pursuant to Chapter 42F, HRS.

3. ANALYSIS OF THE PROBLEMS AND ISSUES ENCOUNTERED

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 goats, pigs, deer, and sheep, 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 presents challenges and adds additional responsibilities on the already understaffed NARS crews.

Still, with short-term federal and state funding, the NARS Program has been able to partner with the Pacific Cooperative Studies Unit of UH 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.

In FY 11, DOFAW's NARF budget for natural area reserves management remained low. Fortunately funding continued for 24 temporary positions, and one permanent state position, to support needed on-the-ground fieldwork in NARS and increase coordination with the watershed partnerships. These positions significantly increased the capacity of NARS to conduct on-the-ground management. In addition, temporary infusion of USDA Forest Service ARRA funds helped to sustain some NARS actions in FY 11, however, additional federal recovery funds are not available in FY12.

Realizing the budgetary challenges expected due to the slow economic recovery, staff has, and will continue to aggressively pursue alternate funding via grant opportunities. Fortunately they have been successful in obtaining minor state and federal grants. These grants should partially offset the reduction in funding from traditional sources and allow

staff to partially maintain the conservation progress made the last few years due to Act 156, Session Laws of Hawaii 2005 (Legacy Land Conservation Act).

Other actions by staff to address the shortfall in state funding support from the Conveyance Tax and the General Fund:

- Successfully requested several federal granting agencies to reduce or wave match requirements;
- Increase use of in-kind match;
- Increase collaboration and integration of the different programs to improve the effectiveness and benefits of these programs and further the objective of protecting Hawaii's natural resources;
- Increase cooperative efforts among multiple agencies, non-governmental organizations, landowners, and private citizens to maximize conservation efforts while increasing available match;

Controlling the threats of invasive weeds and feral animals remains a challenge. Feral animals damage native vegetation, destroy habitat for endangered species, contribute to erosion, and damage watershed capacity. 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 and vigilance to combat effectively. With the dedicated funding provided by NARF, it is anticipated that many of the management needs of NARS can begin to be addressed on a consistent, ongoing basis.

4. STATUS OF PUBLIC HUNTING OPPORTUNITIES

Under the 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.

5. FINANCIAL REPORT

NARS is financially supported partly through the General Fund under program LNR-407 (see Table A). In FY 11, general fund expenditures were \$556,264 in personnel costs and \$52,927 in operational costs, totaling \$609,191. 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 29 and 42.

6. PLANS AND MANAGEMENT OBJECTIVES FOR THE NEXT FISCAL YEAR

Where appropriate, reserve management activities will be guided by management plans. Plan implementation will focus on preventing, eliminating or controlling the spread of non-native plants and animals that have a detrimental effect on native ecosystems. Other

management considerations will include monitoring, research, public education, and volunteer support. Statewide, partnerships (particularly watershed partnerships) will continue to play an important role in the management of the reserves, with resources shared to manage across property boundaries.

Plans and management objectives for FY 12 include continued work on pending fencing projects; continued collaboration with watershed partnerships to cooperatively manage areas on a landscape level; continued control and removal of feral animals; continued control of habitat-modifying invasive species; update of individual reserve management plans, and the implementation of the DLNR approved strategic plan. Due to the economic downturn, and associated reduction in general and special funds, staff will generally focus on completing existing initiatives and maintaining regular management activities.

In FY 12, NARS staff is assisting the DLNR Chairperson on a major new initiative to increase on-the-ground protection and restoration of native forest watersheds, the source of Hawaii's fresh water. Climate change impacts as well as threatened watersheds may be decreasing groundwater and surface water availability. A plan to prioritize and protect watersheds has been drafted, with actions listed to sustain areas with high groundwater recharge. Protecting watersheds will also reduce flooding and erosion, absorb greenhouse gases, and protect irreplaceable cultural and natural values of the upland forests. When finalized, the plan will be available on the DLNR website at <http://hawaii.gov/dlnr/>.

Other activities planned for FY 12 include:

- Conversion of DOFAW positions from temporary to permanent status. These positions have secure funding from NARF and need to be made permanent in order to retain adequate existing staffing to ensure proper management and administration of DOFAW programs.
- Due to anticipated increased NARF revenues, raise the spending ceiling by \$2,000,000 to implement additional projects for watershed partnerships, NARS and YCC. Forested watersheds across the State need greater protection if they are to serve our needs in the future. The increase in funding will help implement six island-based watershed management plans, management plans for the individual natural area reserves, and the State Comprehensive Wildlife Conservation Strategy.
- Standardizing the monitoring database used by NARS and watershed partnerships to increase the consistency of reporting accomplishments and monitoring results

Specific Plans and Objectives by Branch (FY 12):

Hawai'i: The NARS Program will continue the process to update the management plan for Manukā NAR, including collaboration with other interested DLNR divisions; continue cooperation with USGS Hawaiian Volcano Observatory to monitor the current lava flow within Kahauale'a NAR; continue to work with the TMA to advance management goals in Pu'u Maka'ala NAR including invasive species control, rare plant work, and protection of native habitat; continue to work with the Kohala Watershed

Partnership to implement the partnership management plan; continue participation in the Hawai'i Experimental Tropical Forest, particularly as it overlaps with Laupāhoehoe NAR; and continue collaboration with the Office of Mauna Kea Management to address management needs there; continue an active outreach and education program; continue an active rare plant restoration program; and repair and maintain existing infrastructure (management cabins).

Maui:

The NARS Program on Maui will continue working to protect Hanawi NAR through fence construction, inspection, maintenance, and cyclic replacement, ungulate control, weed control, and rare species monitoring, in cooperation with East Maui Watershed Area (EMWP) and the Maui Forest Bird Recovery Project; continue construction of fencing at Kanaio NAR and initiate update of the management plan; conduct fence inspection and maintenance of the boundary fence at Kahakuloa NAR and removal of animals, in cooperation with the West Maui Mountains Watershed Partnership (WMMWP); continue to work to remove animals from the fenced mauka unit in Pu'u Ali'i NAR; continue aerial shooting of large feral animal (particularly goat) populations on the north shore of Moloka'i; continue implementation of access restrictions for Ahihi-Kinau (maintaining closed areas, conduct monitoring surveys, finish the management plan in coordination with the Ahihi-Kinau Advisory Group and TNC; continue working with the U.S. Army Corps of Engineers, its contractors, other DLNR divisions and federal agencies on project planning and mitigation of impacts for unexploded ordinance removal at Ahihi-Kinau Reserve..

O'ahu:

The NARS Program will continue ungulate removal from all fenced units within Pahole and Ka'ala NARs; continue monitoring and removing rodent predators within the Ka'ena Point Predator Proof Fence; continue predator suppression efforts outside the fence as well; continue implementing new herbicide efficacy trials; continue with programmatic weed control; initiate weed seed viability trials; continue the process for formally adding the upper portion of Poamoho section of Ewa Forest Reserve into NARS; continue to work with United States Army in the Mākua and O'ahu training area mitigation process; continue implementation of the successful rare plant program; continue active participation in the DLNR Ka'ena Point Stewardship Group; and continue monitoring of seabird populations at Ka'ena Point.

Kaua'i:

The NARS Program will initiate the update of the management plan for Ku'ia NAR and complete the Environmental Assessment for the updated Hono O Nā Pali NAR management plan; complete fencing in Ku'ia NAR for the 87 acre Kawai'ula enclosure; conduct weed and rare plant monitoring in Ku'ia and Hono O Nā Pali NAR; build remote campsites and begin predator control work in Hono O Nā Pali NAR, continue implementation of the successful rare plant program; collaborate to support activities by the KWA; and expand an outreach and education program.

NATURAL AREA PARTNERSHIP PROGRAM (NAPP)

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. This Program complements the existing NARS by providing long-term protection and management of unique natural resources on private lands.

NAPP provides financial support for a full range of management activities to protect, restore and enhance significant native resources and geological features. 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. For more information on NAPP, see <http://hawaii.gov/dlnr/dofaw/napp>.

PU‘U KUKUI WATERSHED PRESERVE

Landowner: Maui Land & Pineapple Co.

Managing Partner: Maui Land & Pineapple Co.

Entered NAPP: FY 94

With over 8,304 acres, the Pu‘u Kukui Watershed Preserve forms the core of regional protection efforts of the West Maui Mountains Watershed Partnership’s (WMMWP) 48,000 contiguous acres that serves as a significant water source for West Maui residents and industries. Fourteen native natural communities, two of them rare, are found in the preserve along with over 40 rare plant species (8 listed as endangered), six endemic species of land snails and three native forest birds. In FY 11, accomplishments included maintaining 60 percent of the preserve as ungulate-free for five or more years, continuing ungulate control where ungulates remain (12 pigs were removed by public hunters, 23 by staff), installing .3 miles of 8 ft fencing, inspecting and maintaining 5.8 miles of existing fencing, monitoring of alien threats, invasive weed control, and rare species protection and restoration outplantings in cooperation with the PEP program.

Goals for FY 12 are to advance the existing level of management to maintain the native ecosystem as an intact watershed and protect the habitat of rare Hawaiian plants and animals. Management will include monitoring of weed distribution and weed control activities, continuing to increase the ungulate-free acreage in the Preserve by installing an additional 1.5 mile of eight ft fences for Axis deer exclusion in partnership with WMMWP, inspecting and maintaining fences annually, continuing permit hunting program, continuing to participate and provide leadership in WMMWP, offering monthly volunteer service trips open to the community, providing support for approved research projects in the watershed and increasing community outreach.

KĀNEPU‘U PRESERVE

Landowner: Castle and Cooke Resorts, LLC

Managing Partner: The Nature Conservancy (TNC)

Entered NAPP: FY 92

The Kānepu‘u Preserve on Lāna‘i comprises 590 acres in seven distinct units and was created to protect and enhance the lama/olopua (*Diospyros/Nestegis*) dryland forest that once covered large portions of the lowlands on Maui, Moloka‘i, Kaho‘olawe, and Lāna‘i. Eleven rare plants, six of them federally listed as endangered, have been reported from the Preserve. TNC sub-awards with Tri-Isle RC&D Council, Inc. to accomplish essential stewardship activities in Kānepu‘u Preserve. Management activities were conducted primarily by a subcontractor, Bob Hera, including animal control, invasive plant control, fire control, and occasional restoration and research support. TNC staff provides routine oversight and assists with management activities on occasion throughout the year. The primary management accomplishments during FY 11 included: 1) 22 contractor and volunteer hunts were conducted with 30 deer removed resulting in the creation of two new deer free subunits; 2) Regular monthly fence maintenance, repair and inspections of Kānepu‘u and Kahue boundary fences were completed; 3) Intensive weed removal inside and around the two small enclosures in Kānepu‘u unit (Lapaiki iki and Kānepu‘u iki) was conducted - weeds removed include Christmasberry, lantana, guinea grass, koa haole and other invasive species; 4) A new subunit approximately 11 acres in size was created (primarily through PEP with USFWS funding) within the Kahue Unit in order to protect T&E and endemic plant species and facilitate deer removal; 5) Completed installation of an irrigation system to feed Kānepu‘u unit and Kahue unit; and 6) Several miles of fire breaks were routinely mowed and maintained to prevent potential fire damage.

In FY 12, TNC plans to continue sub-awarding through Tri-Isle RC&D to carry out ungulate control, fence maintenance, weed control and fire control.

KAPUNAKEA PRESERVE

Landowner: Kā‘anapali Land Management Corp.

Managing Partner TNC

Entered NAPP: FY 92

Kapunakea Preserve is a 1,264-acre preserve that is a component of regional protection efforts for the important watershed and native ecosystems found in the West Maui Mountains. Kapunakea Preserve’s upper elevations are recognized as among the highest quality native areas in the State, containing 11 native communities, 34 rare species of plants (10 federally listed), and four rare snail species.

TNC sub-awards with Tri-Isle RC&D Council, Inc. to accomplish essential stewardship activities, through WMMWP. In FY11, WMMWP conducted animal control and monitoring, an annual aerial weed survey, maintained infrastructure, and provided occasional access to researchers. The primary management accomplishments in FY11 were: 1) Seven pigs were removed from lower, less native habitat; 2) Staff conducted two hunts in the Preserve, with no pigs captured; 3) Ungulate activity transects were monitored with less than 1% of ungulate activity detected; 4) Boundary fences were inspected monthly with minor improvements and enforcements added to increase barrier efficacy; 5) One aerial survey was conducted to locate strawberry guava (*Psidium cattleianum*) outliers and to monitor any pig activity; 6) Weed control to prevent expansion into pristine areas included 65 strawberry guava, 39 *Tibouchina herbacea*, and 24 *Clidemia hirta* individuals were detected and removed; and 9) TNC served on the WMMWP Executive Committee and supported funding and watershed activities.

In FY 12, TNC plans to continue granting funds through a sub-award for WMMWP 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

The Pelekunu Preserve, located on the north shore of Moloka‘i, is a 5,759-acre preserve established to protect the free-flowing Pelekunu Valley stream system, one of the best in the State. It is also part of a larger regional management effort that provides protection to over 22,000 contiguous acres. Pelekunu Stream contains nearly all the native Hawaiian freshwater fish, crustacean, and mollusk species. In addition, 28 rare plants, six endemic forest birds, and two endemic land snail species have been reported from the area. 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.

Due to the high cost of helicopter access to the Valley, and reduced staff and budget, access to the Valley in FY11 was minimal. Weed control activities and targeted ground hunts could not be conducted. TNC’s primary means of ungulate control in Pelekunu was to support NARS continued aerial shooting of Molokai’s north shore with mapping, spotting and flight-following services. Aerial shooting of pigs, goats and deer is only conducted in areas of steep terrain that are unsafe for hunters and dogs. Lack of ground hunts appears to be resulting in increased animal activity in the valley.

In FY 12, management efforts will include support of NARS aerial shooting efforts and ground hunts, if funding is available. The FY12 stream surveys will include community members to build on-island capacity to conduct the monitoring. 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

The 2,774-acre Kamakou Preserve helps increase regional protection efforts for the important watershed and native communities found in East Moloka‘i. Kamakou Preserve protects 40 rare plant species, 23 of which are listed as federally endangered. In addition, the Preserve protects habitat for five native forest bird and five rare native land snail species. 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.

In FY11, TNC began contracting Pono Pacific to conduct systematic Global Positioning System (GPS)-documented animal and weed control “sweeps” of priority areas. Animal

control sweeps using one dog per hunter were conducted over a quarter of the Preserve in its most remote and intact areas. Contractors and staff also removed *Clidemia*, passionfruit, strawberry guava, New Zealand flax, black wattle, Christmas berry, rose, ginger, karakanut, and blackberry in the preserve. Over 200 plants of five critically rare species (< 50 individuals in the wild) were outplanted in the Preserve by the PEP Program. TNC staff provided logistical support for several research projects conducted in the preserve. Public outreach programs continued to be important both on- and off-site.

For FY 12, priority wet forest sweeps will be the focus of ungulate and weed control efforts. Other activities will include supporting researchers and conducting community outreach.

MO‘OMOMI PRESERVE

Landowner: TNC

Managing Partner: TNC

Entered NAP Program: FY 95

This 921-acre preserve on the northwest shore of Moloka‘i contains one of the largest and best remaining dune ecosystems in Hawaii. Mo‘omomi contains eight rare plant species and one rare native plant community. Green sea turtles, wedge-tailed shearwaters, Laysan albatrosses, and Hawaiian monk seals are known to use the area. In addition, Mo‘omomi contains significant archaeological, paleontological, and cultural resources.

In FY 11, TNC began contracting Moloka‘i Land Trust, an adjacent landowner and conservation partner, to implement predator control and kiawe removal to restore coastal habitat. MLT successfully removed over half an acre of kiawe and five acres of annual weeds in former kiawe removal areas. Trapping of feral cats, mongoose, and rats provided for safer nesting grounds for the colony of native wedge-tailed shearwaters, despite 58 of the indigenous birds being killed by feral dogs in late FY11. Preliminary results from an on-going project to measure the impact of deer in the Preserve suggest that while deer preferentially graze on non-native species, their trampling can lead to a decrease in native cover. Community outreach programs included preserve hikes and off-site activities.

In FY 12, TNC will continue with kiawe removal efforts, the monitoring project to measure the impact of deer in the Preserve, predator control, support of training to local partnering agencies in feral dog control, and monitoring of the wedge-tailed shearwaters’ nesting colony. Community outreach and support of research projects will also continue.

WAIKAMOI PRESERVE

Landowner: Haleakala Ranch Company

Managing Partner: TNC

Entered NAP Program: FY 95

The 5,230-acre Waikamoi Preserve helps increase regional protection efforts for an important watershed and the native species found in the East Maui Watershed Partnership (EMWP) area. Thirteen bird species have been reported from Waikamoi, including seven T&E species. Fourteen native natural communities, two of them rare, are found in the Preserve along with 35 rare plant species. Management activities during FY 11 were

primarily focused on getting a new sub-award for Waikamoi management activities underway with EMWP, with the primary objective being to maintain low to zero levels of ungulates in the Preserve following the completion of the joint three-year “Go Deep” project with EMWP aimed to reduce ungulates to near zero throughout a 12,000 acre area.

Major accomplishments for FY 11 included: 1) Approximately 33 acres surveyed and treated for ginger, with control focusing on interval treatments of previously known hotspots. A 10-acre area was swept surrounding an immature outlier ginger found last year, but no other ginger was found; 2) Gorse cycle in Unit 2 was completed after 7-8 years, treating gorse recruitment over a 17-acre area; 3) Over 721 pines were controlled; 4) Analysis of high resolution aerial imagery from Resource Mapping has been completed and contract deliverables met (using private funds); 5) Two separate trials using low volume foliar spray and Herbicide Ballistic Technology (paintball-gun applied herbicide formulations) were performed on pines, with promising results (using private funds); 6) The Maui Nui PEP Coordinator outplanted 38 *Cyanea horrida* seedlings to augment populations between known locations ; 7) The PEP Coordinator located an additional 6 *Cyanea horrida* populations and three locations of the endangered fern *Asplenium peruviana* var. *insulare*; 8) One forest bird and one invertebrate research studies were conducted and supported by TNC; 9) Five pigs were removed within the Preserve; 10) Eighteen miles of fences in the preserve were inspected and maintained at least quarterly; 11) Five fence improvements and repairs were made to preserve fences, including one major fix on a portion of fence where pig activity was seen inside the Preserve; 12) Fourteen minor fence repairs were made to the Deer Management Unit fence; 13) Ungulate transects in Units 1A, 1B and 2 were annually monitored with zero percent ungulate damage detected; and 14) TNC served on the EMWP Executive Committee and supported funding and watershed activities.

In FY 12, TNC plans to continue to sub-award to Tri-Isle RC&D Council, Inc. to complete the majority of the stewardship activities through EMWP. Management activities will focus on minimizing all ungulate damage through regular control efforts and rigorous fence inspections, and controlling habitat-modifying weeds. This is expected to support a more efficient use of funds over the long term.

KA‘Ū PRESERVE

Landowner: TNC

Managing Partner: TNC

Entered NAP Program: FY 07

TNC’s 3,511-acre Ka‘ū Preserve on Hawai‘i Island protects biologically rich and intact native forest in and near the 68,500-acre Ka‘ū Forest Reserve on Mauna Loa’s southeast flank, one of the largest areas of intact forest land in the State. These forest ecosystems provide sanctuary to 153 endemic plant species (many rare or endangered) and support one of Hawaii’s richest remaining assemblages of endangered forest birds.

In FY 11, through diligent monitoring and regular fence checks, the Ka‘ū Preserve’s nearly 1,200 acre fenced unit remained ungulate-free. Fence rust, accelerated by the high concentrations of VOG, was mitigated. TNC staff worked to enhance public hunting in

the adjacent Ka'ū Forest Reserve by coordinating access through the Preserve, maintaining roads, constructing a hunter shelter, and providing three additional fence step-overs. Infrastructure on the Preserve was improved by replacing tent covers on the remote camp, and replacing tin roofing on the educational chalet and outhouse at Kaiholena. Monitoring and control work on kahili ginger was completed in the Kāhilipali unit, with six acres cleared. Control work continued on the kahili ginger population in the Kī'olokū unit with five acre cleared. Weed survey and control work to remove all high priority weeds was conducted on 54 acres within the Kaiholena unit, where the targeted removal of two isolated patches of night-blooming jasmine totaling 12 acres was also completed. Monitoring and seed collection of rare species continued within the ungulate-free unit. Community outreach and environmental education programs continued with volunteer work days, service learning trips for students, and informational booths at events.

In FY 12, TNC staff will continue to maintain the fence, monitor for ingress animals and remove them whenever detected. Strategies to enhance hunter access to the Ka'ū forest will be implemented, including securing funding to implement a plan to increase public access along the forest edge. A radio repeater will be installed at Kaiholena for increased communications and safety for partners working in the Ka'ū forest. The kahili ginger population in the Kī'olokū unit will be monitored and eliminated, and high priority weeds within the Kaiholena unit will be controlled. In addition, high-resolution aerial photos will be continue to be analyzed to map weeds in the preserve and surrounding forest, and TNC staff will assist partners with the implementation of the TMA's weed management plan. Efforts to build Ka'ū community understanding and support for the preservation of Ka'ū's native forests, and enlist volunteer assistance for preserve management will continue with outreach and education activities.

2. COMPLIANCE WITH CHAPTER 42F, HAWAII REVISD STATUES (HRS), REQUIREMENTS FOR GRANTS AND SUBSIDIES

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.

3. ANALYSIS OF THE PROBLEMS AND ISSUES ENCOUNTERED

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 discernable. Several of the projects funded this year under NAPP 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.

4. STATUS OF PUBLIC HUNTING OPPORTUNITIES

On Moloka‘i, the status of public hunting opportunities varies depending on the preserve. Due to safety concerns and the limited resources for administration and enforcement, TNC does not offer a public hunting program at the Mo‘omomi Preserve. In the event studies indicate that major control work needs to be conducted on the deer population, TNC will pursue management in the best interest of the resources. Kamakou Preserve is open for public hunting when it is compatible with management programs and in accordance with the regulations of the adjoining Pu‘u Ali‘i NAR. At this time, the NAR and the Preserve are open year-round to hunting of pigs, goats, and axis deer, without a bag limit. During times of extreme fire hazard, unsafe road conditions, or herbicide spraying in areas accessible to the public, portions or all of the Preserve may be closed. The Pelekunu Preserve continues to utilize staff-organized volunteer ground hunts through the Moloka‘i Hunting Working Group.

On Maui, the status of public hunting opportunities also varies depending on the preserve. At Pu‘u Kukui, the Preserve is open to public hunters by permit 365 days a year, with no bag limit. Limited volunteer hunting opportunities are available at the Waikamoi Preserve. The conservation easement between TNC and Haleakala Ranch allows ranch employees to hunt. Public hunters willing to follow TNC guidelines will be allowed to hunt in Unit 1A of the Preserve on a limited basis (when hunting will not interfere with ongoing management activities, planned guided hikes, and hunting by ranch employees). However, it should be understood that the goal is to remove all ungulates in the Preserve, and no area within Waikamoi Preserve will be considered a sustained yield hunting area. In addition, there are approximately 50,000 acres available to public hunters below the Preserve to meet public hunting needs. The conservation easement between TNC and Amfac/JMB Hawaii, L.L.C. requires that there be no unaccompanied public hunting in the Kapunakea Preserve. Kapunakea Preserve is closed to hunting with dogs due to an increased snaring effort in the pPreserve due to dramatic increases of pigs in previously hunted areas. However, TNC staff may accompany public hunters hunting without dogs upon request, on a case-by-case basis. Limited public hunting opportunities that will not interfere with other management are available in coordination with scheduled work trips.

On Lana‘i, TNC utilized volunteer hunts as a method to remove remnant deer from the fence enclosure units.

On Hawai‘i Island, TNC will continue to utilize volunteer hunters to reduce animal numbers within the Kau Preserve and will continue to investigate ways to enhance hunter access into Kau forest.

5. FINANCIAL REPORT

NAPP is supported primarily through NARF. In FY 11, state expenditures were \$843,899. As NAPP provides matching funds on a 2:1 basis, these state funds were

matched by at least \$421,450 in private funds. In actuality, NAPP participants typically provide additional matching dollars for conservation, through additional private funds or through acquisition of federal grants.

6. PLANS AND MANAGEMENT OBJECTIVES FOR THE NEXT FISCAL YEAR

NAPP preserve management activities in FY 12 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 rare and endangered species protection, monitoring, research, public education and generating community support. Goals for individual preserves are discussed above.

FINANCIAL CONDITION OF THE NATURAL AREA RESERVE FUND (NARF)

NARF received revenues from the Conveyance Tax (20% of total Conveyance Tax revenues) on real estate transactions. The cash balance of NARF at the beginning of FY 11 was \$6,382,806 with prior year's encumbrances of \$3,262,099. FY 11 NARF revenues were \$9,595,434 with \$9,592,234 from the Conveyance Tax and \$3,200 from miscellaneous (See Table B).

FY 11 expenditures totaled \$6,346,379 representing expenditures of approximately \$3,149,755 of FY 11 encumbrances, \$2,278,211 for FY 10 encumbrances, \$467,597 for FY 09 encumbrances and \$450,816 central services fees. Of the FY 11 allowed spending cap, all operating funds were encumbered. Outstanding FY 11 encumbrances totaled \$3,076,740.

The cash balance of NARF at the beginning of FY 12 is \$6,609,054 with \$3,532,314 as the available cash balance. Projections are for revenues to remain relatively flat in FY 12 due to an uncertain real estate market. Actual Conveyance Tax revenues for the first two months of FY 12 were \$1,666,219, up from FY 11 revenues of \$1,484,065 during the same period.

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

FY 11 transfers totaled \$3,018,338 which were: \$1,596,000 to the Forest Stewardship Fund through direct transfers that included Forest Stewardship Program (\$600,000) pursuant to §247-7, HRS, and forest reserve management (\$996,000); HISC (\$1,330,000); and \$92,338 to DLNR Administrative Services Office (ASO) for an accountant & partial funding of an account clerk and data processing analyst. These expenditures are reported in their respective legislative reports.

FY 12 transfers are expected to total \$3,020,000 and include: Forest Stewardship Program (\$600,000 through direct transfers pursuant to §247-7, HRS; forest reserve management (\$900,000); HISC (\$1,400,000); \$5,000 to the Department of Accounting and General Services/Risk Management for insurance premiums; and DLNR ASO for an

accountant and for clerical support (\$95,000). Please see Table C on page 44 for summary of NARF combined drawdown.

**OTHER PROGRAMS FUNDED BY THE NATURAL AREA RESERVE FUND
(NARF) PURSUANT TO § 247-7, HRS: WATERSHED PARTNERSHIPS
PROJECTS & HAWAI‘I YOUTH CONSERVATION CORPS (YCC)**

1. WATERSHED PARTNERSHIP PROGRAM

The Watershed Partnerships Program is a successful public-private venture responsible for protecting the most important watershed forests of every major mountain on all six 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, this forested sponge slowly releases the water to refill our aquifers, providing the fresh water supplies upon which all residents, tourists, agriculture and industry depends. The Program began in East Maui in 1991 and has now grown to 11 partnerships encompassing over two million acres of public and private lands (one half of the total land mass of the Hawaiian Islands).

In 2005, the Hawai‘i State Legislature authorized the use of NARF to support projects undertaken in accordance with watershed management plans negotiated with private landowners. This allowed partnerships to pursue other federal, county, and private funds by using state funds as leverage. In FY 08, approximately \$3.1 million was allocated from NARF for grants to watershed partnerships. Due to a reduction in the percentage of the Conveyance Tax going to NARF and the decrease in real estate value and sales, in FY 11 only \$1.2 million was available for watershed protection. NARF will provide approximately \$1.6 million to the Watershed Partnership Program in FY 12. A temporary infusion of \$1.2 million in USDA Forest Service ARRA funds helped to sustain some partnership actions in 2010. Additional federal recovery funds were not available in FY 11 but most partnerships utilized remaining funds from the 2010 ARRA contracts. The partnerships leveraged an additional \$5.4 million in 2011 from non-state sources. Matching state funds are crucial to this ability to leverage these monies.

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.

The 11 partnerships are:

Kaua‘i: Kaua‘i Watershed Alliance (144,000 acres)

O‘ahu: Wai‘anae Mountains Watershed Partnership (59,762 acres)

	Ko‘olau Mountains Watershed Partnership (98,737 acres)
Moloka‘i:	East Moloka‘i Watershed Partnership (19,000 acres)
Maui:	West Maui Mountains Watershed Partnership (48,000 acres) East Maui Watershed Partnership (100,000 acres) Leeward Haleakalā Watershed Restoration Partnership (43,000 acres)
Lana‘i:	Lāna‘i Forest and Watershed Partnership (20,000 acres)
Hawai‘i:	Kohala Watershed Partnership (65,500 acres) Three Mountain Alliance (Mauna Loa, Hualālei, Kīlauea (1,160,000 acres) Mauna Kea Watershed Alliance (484,000 acres)

There are over 60 private landowners and 24 public agencies currently involved in partnerships. 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:** feral ungulates like pigs, goats, sheep, mouflon, and deer trample and kill plants, tear up the ground with their hooves, & increase erosion
- **Destructive Weeds:** habitat-modifying invasive species that shade out natives, especially those that are shallow rooted 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 Activities, Accomplishments, and Challenges in FY 11, Plans and Management Objectives for FY 12

Conveyance Tax transfers to NARF allowed DOFAW to award \$1.2 million in grants to the Watershed Partnership Program in FY 11. No additional funding has been received or is expected from AARA. A request for proposals from partnerships for FY 12 funds has not been completed; hence, reports below indicate an interim status of expenditures and work still in progress utilizing 2010 and 2011 grant funds only.

Kaua‘i Watershed Alliance-144,004 total acres

FY 10 ARRA funds:	\$182,000
FY 11 WPP grant (WWPG) funds:	\$161,171
Other leveraged funds:	\$370,158

FY 11 Accomplishments:

- Completed construction of the East Alaka'i Protective Fence (2,000 acres)
- Created a base-camp for management activities
- Installed four pig traps with motion-activate game-cameras within fences
- Installed eight game cameras on main animal trails within fenced areas
- Set up three vegetation and ungulate monitoring transects in and out of the fence (5,000 meters total)
- Removed 65 ungulates from within the Alaka'i fence
- Completed ground-based surveys of priority weeds in 113 acres adjacent to the fence to create a weed-free buffer.
- Removed 150 strawberry guava and 110 Australian tree ferns from this area
- Began the process of updating the watershed management plan
- Inspected and maintained 26,396 feet of fence
- Contracted the construction of the Wainiha Conservation Project Fence
- Removed 2,164 Australian tree ferns using aerial control in Wainiha

Waianae Mountains Watershed Partnership- 144,000 acres

FY 10 ARRA funds: \$ 64,000

FY 11 WPPG funds \$105,495

FY 11 Accomplishments:

- Created digital IDs or signatures for invasive weed species using high resolution aerial imagery
- Conducted meetings and community outreach on feral goat control
- Conducted feral goat surveys from Nanakuli to Ohikilolo
- Conducted fence inspection and weed control at Hono'uli'uli
- Coordinated the Ka'ena Point Advisory Group
- Participated in native plant seed collection and propagation
- Assisted with Pahole weed control trials
- Participated in educational events with Waianae and Kapolei High School
- Conducted weed surveys in the Wai'anae Kai Forest Reserve

Ko'olau Mountains Watershed Partnership – 98,737 total acres

FY 10 ARRA Funds: \$120,000

FY 11 WPPG Funds: \$120,000

Other leveraged funds: \$257,000

FY 11 Accomplishments:

- Finalized an ungulate management plan
- Began planning for watershed fencing in the Northern Koolaus
- Began construction of a fence at Peahinaia
- Removed 25 goats from the Northern Ko'olau population

- Engaged volunteer hunters who donated 130 hours of time
- Removed pigs from the Opaepa fence enclosure
- Obtained high resolution aerial imagery for 39,000 acres of priority watershed
- Surveyed weeds on 358 acres
- Controlled weeds on 189 acres in the southern and central Koolaus
- Treated 7,321 weeds in Poamoho, Laie, and Manana upper watershed areas

East Moloka'i Watershed Partnership – 32,983 total acres

FY 11 WPPG funds: \$125,000

Other leveraged funds: \$440,598

FY 11 Accomplishments:

- Retrofitted 1.6 miles of fence to prevent goats from becoming ensnared
- Removed 514 goats, 44 pigs, and 37 deer from the upper watershed
- Surveyed over 1000 acres for weeds
- Removed over 17,000 individual weeds
- Completed three ungulate surveys
- Goat numbers are showing a noticeable decline
- South slope vegetation is beginning to recover due to goat control

Lāna'i Forest and Watershed Partnership - 20,000 total acres

FY 10 ARRA funds: \$45,000

FY 11 WPPG funds: \$50,000

Other leveraged funds: \$95,000

FY 11 Accomplishments:

- Inspected and maintained Increment one Fence (1800 acres). Removed brush and repaired holes.
- Removed 70 animals (deer and mouflon) from fenced areas
- Installed a one-way gate and wing to provide deer an exit from Increment II
- Began an experiment with using radio-collared judas animals (deer and mouflon)
- Engaged Americorps and YCC interns in conservation work.
- Removed strawberry guava from priority watershed areas with native forest

West Maui Mountains Watershed Partnership – 48,000 total acres

FY 10 ARRA Funds: \$170,000

FY 11 WPPG Funds: \$165,000

Other leveraged funds: \$743,000

FY 11 Accomplishments:

- Captured deer in areas where they previously were not present
- Retrofitted fences to create a higher barrier to prevent deer entry
- Inspected and maintained 12.5 miles of fences – repaired 1700’, replaced a stream curtain
- Conducted aerial surveys for strawberry guava
- Controlled clidemia and silk oak in Wahikuli
- Conducted weed ground sweeps of 26.5 acres
- Removed 22 pigs and three deer from within priority watershed areas
- Conducted four interpretive hikes for the public
- Participated in six community outreach events
- Surveyed eight transects for ungulate sign
- Monitored vandalism by dirt bikers to ungulate fences
- Hosted the Mauka to Makai Watershed Symposium for over 80 participants



West Maui Mountains Watershed - Photo by Air Maui

East Maui Watershed Partnership– 100,000 total acres

FY 10 ARRA Funds: \$220,000

FY 11 WPPG Funds: \$125,000

Other leveraged funds: \$405,000

FY 11 Accomplishments:

- Continued construction of upper Hana Forest Reserve: Phase II Feral Ungulate Control Fence- over one mile additional fence built
- Entered into FY12 management agreement for TNC's Waikamoi Preserve
- Maintained access, hunter check stations and signage for hunting areas in Ko'olau Forest Reserve
- Monitored seven 500m ungulate and weed transects
- Inspected and maintained watershed fences (10,000+ meters)
- Controlled major weed species-
 - Kahili ginger (outlier treatment over approximately 1,000 acres)
 - Pine spp. (outlier treatment over approximately 500 acres)
 - Pampas grass (spot-treatment over approximately 15,000 acres)
- Assisted partners- ICS, TNC, NARS, Haleakalā National Park, Kipahulu Ohana, Leeward Haleakalā Watershed Restoration Partnership with field projects
- Conducted interpretive hikes, informational presentations, fund raisers, and community events reaching over 1,800 Maui residents

Leeward Haleakalā Watershed Restoration Partnership – 43,175 total acres

FY 10 ARRA funds: \$170,000

FY 11 WPPG funds: \$130,000

Other leveraged funds: \$403,562

FY 11 Accomplishments:

- Collected preliminary data from experimental koa exclosures and seed ball trials
- Completed the final 0.26 mi section of fence at Kaupo.
- Completed compliance documents and contracting for the western fenceline portion which will create a 1,023 acres watershed protection area.
- Inspected and maintained 4.5 miles of fenceline at Nu'u Mauka and Kaupō Ranches
- Discovered and removed Australian tree fern, apparently spreading from Kipahulu Valley to the East in gulches near the fence line.
- Observed seedlings of 'ohi'a, pukiawe, and 'u'ulei germinating due to reduced pressure from goats in the area and indicating the potential for natural regeneration.
- Inspected and maintained fencelines at Auwahi, Ulupalakua
- Maintained and controlled weeds in the 33 acres primary restoration area at Auwahi
- Completed primary restoration of 10.2 acres in Auwahi III, with over 7,000 native plants planted.
- Began development of a database to track phenology of rare species to increase propagation numbers.
- Controlled fireweed (*Senecio madagascarensis*) and bocconia (*Bocconia frutescens*) with assistance from volunteers in over eight acres within eastern Auwahi III and along the eastern fence perimeter.

- Nearly finalized the Kahikinui Dept. of Hawaiian Home Lands (DHHL) fenceline. This has been a challenge due to the rough terrain, remote location requiring helicopter access. Biological inventory surveys, seabird surveys, and archaeological surveys have been completed.
- Worked with DHHL and MISC to develop a plan to eradicate gorse (*Ulex europaeus*) from Haleakalā's south slope.
- Launched a control effort following aerial surveys and mapping, using ground-based manual treatment, resulting in 81 populations of this noxious species controlled over approximately 1,000 acres.
- Began developing a plan to map and control bocconia (*Bocconia frutescens*) on DHHL lands. Due to difficult terrain, remote location, and heavy presence of ungulates, many bocconia plants are confined to gulches, making manual and chemical control difficult and dangerous.
- Coordinated a survey of feral cattle at Kahikinui and held an interagency meeting with DOFAW and DHHL regarding population trends and potential control
- Assisted USGS researchers in documenting unassisted reproduction of rare montane dryland tree species, many of which have not reproduced naturally for 50-100 years.
- Assisted USGS researchers in documenting differential hydrological performance of side-by-side comparisons
- Documented an unrecorded and important population of u'au (Hawaiian petrel) burrows at high elevation areas of DHHL-Kahikinui

Three Mountain Alliance – 1,116,300 acres

FY 10 ARRA Funds: \$175,000
FY 11 WPPG Funds: \$169,500

Other leveraged funds: \$509,000

FY 11 Accomplishments:

- Finished reinforcing 3,500m of the Kūlani South Boundary fence north of Stainback Highway. Reinforcement continues along the North Boundary
- Began replacement of Kūlani fencing in the Mauna Loa Boys School unit bordering the Upper Waiākea Forest Reserve
- Controlled 84 feral cattle (66 trapped, 18 killed) in the Honua'ula Forest Reserve including one aerial assisted hunt, three aerial pushes, and 13 staff hunts.
- Conducted five staff hunts for feral cows in the Ka'ū and Kapāpala Forest Reserves
- Expanded the TMA management geo-database to include vegetation survey data, bird survey data, reforestation activities, greenhouse and propagation data, predator control, and rare plant survey and monitoring data
- Inspected and maintained 10,900 acres fenced ungulate-free units-Ola'a/Kīlauea
- Conducted feral animal control on 24,300 acres
- Keauhou Unit (20,000 acres) now free of goats and feral sheep. 163 pigs removed.

- South Boundary Unit (2,000 acres) now ungulate free.
- Wright Rd. Unit (2,300 acres) ungulate free.
- Completed annual forest bird surveys in Kūlani and Keauhou/Kīlauea
- Inspected and maintained Pu‘u Wa‘awa‘a Forest Bird Sanctuary fences protecting a total of 4140 acres, baited pig traps

Kohala Watershed Partnership – 68,000 total acres

FY 10 ARRA Funds: 96,500

FY 11 WPPG Funds: 115,200

Other leveraged funds: \$2,180,000

FY 11 Accomplishments:

- Completed 18 miles of ungulate fencing, feral goat control on 6,600 acres, creation of 400-acre fenced restoration area with 32,000, installation of 90 sediment check dams, and treating about 60 acres with erosion control fabric.
- Completed construction of fencing for Pu‘u Pili Biodiversity Unit; established monitoring protocols for assessment of vegetation recovery.
- Coordinated with the Big Island ISC, UH, landowners, and funders to create a plan and secure funding for eradication of *R. vomitoria* in North Kohala.
- Coordinated science field work for 175 students in 5 schools in North Hawai‘i. Involved more than 300 individuals in a community volunteer program total of 1,600 hours of work for the year.
- Presented ongoing watershed education and project updates to community groups and professional conferences, reaching an audience of more than 1,000 people over the year.

Mauna Kea Watershed Alliance

FY 11 WPPG Funds: \$85,000

FY 11 Accomplishments:

- Hired the new watershed coordinator through the Research Corporation of UH
- Completed the draft management plan
- Applied for funding through the Wildlife Conservation Society and the American Bird Conservancy

Support for Watershed related positions at DOFAW branches

In FY 11, an additional \$20,000 from NARF was allocated to support existing temporary positions to assist with coordination and watershed management on forest reserve, NARS and partnership lands. \$37,500 of ARRA funding was allocated for DOFAW administration of the program and other overhead costs.

FY 11 Challenges

Partnerships are depending more heavily on federal funds but these funds require a non-federal match. Without state funds, these federal funds are not available. Many of the partnerships have already down-sized.

The reduction of Conveyance Tax income threatens to leave partnerships without key funds that have helped to leverage over \$5 million in funds for the protection of Hawaii's watershed forests. Due to the current economic conditions the State's funding has been reduced by 50% since FY 08. If special funds are further affected by legislative action, watershed partnerships will lose the significant ground that has been gained by this important, nationally-recognized program. Forest protection is key to the continued sustainability of our water supplies. Watershed protection through partnerships deserves continued investment through NARF.

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 broad variety of methods to connect with communities across demographics and islands including: website management, press release development, public outreach event participation and coordination, Project Learning Tree educator workshop facilitation, field trip interpretation, classroom visits, and the YCC Program. The summary below details the FY 11 statewide education and outreach initiatives coordinated and staffed primarily by the DLNR-DOFAW information and education coordinator and AmeriCorps education and outreach intern located in the DOFAW Administration office.

The education and information section had just one full time staff person who is supported by interns and the occasional contract hire. In order to develop a fully robust program, more permanent staff is needed. Despite these challenges, DOFAW continues to improve and augment outreach efforts by securing grants and implementing programs that have demonstrated success nationally and resonate with local needs and thereby improves environmental literacy contributing to a more environmentally conscious and sustainable island community.

Youth Conservation Corps (YCC) Program

This year-round program is funded by NARF and supported by federal and community grants awarded to program partner, Kupu. DLNR recruited 30 year-round members as an AmeriCorps program. The program enables young adults to gain entry-level experience as they work alongside natural resource professionals. The program was developed with the intent to provide in-depth training for local youth interested in pursuing a career working in natural resource conservation and management. YCC supports conservation organizations and increases local resource knowledge for Hawaii's youth. The scope of conservation projects include but are not limited to: invasive species management and removal, fencing, information and education, dry forest management, and native species out-planting.

Project Learning Tree (PLT) Program

The DLNR-DOFAW serves as the state coordinator for this national program – a

program of the American Forest Foundation. This program strives to “teach students how to think not what to think about complex environmental issues”. DOFAW staff coordinates and facilitates educator workshops to provide Hawaii’s traditional and non-traditional 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 FY 11 outreach staff coordinated and facilitated five PLT educator workshops and certified an estimated 70 Hawai‘i educators and one active facilitator in PLT on Kaua‘i, Maui, Hawai‘i Island, and O‘ahu. DOFAW also took on the challenge of integrating PLT in university education programs. Staff offered pre-service educator workshops at Chaminade University and Wayland Baptist University and are communicating with educators at Hawai‘i Pacific University as well as those in the UH system.

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



DOFAW information and education staff participated in 15 outreach events in FY11 and had the potential to reach an estimated 11 thousand community members; provided five interpretive service to more than 400 students/residents in various field/service trips on DOFAW lands; provided over 20 classroom presentations to 1418 students at 15 schools; and shared information about programs and plans at seven community meetings for nearly 100 community members. DLNR-DOFAW

supported partners by providing staff on three other interpretive trips reaching approximately 150 additional students. Concerted effort were made to connect with title one schools on O‘ahu by contacting every elementary and middle school and offering our standards-based, experiential presentations to classroom educators.

Hawai‘i Environmental Education Alliance (HEEA)

DOFAW outreach staff successfully applied for Competitive State and Private Forestry funds to coordinate conservation education materials throughout the state and improve cooperation, efficiency, and effectiveness between conservation education partners. Through these funds, the DLNR-DOFAW has worked to improve environmental literacy in the state by re-invigorating HEEA. The advisory council consists of approximately 25 individuals from various sectors including: government, non-profit and for-profit. Quarterly meetings were held July 2010, October 2010, February 2011 & February 2011.



HEEA's mission is to promote and develop high quality environmental education by building relationships to improve networking and professionalism throughout Hawai'i. The vision is an informed and engaged island community that values Hawaii's uniqueness and lives sustainably. Through collaborative teamwork, HEEA is accomplishing these goals in three focus areas:

- Development of the Hawai'i Environmental Literacy Plan (HELP)
- Assessment of existing and needed Professional Development & Capacity Building opportunities
- Understanding Environmental Education Policy and Legislation

The DLNR-DOFAW has been instrumental in supporting the development of HELP including funding the technical writing portion. The goal is to develop a plan that is eligible for federal funds authorized by the Elementary and Secondary Education Act. The plan details actions to will develop an environmentally literate citizenry that will make informed decision about complex environmental issues.

For more information on the organization and the work that has developed as a result of this \$80k grant through DOFAW, please visit www.heea.org.

2011: International Year of Forests

In 2011 DLNR-DOFAW has celebrate the United Nation's designation of International of Forests in many ways. Hawaii kicked off the year with a launch at Halau Ku Mana Public Charter School; developed a "Forest Box" with students, which traveled throughout the US, with the American Forest Foundation and PLT; integrated forest concepts in PLT workshops, and hosted Hawai'i FOCUS.

FOCUS Hawai'i

[FOCUS](#) is a unique partnership launched on June 13, 2009 between the USDA Forest Service, National Ocean and Atmospheric Administration and the Wyland Foundation that inspires water conservation and natural resource appreciation from the forest to the sea. This year national coordinators decided to host the fun and innovative program in Hawai'i with support of local sponsor and coordinator, the DLNR-DOFAW. FOCUS empowers young people to become clean water ambassadors working within their communities to foster long-term natural resource conservation efforts. Through FOCUS's concepts of study, exploration, and celebration, students and community gain a comprehensive understanding of water management, climate and the importance of sustainable ecosystems in everyday lives. Students across the State of Hawai'i have painted 16 murals representing their connections to Hawaii's unique natural and cultural resources.

Web, Social Networking, and Traditional Media

DOFAW information and technology staff maintain the DOFAW website:

<http://hawaii.gov/dlnr/dofaw> and continue to facilitate transitions that staff host on other websites as appropriate in addition to maintaining the environmental education blog: <http://www.eenhawaii.blogspot.com/>.

Staff develops press releases; coordinate media support (b-roll, photos, etc.) as able and maintain a social networking presence by addressing the DLNR's Public Information Office with of-interest details to be "tweeted" via Twitter.

CONCLUSION

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

Native Ecosystem Section Manager
Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813
Telephone: 587-0054
Fax: 587-0064

E-mail: randall.w.kennedy@hawaii.gov

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

**LNR 407 NATURAL AREAS MANAGEMENT BUDGET SUMMARY FY
FISCAL YEAR 2011**

Table A: FY 11 NARS Expenditures (General Fund Appropriation G-11-047)

	Total = \$609,191
NARS 'A' Personnel Expenditures FY 11 =	\$556,264
NARS 'B' Operating Expenditures FY 11 =	\$52,927

FY 12 NARS Allocation (General Fund Appropriation G-12-047)

	Total = \$ 740,197
NARS 'A' Personnel Allocation FY 12 (19* positions) =	\$675,054
NARS 'B' Operating Allocations FY 12 =	\$65,143*

* Administrative spending restriction of \$50,000

Table B: NAR Fund Revenues FY11 (S-11-342)

Source	Timeframe	Amount
FY 11 Conveyance	7/1/2010 – 6/30/2011	\$9,592,234
Tax transfers		
Investment pool	7/1/2010 – 6/30/2011	\$0
revenues		
Other	7/1/2010 – 6/30/2011	<u>\$3,200</u>
Total Revenues =		\$9,595,434

Table C: FY11 NAR Fund Drawdown (Special Fund Appropriation S-11-342)

	Total = \$9,364,717
NARF 'A' Personnel Expenditures	= \$1,360,347
NARF Operational Expenditures/Encumbrances	= \$4,986,032
Transfers Out	= \$3,018,338

FY 12 NAR Fund Allocation (Special Fund Appropriation S-12-342)

	Total = \$10,611,081
NARF 'A' Personnel Allocation	= \$1,857,485
NARF Operational Allocation	= \$5,733,596
Transfers Out	= \$3,020,000