

KAUA'I WATERSHED ALLIANCE

Management Plan Update

Overall Management Strategy

April 2012



Table of Contents

KWA 2012 Management Plan Update	3
Watershed Protection Plan 2012-2017	5
Ungulate Management:	5
Budget – Feral Ungulate Control FY 13 – FY17	6
Budget – Feral Ungulate Control FY 18 – FY 22.....	7
Weed Management:	7
Budget – Invasive Weed Control FY13 – FY 17	8
Budget – Invasive Weed Control FY 18 – FY 22.....	9
Summary	9

KWA 2012 Management Plan Update

The Kaua‘i Watershed Alliance formed in 2003 with the objective “to protect, preserve and manage our valuable watershed resources for the benefit of our residents, communities and all future generations through the concerted efforts of its members”. The KWA’s members found common cause in their desire to protect the forested watershed from threats posed by feral animals and invasive weeds. To that end, the KWA obtained assistance from The Nature Conservancy (TNC) to develop a management plan aimed at protecting Kaua‘i’s vital watershed resources from the most urgent threats. The Nature Conservancy completed the plan in 2005, at which time the KWA asked the TNC to coordinate implementation of the management actions identified in the plan.

The Nature Conservancy’s (TNC) 2003 resource inventory identified those areas on Kaua‘i with the greatest ability to capture and retain precipitation. Analyses conducted in these areas identified key threats to the structure and function of the forest, as well as four specific management actions that would be the cornerstones of successful watershed conservation on Kaua‘i:

1. Construct protective fences to isolate ungulate populations
2. Maintain fence integrity
3. Control non-native ungulates inside the fences
4. Control invasive weed species

The Nature Conservancy’s has focused on accomplishing those four basic actions throughout the past eight years of KWA coordination. They have used the best techniques currently available to control non-native animals and weeds, while also developing new, more effective, less expensive ways to meet those objectives. Challenges posed by remote work locations, rugged terrain, plant and animal reproductive abilities, and limited staff necessitate innovation. Major accomplishments include:

- Construction of approximately 6.5 miles of protective fence, to creating ungulate management units on the Alaka‘i plateau, in Wainiha valley, and at Kanaele bog



Lush native forest lines Halepaakai stream on the Alaka‘i plateau

These fences work in conjunction with natural barriers to isolate animal populations in over 5,000 acres of high priority watershed.

- Controlling priority, habitat modifying, invasive weed species throughout over 11,000 acres with a combination of manual and aerial methods.
- Development of an innovative large-landscape survey method. TNC worked in partnership with Resource Mapping Hawaii LLC to create a system capable of detecting individual weeds utilizing ultra-high resolution aerial imagery.

Today, the KWA is perfectly positioned to build on past success, capitalize on current opportunities, and make even greater progress toward its goal of preserving Kaua'i's water resources for future generations.

In November of 2011, The State of Hawai'i's Department of Land and Natural Resources (DLNR) unveiled a new plan calling for a dramatic increase in the protection and conservation of our state's freshwater resources. This plan, "The Rain Follows the Forest" or "*Hahai no ka ua i ka ululā`au*", states that, "fresh, clean water is an irreplaceable resource. It is fundamental to our well-being. It fuels agriculture, tourism, and sustainable development. In turn, our water supply depends on the health of our mauka native forests, which capture and absorb rain". The plan goes on to call for a doubling in the amount of Hawai'i's priority watershed areas



Mauka forests capture and absorb Kauai's rainfall

managed for watershed protection in the next ten years. This goal envisions the fencing of approximately 90,000 acres of priority watershed, accompanied with ungulate removal and weed control efforts. Furthermore, the plan calls for the fencing and management of 25,000 acres on Kaua'i in the next 10 years; an ambitious goal. The Kaua'i Watershed Alliance (KWA) views this challenge as an opportunity to address watershed conservation on at a scale that had previously seemed out of reach. This plan presents options, and cost projections, for achieving the full 25,000 acre goal in the next ten years.

Watershed Protection Plan 2012-2017

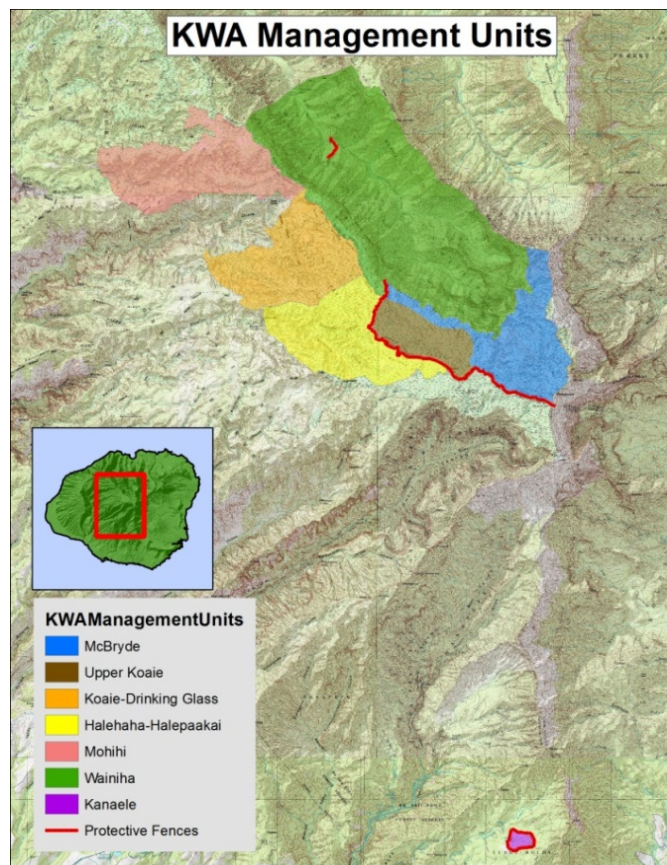
TNC will continue to focus on abating the primary threats to forest integrity and watershed function, and broaden the scope of their efforts beyond the current 5,000-acre fenced area. The next five years of watershed protection will entail maintaining and monitoring existing fenced units, developing new technologies to improve management efficiency and effectiveness, and expanding watershed protection to new priority areas to meet the 25,000-acre goal set in the Rain Follows the Forest Plan.

Ungulate Management:

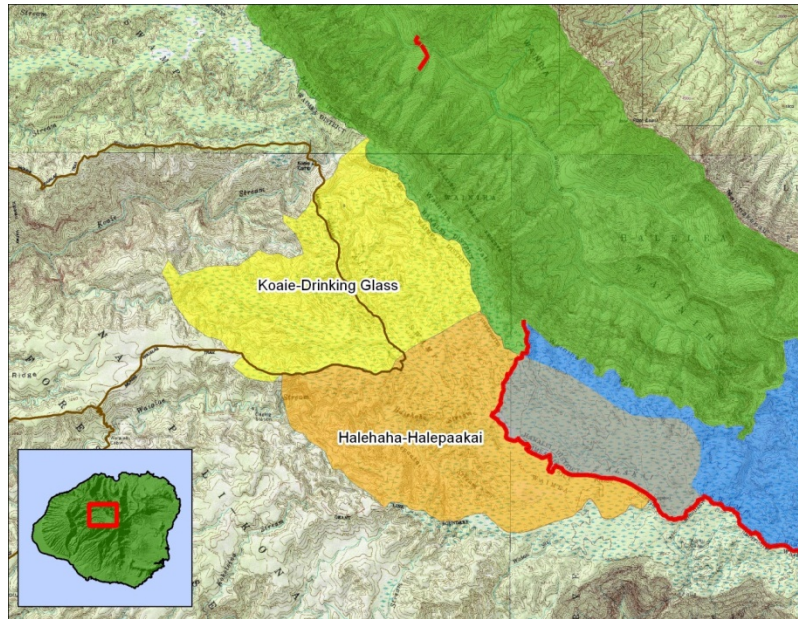
Goal: Remove ungulates from all of the KWA's existing fenced units, construct new fences in priority areas and remove ungulates, and respond to ungulate ingress as needed.

TNC will continue to remove ungulates and maintain ungulate-free fenced areas in the 2,000 acres on the Alaka'i Plateau and 3,000 acres of the Upper-Wainiha Valley. TNC employs a variety of methods to remove all pigs and goats from fenced units, including trapping, staff and volunteer hunting, snaring, and other control methods as they are developed. TNC will continue maintaining the 1.5-mile Kanaele Fence, 4.5-mile Alaka'i Fence, and .5-mile Wainiha Valley Fence (map 1) and monitoring for ingress in all fenced units. TNC monitors using activity transects, game cameras, and aerial surveys.

Going forward, TNC will work with Kaua'i DOFAW, NARS, and other KWA partners to expand watershed protection to include additional areas in the State Alaka'i Wilderness Preserve. TNC proposes to construct and remove ungulates from approximately 3,600 acres of new fenced areas in the Halehaha –



Map 1



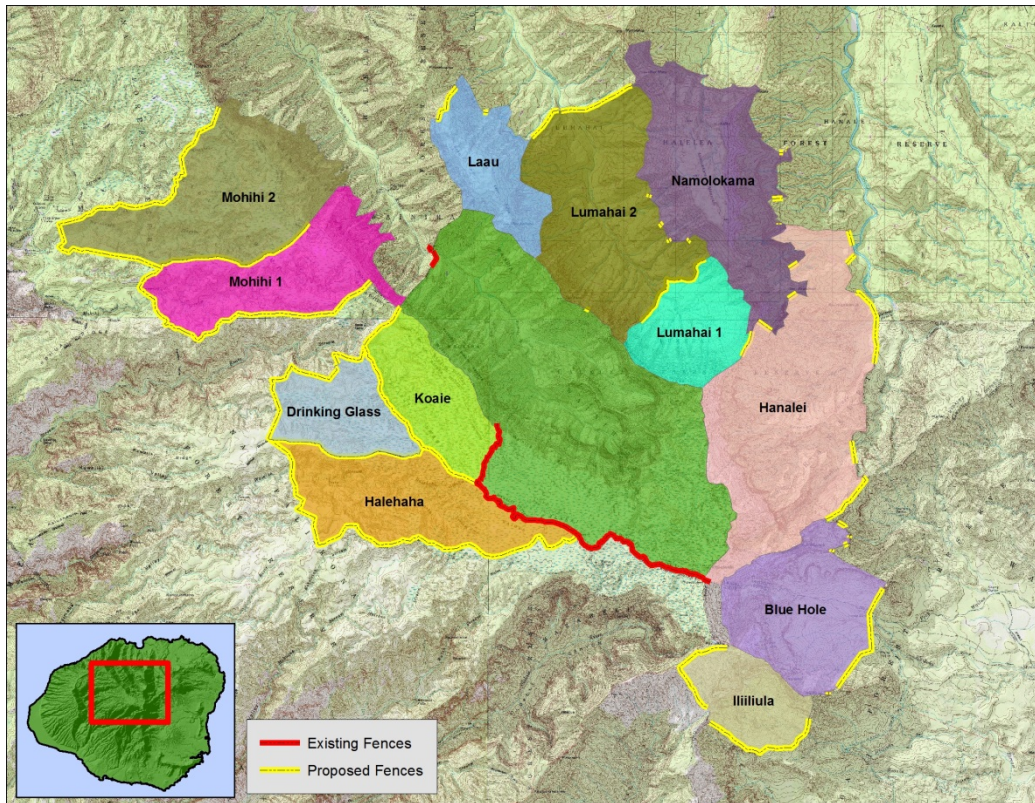
Map 2

Halepaakai and Koaie - Drinking Glass management units (map 2) by 2017. These areas contain some of the most intact, native-dominated forest remaining on Kaua'i. These units also serve as critical rainfall and cloud drip catchment areas, providing water recharge for streams that feed the Waimea River system.

Budget – Feral Ungulate Control FY 13 – FY17

	FY13	FY14	FY15	FY16	FY17
Fence Maintenance	\$85,333	\$95,667	\$111,000	\$121,333	\$153,000
Fence Construction	\$110,333	\$653,412	\$1,585,130	\$559,543	\$1,224,915
Ungulate Control	\$271,333	\$310,667	\$341,000	\$381,333	\$643,000
Total Ungulate Control	\$467,000	\$1,059,745	\$2,037,130	\$1,062,210	\$2,020,915

In 2017, TNC will begin building fenced units and removing ungulates from approximately 17,000 acres of additional high-priority watershed forest as identified in the State's plan. These areas include Mohihi in the Alaka'i Wilderness Preserve, Upper-Lumahai and Laau Plateau, Namolokama Plateau and Upper-Hanalei, Blue Hole & Iliiliula. These additional units would bring the total protected acres to approximately 25,000.



Budget – Feral Ungulate Control FY 18 – FY 22

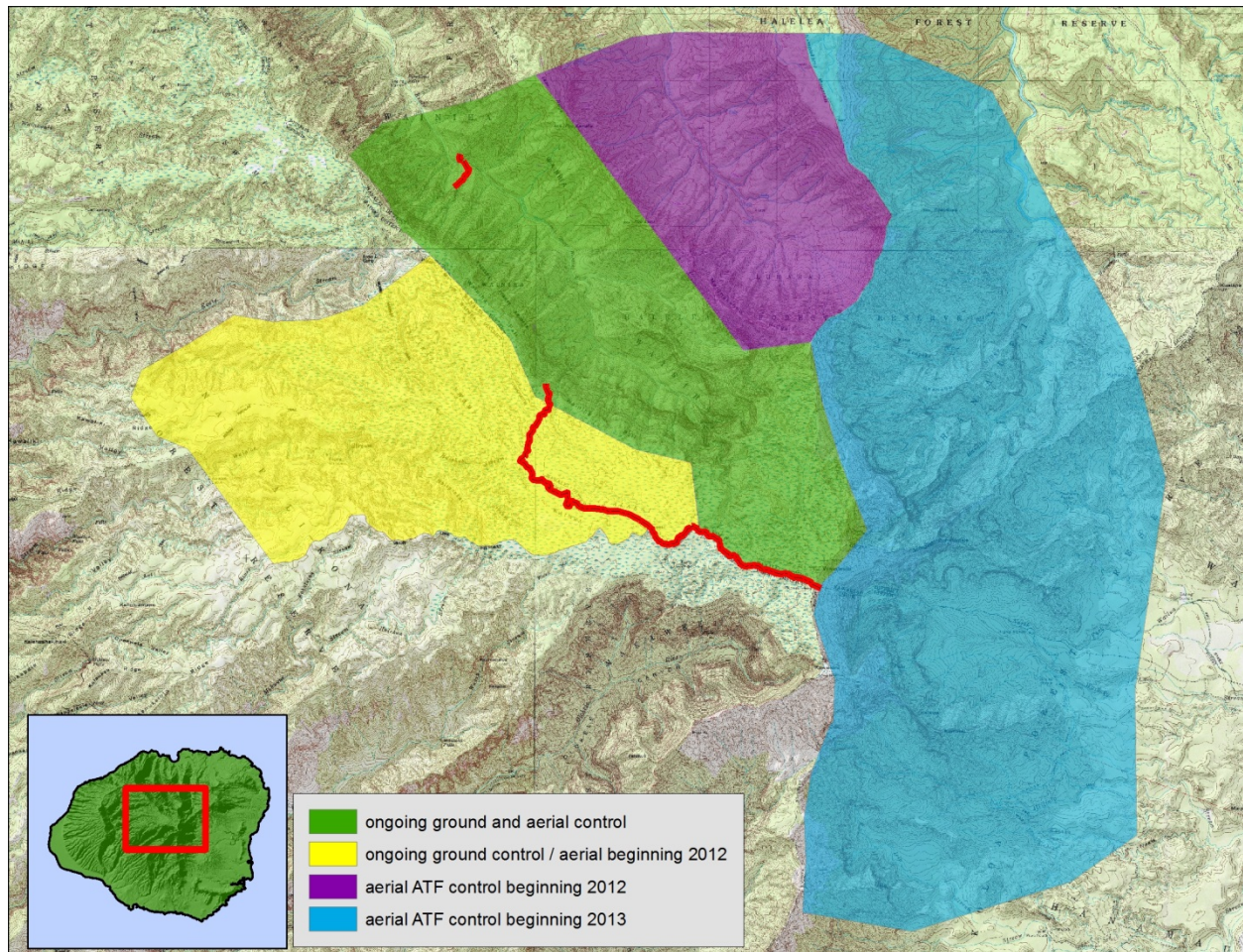
	FY18	FY19	FY20	FY21	FY22
Fence Maintenance	\$178,333	\$198,333	\$242,000	\$282,000	\$302,333
Fence Construction	\$1,040,018	\$670,648	\$765,120	\$483,110	\$642,393
Ungulate Control	\$813,333	\$923,333	\$1,102,000	\$1,117,000	\$1,207,333
Total Ungulate Control	\$2,031,685	\$1,792,315	\$2,109,120	\$1,882,110	\$2,152,060

Weed Management:

Goal: TNC will continue to manage habitat modifying invasive plants according to the specific objectives designated for the individual managements units, develop and refine new weed control and mapping technologies, map and monitor progress, and detect new weed invasions.

Existing weed management actions within priority areas will continue, albeit at a lower intensity due to reduced weed densities. Weed control will entail manual and aerial methods using approved herbicides. The priority species for control are strawberry

guava, Kahili ginger, and Australian tree fern (ATF). This list may expand to include *Buddleia asiatica* and *Clidemia hirta*, as well as other habitat modifying weeds as they become problematic. TNC will also expand weed control into currently unmanaged priority areas designated in the ungulate management section of this plan.



Budget – Invasive Weed Control FY13 – FY 17

	FY13	FY14	FY15	FY16	FY17
Weed Control: Aerial	\$352,000	\$232,333	\$242,667	\$173,000	\$166,333
Weed Control: Ground	\$112,000	\$102,333	\$122,667	\$133,000	\$186,333
Weed Monitoring	\$114,000	\$114,333	\$114,667	\$125,000	\$138,333
Total Weed Control	\$578,000	\$449,000	\$480,000	\$431,000	\$491,000

Budget – Invasive Weed Control FY 18 – FY 22

	FY18	FY19	FY20	FY21	FY22
Weed Control: Aerial	\$196,667	\$336,667	\$392,833	\$417,833	\$303,167
Weed Control: Ground	\$236,667	\$211,667	\$255,333	\$255,333	\$265,667
Weed Monitoring	\$148,667	\$158,667	\$172,333	\$172,333	\$172,667
Total Weed Control	\$582,000	\$707,000	\$820,500	\$845,500	\$741,500

Summary:

The Rain Follows the Forest plan is both a daunting challenge and a golden opportunity. Full implementation of the plan, and protection of 25,000 acres in the next ten years, will require a substantial scaling-up of resource management capacity on Kaua‘i. Protective fences for the units described above would need to be constructed in rapid succession. Fenceline surveys, weed control, and animal removal would need to occur across several management units simultaneously, with much of the work being contracted to specialist organizations. Development of new technologies will help with these efforts, and close collaboration with partners and contractors will be essential to achieve watershed protection goals. With the Governor’s mandate, dedicated funding, and the support and cooperation of the KWA membership, Kaua‘i’s watershed can be conserved at a scale that would otherwise be impossible.