

KO'OLAU MOUNTAINS WATERSHED PARTNERSHIP



Feral Ungulate Management, Ko'olau Range, O'ahu

Final Report

November 1, 2014 – December 31, 2015

to

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

from

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Introduction

Feral goats (*Capra hircus*) are among the most harmful invasive species on oceanic islands, including Hawai'i. They are notorious for destroying vegetation, increasing erosion, and thriving in a range of habitat types. Females can produce up to 4 offspring a year through frequent twinning. Naturalized populations are known from only two locations in the Ko'olau Mountains of O'ahu, both on the windward side.

A population of feral goats has been growing on the ridge behind the Oceanic Institute and Sea Life Park at Waimanalo for several years; the animals are likely the descendants of escapees from nearby farms. It was reported in 2012 that mouflon sheep (*Ovis musimon*) were also present in the area. The first control shoot took place in April, 2013, with Department of Land and Natural Resources (DLNR) shooters and the Ko'olau Mountains Watershed Partnership (KMWP) providing spotters and keeping the general public out of the area. The last mouflon sheep at Waimanalo was sighted and removed in 2014 and wild sheep are considered eradicated from O'ahu.

The second population of feral goats in the Ko'olau is at Kualoa Ranch, an area that still supports native forest and several endangered species. The total range of the animals is currently estimated at ~400 acres. Feral goats have been controlled at Kualoa Ranch since 2009, with joint efforts by KMWP, Division of Forestry and Wildlife (DOFAW), and volunteers. There was an interruption in the work in 2011-12 that allowed the population to bounce back from a significantly reduced status. KMWP resumed the work in 2013.

In 2015, The Hawaii Invasive Species Council (HISC) provided KMWP with funds to initiate eradication work for the feral goat populations at Kualoa Ranch and Waimanalo. This report summarizes the first year's results of our shooting and trapping efforts.

Control Summary

A total of 1206 hours were spent between November 1, 2014 through December 31, 2015 controlling feral goats at Waimanalo and Kualoa ranch. 74 goats were removed from Waimanalo and 34 from Kualoa ranch from a combined effort of 57 trips. Shooting proved to be the most effective method of control. Hunting party size alternated between two staff consisting of a shooter and spotter, and larger group hunts with DOFAW. Goat populations at Kualoa and Waimanalo appeared to steadily decrease in 2015 as a result of collaborative hunts (see Figure 1). Hunts conducted in the last quarter of the calendar year yielded the control of one goat at each site. We estimate that the remnant feral goat population levels to be at ~1 at Waimanalo and ~ 2-4 at Kualoa ranch.

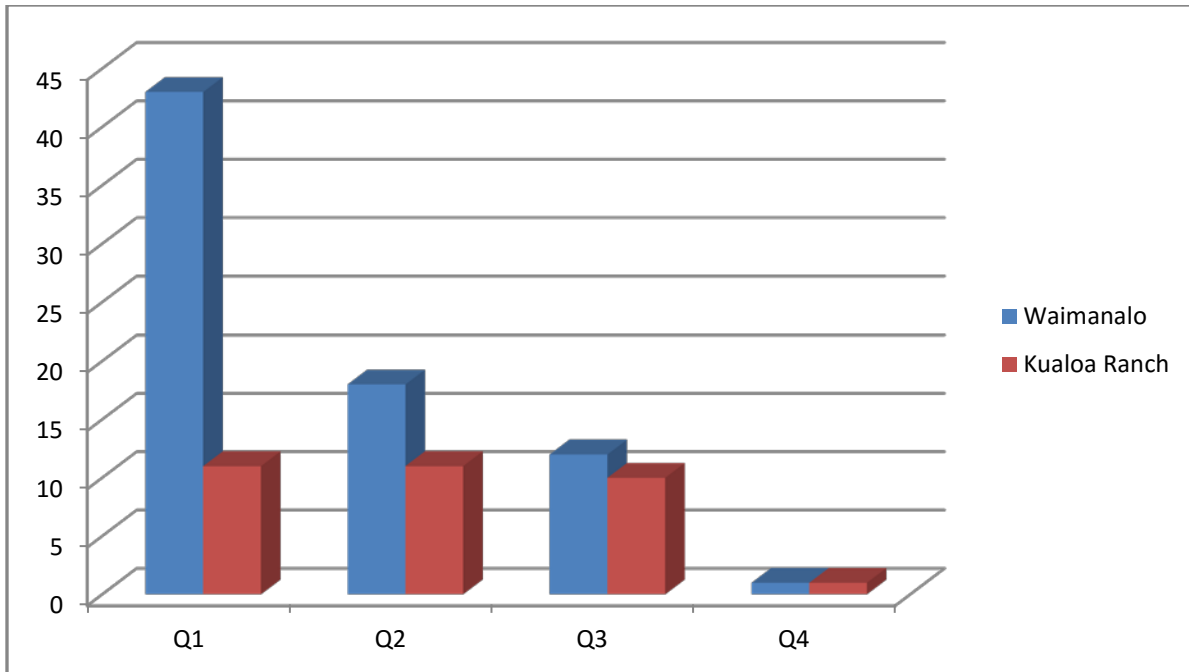


Figure 1. Goats controlled in 2015 at Waimanalo and Kualoa ranch.

Waimanalo Status Report

A total of 169 feral goats and 20 mouflan sheep have been removed from Waimanalo since the project began in 2013. Since HISC began supporting the project in January 2015, 74 goats have been removed from this site (See Figure 2). Five photo points were established in areas of high goat activity to monitor vegetation change before and after control efforts. Three game cameras were placed in areas where goats have been frequently sighted in the past and are continually monitored to insure no goats remain. Since the removal of a goat on November 3rd, scouting trips and game cameras have resulted in no additional goat sightings.

Lessons Learned at Waimanalo

Because Kamehame Ridge is popular with hikers who may access the area from different points (despite “No Trespassing” signs at some entries), extra staff must participate in each shoot to prevent the public from entering the control area during operations. Signs were posted the day before each shoot regarding trail closure due to management operations in progress. In an interesting collaboration, KMWP has been communicating with hang gliders who launch from Kamehame Ridge and have an excellent view of much of the area. Reports from the hang gliders supplement ground recon trips.

Next Steps

We are growing increasingly confident with the most recent scouting trips that the Waimanalo goats are at remnant levels, ~1 or less. This is confirmed by the most recent report from the hang gliders that frequent the area. Our strategy for the near future is to continue to scout, by foot and air, and monitor the game cameras to confirm whether any goats remain in Waimanalo. Additionally, 2 more game cameras will be placed in the field and one aerial survey will be conducted. Once no individuals are encountered on six consecutive trips, extensive ground surveys will commence to confirm that the goats have been fully eradicated.

During 2016, photo points will be reimaged to track vegetation change over time. Forward looking infrared (FLIR) survey methods will also be utilized to monitor for the continued presence of feral goats at Waimanalo.

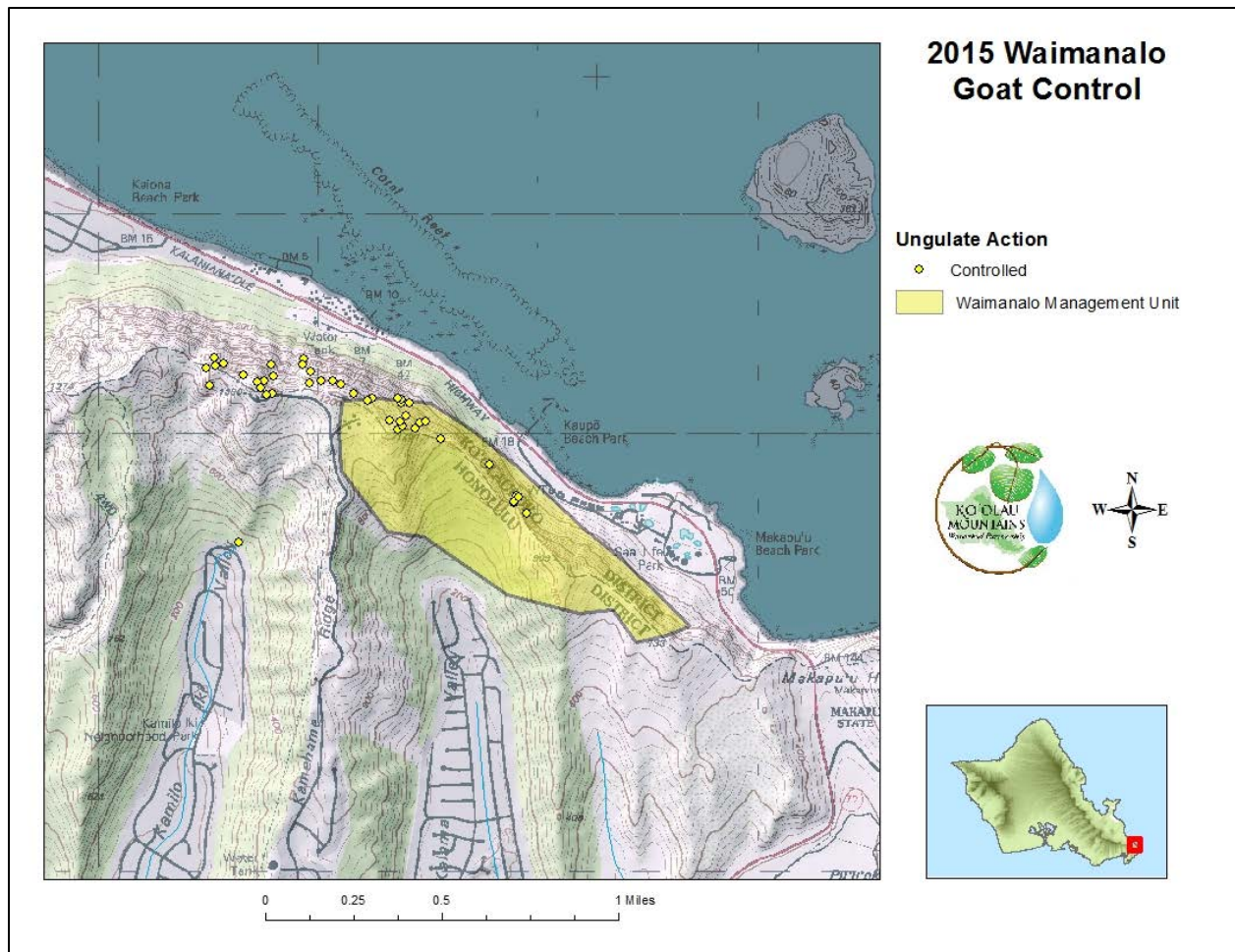


Figure 2. 2015 feral goat control locations at Waimanalo

Kualoa Ranch Status Report

KMWP resumed feral goat control at Kualoa ranch in 2013 and has since removed 68 goats through a combination of trapping and shooting. Six goats were removed in 2013, 29 in 2014, and 33 in 2015 (See Figure 3). KMWP staff deployed 150 snares at Kualoa in 2015 to assist in control efforts (Also see Figure 3). In addition, two photo points were established to monitor changes in vegetation cover following goat removal.

Lessons Learned at Kualoa

This population has different challenges than the goats in Waimanalo. The remote location necessitates helicopter access for most operations, and offers more limited visibility. However hunting success has been increasing as we have been able to deploy more effort, particularly since the hire of our ungulate manager and a part-time hire who is specifically assigned to this location.

Next Steps

Aerial shooting for goats at Kualoa Ranch has been discussed but may be unnecessary at this point. We estimate that 2-4 feral goats remain at Kualoa. We are optimistic that all the remaining animals will be removed in 2016 through bi-monthly snare checks and the continuation of ground hunts.

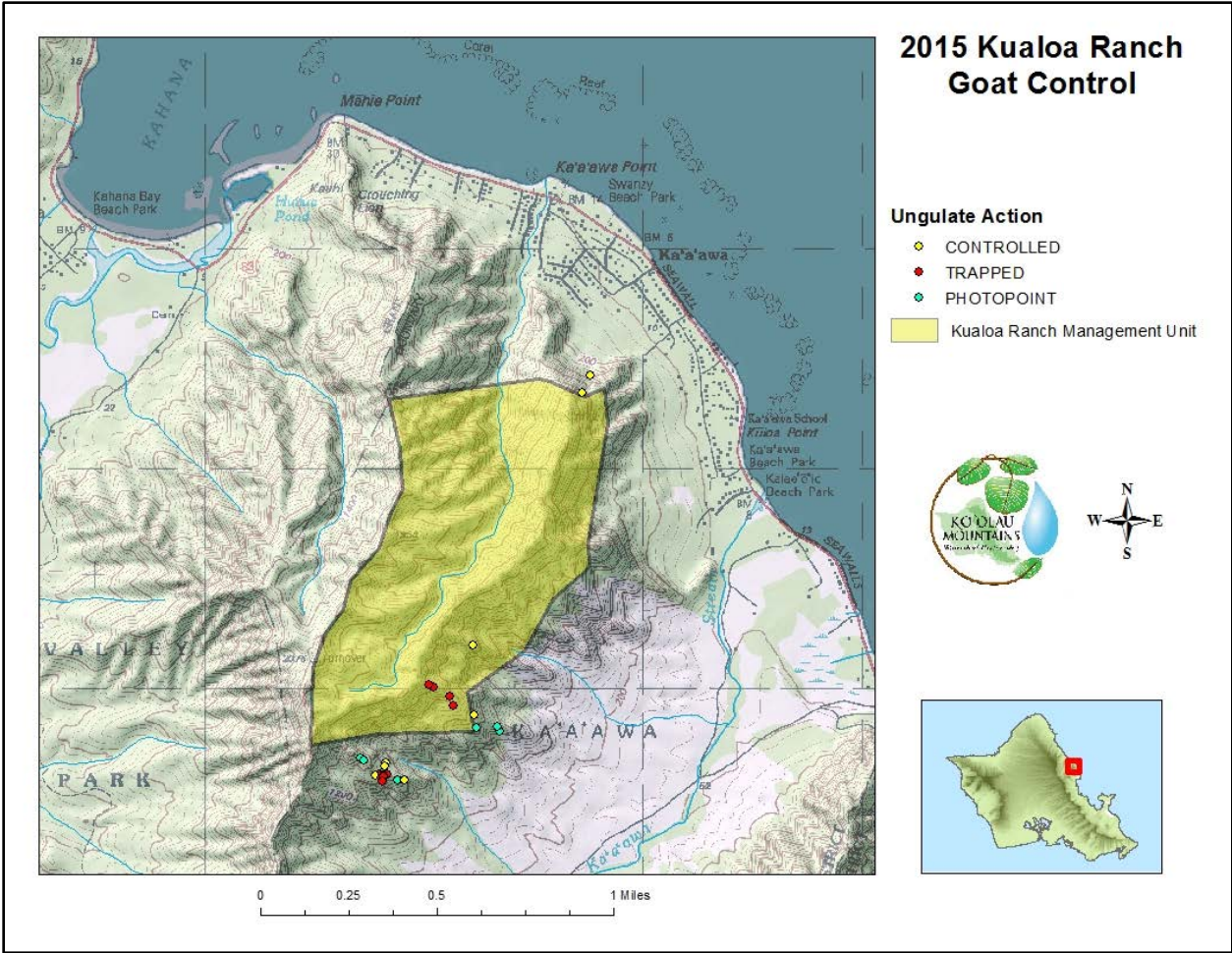


Figure 3. 2015 feral goat control locations at Kualoa ranch.