OPERATIONAL MANAGEMENT PLAN

NONNATIVE PLANT CONTROL AND REMOVAL

FOR THE SUMMIT PLATEAU

MT. KA'ALA NATURAL AREA RESERVE

June 1987

Natural Area Reserves System
Department of Land and Natural Resources
State of Hawaii

OPERATIONAL MANAGEMENT PLAN

NONNATIVE PLANT CONTROL AND REMOVAL FOR THE SUMMIT PLATEAU, MT. KA'ALA NATURAL AREA RESERVE

A plant survey of the Mt. Ka'ala summit plateau (Natural Area Reserves System, 1987), identified nine species of nonnative plants as being the most threatening to the plateau's native shrub forest. The nine species are clidemia (Clidemia hirta), Maui pa-makani (Eupatorium adenophorum), Hamakua pa-makani (Eupatorium riparium), tea tree (Leptospermum scoparium), koa haole (Leucaena leucocephala), kikuyugrass (Pennisetum clandestinum), waiawi (Psidium cattleianum), blackberry (Rubus penetrans), and montbretia (Tritonia crocosmiflora). This operational management plan is based on the management assessment and recommendation given for each of the nine species in the survey report.

They can be sorted into three categories based on such things as abundance, distribution, growth habit, and site adaptation.

Category	Infestation Type	Action to Take
1	Incipient	Immediate removal
2	Expanding	Develop removal plan and implement
3	Confined	Develop monitoring plan and implement

CATEGORY I

Six species are in this group: clidemia, Hamakua pa-makani, tea tree, koa haole, waiawi, and montbretia. Removing them from the summit plateau is a relatively easy task while they are still in small isolated populations.

With the possible exception of montbretia, they are also present downslope of the summit. With that ready seed source, periodic monitoring is essential, especially at open, disturbed areas.

The source of any montbretia infestation is probably those cultivated at the radar dome facility. Populations existing outside of the facility but not actually within the reserve are located on the slope south of the first radar dome and at the helicopter pad.

A. Clidemia, Hamakua pa-makani, tea tree, koa haole, and waiawi

1. Method

These five species are to be removed as soon as seen. The plants are to be pulled up or, if too large, cut off as close as possible to ground level and the stump treated with concentrated Roundup (glyphosate). The site of the infestation is to be mapped for follow-up monitoring.

2. Materials

2 pruning shears

2 (folding) pruning saws

1 qt. Roundup

2 hand-held spray bottles

3. Man-days

4 Man-days at 6 month intervals

B. Montbretia

1. Method

Successful elimination of this plant requires digging out the underground stems, or corms, the only way this sterile hybrid can reproduce. Follow-up checks should be made at 6 month intervals until there is no resprouting. The FAA should be contacted about possibly eradicating the montbretia plants from the flower bed at the radar dome facility. Short of eradication, the cooperation of personnel at the facility in preventing the escape of Tritonia is important.

2. Materials

120' of 1.5" climbing rope

2 grass clippers

2 weeders

1 doz. heavy duty trash bags (3-4 mil)

3. Man-days

a. Initial eradication

6 man-days

b. Monitoring

1 man-day at 6 month intervals until corms are completely eradicated

CATEGORY II

Only blackberry falls in this group. Eradication work should focus first on Priority 1 areas (see table). Priority 2 areas have blackberry growing amidst native species, which poses a problem both in removal technique and getting to the infestation. Eradication should start with those blackberry plants within 3 ft. of each side of the bog trail, 6 ft. of each side of the roads, and adjacent to the radio tower site. A summary of the areas designated for eradication:

Priority	Type of Infestation	Initial Number of Acres to Eradicate
1	heavy infestation (greater than 50% cover)	0.7
1	moderate infestation (26-50% cover)	0.3
2	light infestation (11-25% cover)	0.9
2	very light infestation (1-10% cover)	0.8
		2.7

1. Method

   a. Clear heavy blackberry growth by cutting canes to less than 1' high.

   b. Allow 3 to 4 weeks for regrowth to reach recommended stage for herbicide application, i.e., new leaves fully expanded.

   c. Apply Roundup with backpack sprayer using low pressure, coarse spray.

   d. Monitor to determine spraying effect and, if necessary, when to respray.

The work should take place in incremental sections by clearing a portion of blackberry and returning 3 to 4 weeks later to spray.

The Nature Conservancy has found that 50% solution of Roundup is effective on blackberry. However, lower concentrations such as 1:2 (33% solution) may also be effective. (Current price for Roundup is $130.00/gal).

100 gallons of the 1:1 solution should be sufficient to cover the 2.7 acres as it involves spot spraying rather than uniform coverage spraying.

2. Equipment and materials

a. Equipment

1 gas-powered trimmer

2 backpack sprayers (plastic)

b. Materials

2	pruning shears
2 prs.	leather gloves
1	fire rake
2	face shield
50 gals.	Roundup
5	5-gal. water containers (plastic)
1	measuring cup (plastic)
1	funnel (plastic)
2	rainsuits (rubberized)
2 prs.	rubber boots
2 prs.	heavy duty rubber gloves

2	goggles (or wrap-around safety glasses)
2 doz.	dust masks
6 rolls	flagging tape
2 doz.	aluminum tags

3. Man-days

90 man-days

CATEGORY III

Kikuyugrass and Maui pa-makani are in this group. A monitoring plan should be designed to determine whether their populations are increasing or other areas are being infested. The monitoring program should be for at least two years.

A. Kikuyugrass

1. Method

Establish two permanent monitoring stations, each consisting of 2 metal rods placed roughly 15 to 20 ft. apart, and running close to and parallel with the boundary of the grass mat. At 6-inch intervals between the two markers, periodically measure the distance from the line of the two metal markers to the edge of the grass mat (Figure 1).

2. Materials

4	metal rods (6 ft. long rebars)
1	pole driver
4	aluminum tags
1 roll	flagging tape

2 fiberglass measuring tapes

1 T-square (large)

1 yardstick

3. Man-days

a. Set up monitoring sites and initial data collection

1 man-day

b. Periodic data collection

1/2 man-day at 6 month intervals for two years

B. Maui pa-makani

1. Method

Set up three photo monitoring stations. A compass reading should be taken so that the photographs will always be taken in the same direction.

2. Equipment and materials

a. Equipment

1 35-mm camera

1 compass

b. Materials

1 roll flagging tape

3 aluminum tags

4 rolls slide film

3. Man-days

a. Set up stations and initial photographs

1/2 man-day

b. Periodic monitoring

1/2 man-day at 6 month intervals for two years

EQUIPMENT AND MATERIALS

MASTER LIST

Equipment

1	35-mm camera
1	compass
1	4-wheel drive truck
1	gas powered trimmer
2	backpack sprayers (plastic)

Materials

2	pruning shears
2	(folding) pruning saws
50 1/4 gals.	Roundup
2	hand-held spray bottles
1	1/2" x 120' climbing rope
2	grass clippers
2	weeders
1 doz.	heavy duty trash bags (3-4 mil)
4	metal rods (6 ft. long rebars)
1	pole driver
31	aluminum tags
8 rolls	flagging tape
2	fiberglass measuring tapes
1	T-square (large)
1	yardstick
4 rolls	slide film & processing
1	fire rake
2	face shield
5	5-gal. water containers (plastic)
1	measuring cup (plastic)
1	funnel (plastic)
2	rainsuits (rubberized)
2 prs.	rubber boots
2 prs.	heavy duty rubber gloves
2	goggles (or wrap-around safety glasses)
2 doz.	dust masks
2 prs.	leather gloves

B. Maui pa-makani

1. Method

Set up three photo monitoring stations. A compass reading should be taken so that the photographs will always be taken in the same direction.

2. Equipment and materials

a. Equipment

1 35-mm camera

1 compass

b. Materials

1 roll flagging tape

3 aluminum tags

4 rolls slide film

3. Man-days

a. Set up stations and initial photographs

1/2 man-day

b. Periodic monitoring

1/2 man-day at 6 month intervals for two years