THE USE OF VOLUNTEERS FOR ALIEN PLANT CONTROL AT HAWAII VOLCANOES NATIONAL PARK AND THE NATURE CONSERVANCY'S KAMAKOU PRESERVE

J. Timothy Tunison and Edwin T. Misaki

ABSTRACT

Hawaii Volcanoes National Park on Hawai'i Island and The Nature Conservancy of Hawai'i Kamakou Preserve on Moloka'i require labor-intensive management of alien plant species beyond the level available from paid staff. Volunteers are used to make up part of the worker shortfall and have made significant contributions in both areas. Kamakou Preserve has focused on developing a program that depends primarily on volunteers. Hawaii Volcanoes has a more extensive program relying mainly on paid staff. The level of volunteer participation differs because of differences in size of the alien plant control programs, remoteness of the areas, and organizational objectives. Volunteers are most productive when simple control treatment methods are used for readily recognizable alien plants located in localized areas. Motivation is highest in situations in which progress can be observed, and where work on alien plant projects is followed by hiking and other kinds of outdoor enjoyment.

INTRODUCTION

The maintenance and restoration of native ecosystems in preserves of The Nature Conservancy of Hawaii and in the national parks require intensive management of alien plants. Protected areas often contain some of the most undisturbed native vegetation in Hawai'i, but preserves and parks also support increasing populations of alien plant species. Introduced species degrade native plant communities, and some alien plant species threaten to completely alter native ecosystems (Jacobi and Warshauer, this volume). Removal of feral ungulates appears to be insufficient to control some introduced plants (Stone *et al.*, this volume; Tunison and Stone, this volume). Biological control is a possible solution only for some widespread species (Gardner, this volume; Markin and Yoshioka, this volume). New plant species continue to be introduced into Hawai'i, and disruptive species continue to expand into protected areas.

HAWAII VOLCANOES NATIONAL PARK

At Hawaii Volcanoes, the level of staffing is inadequate to manage alien plants, and volunteers are used to supplement the efforts of paid employees. The introduced plant program consists of control efforts on 39 localized species on a parkwide basis (Tunison and Zimmer, this volume), and nine widespread species in eight localized areas called Special Ecological Areas (the least disturbed, most diverse or representative areas in the Park) (Tunison and Stone, this volume). Extending parkwide control programs to additional widespread species (*e.g.*, fountain grass, *Pennisetum setaceum*, and kāhili ginger, *Hedychium gardnerianum*) identified by Park staff would require approximately 20 alien plant workers per year (National Park Service 1986) for initial control stages.

Although volunteers have contributed significantly to the alien plant control program at Hawaii Volcanoes, the level of volunteer contribution is significantly lower than that of paid staff (Table 1). In five years (1981-1985) volunteers contributed 430 worker-days (11.4% of total effort) to introduced plant control projects. Paid staff accounted for 3,345 worker-days (88.6% of total effort) during this period (Table 1). Volunteer contributions have increased somewhat each year, with especially high levels of support in 1985 because of a single British group, Operation Raleigh. Most contributions were made by volunteer groups working in Special Ecological Areas or by individual volunteers monitoring vegetation. Conservation groups such as Friends of the Forest and Sierra Club have adopted a Special Ecological Area or portions of one, in which they conduct some of the needed management under the direct supervision of a National Park Service employee. Volunteers working as individuals are typically students who map weeds or monitor plots and transects. Most volunteers are from out of State, but numbers of local volunteers are increasing. Volunteers cost approximately $7 per day in stipends for food and lodging.

Volunteer support at Hawaii Volcanoes National Park is limited by four factors:

1. Alien plant control programs require timely follow-up treatments. Volunteer contributions tend to be unpredictable in level and timing. Therefore, most programs are carried out by paid staff.

2. It is difficult to motivate volunteers for many control programs because field activities are strenuous and monotonous, target plants are difficult to locate and identify, and progress in controlling plants cannot be perceived by volunteers after one or two treatments or in the short period they are involved.

3. The population base of Hawai'i Island is low, and interest in conservation is lower than many other areas of the nation. This is made worse by the fact that costs for airfare, housing, and supplies discourage the use of volunteers from off-Island; therefore, off-island volunteers are no longer recruited at Hawaii Volcanoes.

Table 1. Volunteer contributions (worker days) to alien plant control programs at Hawaii Volcanoes National Park and The Nature Conservancy of Hawaii Kamakou Preserve.

Year	Worker Status			Volunteers				
				Work Unit		Origin		
	Volunteers	Paid Staff	Total	Individuals	Groups	Local	Off-Island	Out-of-State
HAWAII VOLCANOES								
1981	5	350	355	5		5		
1982	20	350	370	10	10	10	10	
1983	40	630	670		20		35	5
1984	60	810	870	60				60
1985	305	1,205	1,510	60	235	45		250
Subtotals	430	3,345	3,775	135	265	60	45	315
KAMAKOU								
1983	81	15	96		81		81	
1984	73	15	88	10	63	24	39	10
1985	36	8	44		36	7	29	
Subtotals	190	38	228	10	180	31	149	10
Totals	620	3,383	4,003	145	445	91	194	325

4. Park managers believe that the time required to recruit, motivate, care for, and supervise volunteers is often more productively spent on other projects.

KAMAKOU PRESERVE

In contrast to Hawaii Volcanoes, 83% (190 worker-days) of the alien plant control work done at Kamakou Preserve from 1983 through 1985 was accomplished by volunteers (Table 1). Kamakou had only one paid staff member during that time. This individual coordinated or conducted all alien plant and animal control and interpretive and fund-raising activities at the Preserve. At least 50% of the volunteer worker-days were spent on reducing population levels of the higher-priority target alien plant species such as karakanut (*Corynocarpus laevigata*), black wattle (*Acacia mearnsii*), paperbark (*Melaleuca quinquenervia*), and strawberry guava or waiawī (*Psidium cattleianum*). Volunteers are successful and maintain high motivation levels with these particular plant species. Target plants occur in highly localized populations, are easy to locate and identify, and are readily eradicable by simple techniques such as cut stump or frill (notching) treatments. Progress in controlling these species is noticeable, and several areas have been cleared except for seedling stages.

A steady flow of volunteers at Kamakou issues from two main sources: the Honolulu chapter of the Sierra Club and local Moloka'i groups. The impetus for Sierra Club involvement started during a two-week summer weed control project in 1983. All expenses were provided by The Nature Conservancy of Hawaii. Eight volunteers contributed a total of 80 worker-days at a total cost of approximately $2,000 ($25/worker-day).

By working with key members of Sierra Club work parties, the Preserve Manager facilitated the establishment of a long-term volunteer group, known as the "Longweekenders." Longweekenders work in Kamakou on alien plant control projects eight to ten long weekends or holidays each year. Veterans of previous outings lead, with minimal supervision from the Preserve Manager, work parties of eight to ten people, approximately half of whom are new to the Preserve. Motivation and productivity are high, and the groups are essentially self-supervised. The Preserve provides supplies and materials for plant control, transportation from the airport, and lodging. These volunteers cost the Preserve $10/day/person.

The Longweekender trips have become very popular. One day of work is followed by two days of exploring the Preserve or Moloka'i, which appeals to many O'ahu residents, the majority of Longweekenders. An important factor motivating volunteers to come to Kamakou is the intact nature of Preserve ecosystems and the rural nature of Moloka'i.

Service trips by Moloka'i groups are not as cost-effective as Longweekender trips, but they expose local citizens to the Preserve and elicit support for Preserve programs on Moloka'i. Most local groups -- Teachers for Kamakou, 4-H groups, and Moloka'i Boy Scouts -- participate on

a semi-annual basis, and trips are conducted in two parts. The morning session is devoted to weed control work, while the afternoon session is spent on an interpretive hike guided by the Preserve Manager. The Preserve also provides transportation and refreshments.

Management plans for Kamakou mandate increasing use of volunteers. However, achieving this objective depends largely on enhanced staffing and improved vehicle support.

VOLUNTEER MOTIVATION

A number of lessons about volunteer programs have been learned at Kamakou and Hawaii Volcanoes:

1. The most cost-effective volunteer groups are those with trained leaders who can organize, motivate, and supervise themselves and their groups. The Longweekenders at Kamakou are a good example of a productive and self-directed volunteer group.

2. Volunteers are most productive and motivated when working with mechanical, cut-stump, or frill treatments, with readily recognizable plants, and with target species with localized geographical ranges.

3. To motivate volunteers, managers need to provide projects in which progress is demonstrable and where recognizable work units can be completed by the end of each work session. Localized introduced plants on Kamakou and in Special Ecological Areas in Hawaii Volcanoes provide projects that meet these criteria.

4. Recognizing volunteer contributions through media exposure increases volunteer support as well as public education. (However, efforts of paid staff should also be recognized to prevent conflicts.)

5. Integrating natural history interpretation, recreation, and work projects helps increase volunteer understanding and motivation.

Literature Cited

Gardner, D.E. [this volume] Plant pathogens as biocontrol agents in native Hawaiian ecosystems.

Jacobi, J.D., and F.R. Warshauer. [this volume] Distribution of six alien plants in upland habitats on the island of Hawai'i.

Markin, G.P., and E. Yoshioka. [this volume] Evaluating proposed biological control programs for introduced plants.

National Park Service. 1986. Natural Resources Management Plan and Environmental Assessment, revised January 1986. Hawaii Volcanoes National Park.

Stone, C.P., L.W. Cuddihy, and J.T. Tunison. [this volume] Responses of Hawaiian ecosystems to removal of feral pigs and goats.

Tunison, J.T., and C.P. Stone. [this volume] Special Ecological Areas: an approach to alien plant control in Hawaii Volcanoes National Park.

Tunison, J.T., and N.G. Zimmer. [this volume] Success in controlling localized alien plants in Hawaii Volcanoes National Park.