EARLY DETECTION AND RAPID RESPONSE: RESTORATION OF HAWAII’S OFFSHORE ISLETS

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INTRODUCTION
Offshore islets are discrete management units where methods for restoration can be tested and refined. Invasive plant species have the potential to alter the composition and structure of these islets and pose a severe threat to native biota. These islands are relatively small and so even the most widespread invader could be eradicated from the islands given considerable resources. However, most managers have limited resources. Early detection and rapid response is a cost effective tool for assisting in restoration. In many cases, invasive plant species can be found when restricted to a single individual or just a few plants. These species can then be removed at that time, or as soon as possible.

METHODS
Botanical surveys were done on the offshore islets of Oahu and Maui in the spring of 2005. Transportation to the islets by boat and helicopter was provided by the Department of Land and Natural Resources, Division of Forestry and Wildlife and the Offshore Island Restoration Committee. We did walk through surveys noting plant species present and their relative abundance. Invasive plants which were found in limited distribution were removed during the survey. Plants were hand pulled and put in plastic trash bags. For some of the more woody species, we used loppers and herbicide (a small spray bottle of Brush-B-Gon). Seeds were put in plastic trash bags.

RESULTS
Many invasive plant species were found in limited distribution and removed at the time of the survey. Some of the early detection successes include the following:
• Ivy gourd (Coccinia grandis): This invasive gourd vine and declared Hawaii state noxious weed, was nowhere widespread on Makua, yet was limited in distribution on Molokai, Popoia (treated during survey) and Manana.
• Buffel grass (Cenchrus echinatus): An invasive grass that forms monocultures and rapidly crowds out native vegetation was found along a trail near the coast on Manana and was removed.
• Chinese lantern (Ficus microcarpa): A widespread weed in the Hawaiian Islands with bird dispersed fruits was found sparingly (one tree) on Mokupipi islet. This tree could be removed before it engulfs surrounding vegetation and seeded nearby trees.
• Koa haole (Luehea hirsuta): This quick spreading woody shrub was removed during surveys on Kahoikiipu and Popoia. One small plant was observed on Molokai and could be removed in similar fashion.

Other species found in limited distribution during surveys include: spiny adygarthites (Achyranthes aspera), spiny amaranth (Amaranthus spinosus), Chinese water spinach (Ipomoea aquatica), pickle weed (Rhibitis maritima), Spanish needles (Bidens alba var. radiata), sandbur (Cenchrus echinatus), sea grape (Coccoloba uvifera), asystasia (Asystasia gangetica), Burmese cherry (Ficus microcarpa), jackfruit (Artocarpus heterophyllus), Chinese pistache (Pistacia chinensis), inia (Ficus microcarpa), button mangrove (Conocarpus erectus), and beach heliotrope (Tournefortia argentea).

DISCUSSION
On offshore islets, detecting weeds early and removing them before they become widespread requires relatively little labor and materials, increases the probability of successful control, and reduces in maximum disturbance. Knowing which species to look out for in specific habitats is important. Sides of islets facing main islands often first appear, and areas of high vulnerability require extra focus. Early detection and rapid response is an important tool in managing weeds on Hawaii’s offshore islets and could be implemented in many of Hawaii’s restoration efforts.

CONCLUSION
Offshore islets, particularly those that are relatively weed free, are high value conservation sites home to numerous native plant and animal species. To protect these high value sites, it is important to find new weeds early and remove them as soon as possible. With high value sites, areas of high vulnerability require extra focus. Early detection and rapid response is an important tool in managing weeds on Hawaii’s offshore islets and could be implemented in many of Hawaii’s restoration efforts.

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