

# STATUS OF INVASIVE NON-NATIVE PLANTS IN THE NORTHWESTERN HAWAIIAN ISLANDS

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Figure 1. Flower of golden crown-beard (*Verbesina encelioides*).

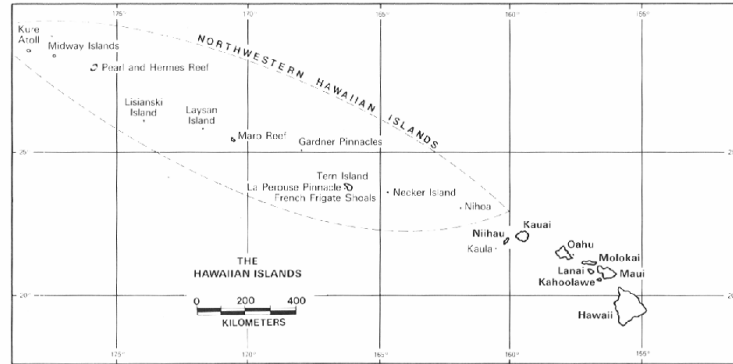


Figure 3. Map of the Hawaiian Islands, delineating the Northwestern Hawaiian Islands (from Herbst & Wagner 1992).



Figure 6. Fields of *Verbesina encelioides* on the central plain of Kure Atoll.

## INTRODUCTION

The Northwestern Hawaiian Islands (NWHI) are remote islands and atolls that make up the geologically older, northwestern extent of the Hawaiian archipelago. Atoll vegetation is typically made up of indigenous littoral species and is fairly resilient to disturbances. However, the history of human occupation has greatly altered several of these remote sand islands. To quantify the current status of the vegetation, botanical surveys were conducted on Kure Atoll, Midway Atoll, Pearl and Hermes Reef, Lisianski, Laysan, and Tern Islands. This poster reports on the major findings of the surveys with emphasis on invasive plant species that were detected, the role of rapid detection, ongoing monitoring and rapid control of invasive weeds in the NWHI and elsewhere, and recommendations for future invasive plant species work based on lessons learned. On Midway, about 80 species previously not recorded from the atoll were detected, many of which were highly invasive and restricted to small populations. On Pearl & Hermes Atoll, we documented two highly invasive plant species new to the relatively pristine atoll. Some of the harmful species identified by the survey have already been eradicated.

## METHODS

Walk through surveys of the islands were done with two people (Starr & Martz) at about 10 meters apart from each other. We recorded each plant species and estimated relative abundance on the island. Extra time was spent searching areas where rare plants were historically known and areas where introductions seemed likely, such as sites inhabited by humans. Significant records that were detected during these surveys were collected and deposited at Bishop Museum.



Figure 2. Collecting plants on Spit Island, Midway Atoll.

## RESULTS

Invasive plant species detected during this survey included golden crown-beard (*Verbesina encelioides*), sandbur (*Cenchrus echinatus*), ivy gourd (*Coccoloba grandis*), buffel grass (*Cenchrus ciliaris*), bitter melon (*Momordica charantia*), and New Zealand spinach (*Tetragonia tetragonioides*). Currently, vegetation monitoring and control of invasive plants is occurring on Laysan Island, Pearl & Hermes Reef, and Midway Atoll. To a lesser extent, there is work done on both Kure Atoll and Tern Island. There have been many successful eradications in the NWHI including the removal of *Coccoloba grandis*, Christmasberry (*Schinus terebinthifolius*), guava (*Psidium guajava*), and Mexican creeper (*Antigonon leptopus*) from Midway Atoll. *Cenchrus echinatus* has been eradicated from Tern Island and is almost completely eradicated from Laysan Island. On Pearl and Hermes, control efforts have begun against the recent establishment and spread of *Verbesina encelioides*, a species documented by this survey and identified as a control priority.

Status	Kure	Midway	P & H	Lisianski	Laysan	Tern
Alien	36	251	10	4	13	14
Indigenous	10	13	6	10	11	7
Endemic	3	3	3	3	6	1
Total	49	267	19	17	30	22

Figure 4. Plants observed during survey.



Figure 5. Map of Midway Atoll showing known distribution of invasive species on Sand Island.

## CONCLUSIONS

The NWHI are finite areas where techniques for restoration and weed prevention, detection, and control/eradication strategies are highly successful. Lessons learned on these smaller islands can be applied to similar efforts on the main Hawaiian Islands and vice versa. Alien plants which may be harmful to NWHI can be identified and addressed in a timely manner through periodic monitoring and rapid control. Eradication is easiest when population size is small, preferably a single site, control is swift, and follow up is diligent. As suggested by Herbst and Wagner (1992), a well illustrated non-technical manual of the common plants of the NWHI would assist in identifying plants. In addition, a full time control crew, similar to the Maui Invasive Species Committee on the main Hawaiian Islands would help to coordinate control efforts across Atoll boundaries and hopefully get ahead of some of the worst invasions.

## LITERATURE CITED

Herbst, D.R. and W.L. Wagner. 1992. Alien Plants on the Northwestern Hawaiian Islands. In: Alien Plant Invasions in Native Ecosystems of Hawaii. C.P. Stone, C.W. Smith, and J.T. Tunison, eds. University of Hawaii Press, Honolulu, Hawaii.



Figure 7. Aerial view of Eastern Island, Midway Atoll.