

**Title:** Management of Axis Deer on Maui Island

**Organization:** Maui Axis Deer Working Group

**Award(s):** \$72,790

**Introduction:** Axis deer (*Axis axis*) were first introduced to Maui in 1959. The population has since grown and spread across the island. Farmers and ranchers have reported major crop and forage damage. Maui's forested watersheds suffer from deer browsing and rubbing. Axis deer pose an increasing risk to residents and tourists due to deer-vehicle collisions and present a safety hazard to residents due to increased poaching activities. The Maui Axis Deer Working Group (MADWG), comprised of local farmers, ranchers, state and local agency personnel, tourist industry representatives, and hunters, formed in October 2010 to address the axis deer problem on Maui. A comprehensive plan was created with an overarching goal of initiating effective axis deer management to reduce negative impacts. A key recommendation was to hire a coordinator. In May 2013, a full-time coordinator began working to implement the Management Plan. Funds from the Hawai'i Invasive Species Council provided approximately 75% of total funding for FY13, with the remaining support from the County of Maui.

---

### **Achievements in FY13**

**Deliverable 1: Determine current axis deer population status on Maui.** Work focused on the following objectives of the Management Plan:

- *Work with University of Hawai'i or non-governmental agencies on development of population models. Develop appropriate measures to track population trends. Assess and monitor axis deer population using scientifically-based methods.* Extensive research was conducted to determine the best approach for determining population levels. Specific activities included: comprehensive literature searches in wildlife management journals and consultations with Hawai'i and mainland wildlife biologists at the following institutions: U.S. Geological Survey, Hawai'i Department of Land and Natural Resources (DLNR), University of Hawai'i, University of Arizona, and Brigham Young University. The preferred design includes aerial surveys using "distance sampling" methodology; ground-based surveys; and collection of data using radio collars to generate information on survival and mortality. A series of aerial surveys (14 survey hours plus a 3-hour operational test flight) was conducted across portions of Upcountry, South and West Maui. Transect lines were predetermined using ArcGIS. Three counters in the helicopter recorded all deer observed using voice recorders; estimated distance from the helicopter using range finders; and recorded geospatial data for transect lines flown. Data analysis will be completed by December 2013 with additional surveys continuing beyond this reporting period.
- *Consult with state agencies to assess relevance and availability of axis deer data.* An open dialogue has been established with stakeholders and DLNR representatives to gather harvest data and other mortality records for inclusion in the population analysis. The Coordinator met with DLNR wildlife staff to review availability of data from previous axis deer aerial surveys, wildlife control permits, and harvest data, and also met with managers of Maui's large ranches to obtain information about number of deer harvested.

**Deliverable 2: Identify Management Focus Areas (MFAs) based on landscape, human population density, land use, conservation value, legal control options, and deer control / harvest history.**

Meetings with stakeholders and State biologists helped clarify management goals and objectives for different areas on Maui. The delineation of Management Focus Areas is in development but necessarily depends on collation of data from various sectors, which is ongoing.

**Deliverable 3: Increase public understanding of deer biology and impacts of an unmanaged population on human health, agriculture, tourism, and forest health.** Two newspaper articles on axis deer were published in the Maui News reaching an estimated audience of 22,000 readers. An article in Maui No Ka Oi magazine (circulation of 25,000) highlighted challenges and potential solutions. The Maui Huliau Foundation, which works with local middle and high school students to produce and edit environmental videos, selected the deer management program as an upcoming student film project. The Coordinator will continue working with the students to create a short video; it is expected to have a local premiere and will be broadcast on the local cable station. Information about the Management Plan was shared at the Olinda Community Association (attended by 25 people) and the Coordinator has met with local residents expressing concerns related to deer hunting near homes.

---

#### **Other Activities in FY13**

The following additional activities addressed specific objectives outlined in the HISC Strategic Plan.

**Other activity 1: Support development of management plans for widespread vertebrate pests.** In June 2013, the MADWG helped organize a meeting of Hawai'i wildlife and invasive species experts. In addition to reviewing current methods used for ungulate aerial population assessments, the group identified research needs relating to ungulates in Hawai'i and committed to continuing to meet as an *ad hoc* group. Issues identified for future work included: summarizing previous population estimates and current techniques for ungulate management in Hawai'i; considering carrying capacity for ungulates on different islands; summarizing what is known about ungulate parasites; data standardization; identifying priority needs; mapping current ranges of different species; and identifying previous studies that could be published as technical reports. A follow-up meeting held in July 2013 at the Hawai'i Conservation Conference began compiling a list of ungulate species and status on each island. This statewide working group on ungulates is expected to provide an informal network of experts that can help support management of ungulates across the islands.

**Other activity 2: Coordinate with counties to increase resources and funding to address county-sponsored activities involving invasive species:** Maui County continues to show a strong commitment to addressing the axis deer issue. Participants in plan development included: the Maui County Mayor, Maui County Environmental Coordinator, Office of Economic Development Agricultural Specialist, and Council Members. The Maui County Office of Economic Development committed resources in both FY13 and FY14 to help ensure the success of the project. Maui County is also supporting efforts by the separate Maui Axis Deer Harvest Cooperative, which has begun removing axis deer from Upcountry private residences. An estimated 400 deer have been removed under this project.

---

#### **Additional Information**

Aerial surveys were able to make use of no-cost helicopter services arising from the U.S. Fish & Wildlife Service case against the illegal transport of axis deer from Maui to Hawai'i Island. This option will not be available for future surveys. County funding will help address part but not all this operational gap for FY14. The Maui Axis Deer Project is a project of Pacific Cooperative Studies Unit (University of Hawai'i).

---

#### **Contact Information**

**For more information, please contact:**

Kanalu Sproat

Maui Axis Deer Program Coordinator

[kanaluks@hawaii.edu](mailto:kanaluks@hawaii.edu)

(808) 495-5539