



Pacific Basin Information Node

PBIN: Invasive Species Management and Support

Data tools and technologies: invisible components of invasive species management

Background: Invasive Species in Hawaii

The biologically-rich Hawaiian Islands provide a near-ideal laboratory for addressing harmful invasive species problems, because invasive species are overwhelmingly the state's dominant biological resource issue today. Hawaii's invasive species crisis affects the state's many endemic plants and animals, overall environmental and human health, and the viability of its tourism- and agriculture-based economy. Hawaii's problem with non-native species *is the most severe of any state*. Federally significant resources are at stake, including prime national park natural areas and a third of the nation's endangered species. The gravity of Hawaii's situation is resulting in innovative approaches that have the potential to become useful national and global models. These islands are isolated little fortresses surrounded by large expanses of ocean and subject to invasion primarily through human action. The problem of invasive species can be effectively addressed only with coordinated interagency management

based on good science and data, and with the help of informed citizens.

Statewide Approach

Grassroots interagency efforts to address invasive species problems at the individual island level have led over the past decade to independent establishment of five island-based Invasive Species Committees (ISCs) – on the Big Island, Maui, Molokai, Oahu, and Kauai – that receive funding from diverse sources (federal, state, county, and private). Additionally, a top-down, statewide interagency effort, the Coordinating Group on Alien Pest Species (CGAPS), was established in 1995. CGAPS recently took on the task of helping with fund-raising and coordination of the ISCs.

The ISCs must prepare proposals and report progress to diverse funding sources on an annual basis. Data are critical to the process. It is important to know what invasive species are present, where they are located, the extent of the infestation, whether the land is private or public, and the method(s) used to treat the invaders. These data help in determining treatment priorities, support annual funding requests, and help in both determining the effectiveness of the procedures and in the evaluation of the status and extent of infestations. Over the years, the ISC business processes developed independently from funding sources. This has made it difficult to

obtain data that could be integrated for a statewide assessment, to implement intra-island comparisons, or to share lessons learned between islands.

Integrating the Data

Over the last three years, the NBII Pacific Basin Information Node (PBIN) has spearheaded the development of a statewide invasive species information system. The project has become a key component of the efforts to combat invasive species in Hawaii. The first phase was completed with the development of a statewide reporting system, including the necessary technical infrastructure and data standards. This was the first time that a system was available for reporting data collected throughout the state. Cooperators in the effort are members of the CGAPS, which includes key members of the state, federal, and non-governmental agencies.

This statewide invasive species information system demonstrated that such an approach can be deployed to address this important problem threatening biodiversity and further identified the need for the development of a common data structure and spatial data standards to be applied by each ISC. Observation data from the invasive species management effort are now being added to the PBIN site and can be accessed via pbii.nbio.gov/maps/interface.html.

Photo credits: brown tree snake - CGAPS; flower and ivy gourd - Forest and Kim Starr; Pig, USGS; Coqui - Allen Allison, Bishop Museum; banana bunchy top - Hawaii Dept. of Agriculture (HDOA)



Invasive species threats in Hawaii (from left to right): brown tree snake; Asian melastome; feral pig; ivy gourd; coqui frog; and banana bunchy top virus.

Case Study: Miconia (*Miconia calvescens*)

Miconia is recognized one of the greatest threats to tropical and subtropical rainforests and watersheds. This invader is capable of extinguishing biodiversity on an island wide scale, outgrowing native plants, and replacing native forest stands.

Miconia is being aggressively combated by interagency efforts in Hawaii. PBIN is assisting with data coordination and analysis for miconia control efforts, providing support to the diverse groups banding together to stop the miconia invasion.



Photo credit: Forest and Kim Starr

A single miconia (*Miconia calvescens*) plant quickly grows and reproduces into a solid miconia tree forest that shades out native plants. Pictured below, biologist Jean-Yves Meyer stands beneath such a forest of non-native miconia trees in Tahiti.



Photo credit: Lloyd Loope, USGS



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Photo credit: HDOA

Case Study: Little Fire Ant (*Wasmannia auropunctata*)

The little fire ant (*Wasmannia auropunctata*) was first noted on the island of Hawaii in 1999, and has since spread to comprise more than 50 discrete populations. This small ant, which delivers a painful sting completely out of proportion to its size, is considered one of the 100 most dangerous invasive ants by the Invasive Species Global Program.

Tracking the invasion is critical to the containment and control of this pest, preventing further spread of this tiny ant. Bringing together ant reports and management data from varied sources is critical to this process.



Photo credit: Lloyd Loope, USGS

House cat from the Puna district of the island of Hawaii apparently blinded by repeated stinging of the little fire ant.



Photo credit: Allen Allison, Bishop Museum

Case Study: Coqui frogs (*Eleutherodactylus coqui*)

Coqui were inadvertently introduced to Hawaii with greenhouse material from the Caribbean in the early 1990s. In Hawaii, the frogs have thrived in the absence of predators, have been spread widely through sale of infected nursery plants, and have locally attained densities far greater than occur in their native range. Although coqui pose a substantial threat to biodiversity in Hawaii, public concern centers on the loud noise these frogs make <www.hear.org/frogs>.

PBIN is assisting with the data coordination and communication between the public and private agencies, which are endeavoring to control coqui.

For More Information

Dr. Mark Fornwall
NBII/PBIN Node Manager
Phone: 808-984-3724
E-mail: mark_fornwall@usgs.gov

Mr. Sky Harrison
NBII/PBIN Content Manager
Phone: 808-984-3722
E-mail: sharrison@usgs.gov

Find us on the Web at:
<<http://pbin.nbii.org>>.

The National Biological Information Infrastructure (NBII) <www.nbii.gov> is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. The NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non-government

organizations, and private industry. NBII partners and collaborators also work on new standards, tools, and technologies that make it easier to find, integrate, and apply biological resources information. Resource managers, scientists, educators, and the general public use the NBII to answer a wide range of questions related to the management, use, or conservation of this nation's biological resources.