

A Vision for an Expanded Invasive Species Information System for Hawaii and the Pacific

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No other region of the United States is so devastatingly affected by invasive species as the Pacific. In the Hawaiian and Pacific islands, policy makers, managers, scientists, the public, and the media need a recognized clearinghouse for authoritative information and contacts on invasive species issues. This clearinghouse should provide, in a readily accessible format, comprehensive, synthesized information to facilitate sound policy, effective management, and quick action throughout Hawaii and the Pacific. USGS' Hawaiian Ecosystems at Risk (HEAR) project, started in 1996, provides an excellent start toward such an information system. Since 1998, HEAR has been complemented by PIER (Pacific Island Ecosystems at Risk), an invasive species information system for U.S. territories in the Pacific led by the U.S. Forest Service. HEAR (www.hear.org) and PIER (www.hear.org/pier) are already having a substantial impact in facilitating progress in addressing invasions, but they are doing little more than scratching the surface toward the comprehensive system that is needed by this vulnerable region.

In FY2001, Hawaii is slated to become a node of the National Biological Information Infrastructure (NBII) - at this point at least tentatively called the Pacific Basin Information Node (PBIN). We would like to take this opportunity to present our vision of how the HEAR project should be expanded under PBIN to become a highly effective tool for addressing invasive species issues.

The Hawaiian Ecosystems at Risk project (USGS/PIERC) strives to collect and disseminate information on harmful non-native species in the state of

Hawaii to land managers, decision-makers, and the general public. HEAR provides publicly-available web-based and other information, as well as technical infrastructure and support for those who are collecting data and creating information about harmful non-native species and their effects on Hawaii's environment. Many of the basic functions of PBIN are already in place in HEAR. The creation of PBIN could facilitate expansion of the scope and detail of the information available through HEAR, and allow HEAR to be more effective at providing infrastructure and manpower to develop more comprehensive information storage and retrieval systems. HEAR is a good framework to examine to determine appropriate ways to develop a regional information system about harmful non-native species in the Pacific Basin.

Existing HEAR infrastructure gives PBIN an excellent head-start on its alien species information function. Among other things, HEAR already maintains a much-used website including information on many alien species in or of concern to Hawaii and Pacific Basin countries; facilitates communication among multitudes of individuals and organizations by maintaining internet-based mailing lists for many alien species interest groups; provides an up-to-date clearinghouse of activities of many local and international alien species-related working groups; provides an online "mystery plant" identification service; regularly provides information to local landscaping groups about invasive species; and provides consultation on database design and custom software applications for local, statewide, and international alien species projects.

Additional resources could be well-used by HEAR to provide better and more comprehensive information on alien species which are--or have the potential to be--problematic in Hawaii and the Pacific Basin. Examples of areas that could be enhanced include: additional species accounts need to be added; more detailed information needs to be added per species, particularly for priority species (such as identification, control, mapping & distribution, prevention of spread, history, legislation, case studies locally & elsewhere, expert contact information); more efficient methods for web updates need to be developed (in progress now); website design needs to be periodically reviewed to ensure easiest and most efficient access to needed resources; efforts towards selection and implementation of appropriate data standards (to fulfill local needs, yet be compatible with national and international standards, e.g. taxonomic nomenclature) need to be expanded; and integration with other data collection efforts (e.g. local, national, and international geospatial datasets) need to continue and expand. **Progress towards fulfillment of these objectives will require additional personnel dedicated to HEAR activities (either to perform these activities, or to perform some existing functions now being done by the sole HEAR employee).**

There is an urgent, internationally-recognized need in Hawaii and throughout the Pacific Basin to provide an effective "early warning" system to trigger appropriate responses to new infestations of harmful non-native

organisms. Such a system would entail gathering and disseminating increasingly comprehensive information on what species are invasive in similar climates and habitats elsewhere in the world so that Hawaii and the Pacific islands can attempt to exclude these species through quarantine and to watch for them in case they arrive on the islands' shores. This is particularly important for Hawaii; since most of the world's climate zones are present in Hawaii in close proximity to one another, species which are invasive almost anywhere in the world are potentially problematic to Hawaii. **HEAR is in a unique and excellent position to be central to this harmful alien species information early warning network.**

The success of PBIN is obviously dependent on interagency networking, as is the success of HEAR. PIERC/HEAR has established fruitful relationships with many cooperating agencies and organizations. This (mostly informal) network will be invaluable as part of the invasive species component of PBIN.

The diagram above illustrates some of the organizations and agencies that interact with HEAR and each other with respect to providing and/or using information about alien species. Following are brief descriptions of HEAR's relationships to each of these entities:

PIERC - One of the main functions of the USGS Pacific Island Ecosystems Research Center (of which HEAR is a part) is to provide relevant information on harmful non-native species. PIERC offices and researchers are--and can be more so in the future--primary contributors of information to HEAR's information system. HEAR could be the primary repository for PIERC alien species information for PBIN, as well as provide access to valuable information for PIERC researchers.

DLNR - The Hawaii State Department of Land and Natural Resources requires information about harmful non-native species in order to most effectively manage its natural areas and other lands, as well as to make policy decisions about non-native species within the state of Hawaii. DLNR is also a source of useful information about the presence, behavior, and controllability of alien species on State and other lands.

ISCs - Invasive Species Committees (e.g. Maui Invasive Species Committee, Big Island ISC, Oahu ISC) are grassroots, cooperative interagency groups formed by voluntary participation of partner agencies on most of the main Hawaiian islands to set priorities and tackle on-the-ground invasive alien species problems, with emphasis on rapid response to incipient invasions. These groups require current best available information as provided by HEAR to make wise decisions, especially regarding priorities for target species. ISCs can also be excellent sources of information feeding into HEAR about effectiveness of control methods, and presence and extent of invasive alien species threats. HEAR currently maintains web pages and/or e-mail lists for all ISCs.

CGAPS - The Coordinating Group on Alien Pest Species (CGAPS) is a multi-agency partnership to coordinate more effective protection for Hawaii's economy, environment, health, and way of life from harmful alien pests. CGAPS has in the past been most successful in public education. A current CGAPS project involves developing statewide capacity for prevention, detection, rapid response, control, and public education for invasive alien species. PIERC/HEAR works closely with CGAPS and many of its member agencies.

AgDepts - PIERC/HEAR has been developing close ties to the Hawaii Department of Agriculture and USDA-PPQ-Port of Honolulu through ISCs and CGAPS over the past two years. **The potential for HEAR/PBIN to assist in the targeting, refining, and facilitating quarantine efforts in the Pacific is enormous.**

PIER - The Pacific Islands Ecosystems at Risk project (U.S. Forest Service) already has an impressive amount of detailed information about invasive plant species throughout the Pacific Islands, which--in cooperation with HEAR--will soon be available as a structured database as well as its current online form (www.hear.org/pier).

NPS - The National Park Service directly manages important natural areas of national significance. Best management practices require current and accurate information on non-native species which threaten these areas. Additionally, NPS research provides important information about these ecosystems and their threats, which could feed into HEAR (and therefore would feed into the PBIN network). HEAR and the NPS Inventory & Monitoring program could interact and maintain complementary data sets. HEAR can be a valuable resource for (and can collect & disseminate valuable information from) the newly-established NPS Pacific Islands Exotic Plant Management Team.

USFS - HEAR posts some U.S. Forest Service results online, and interacts with the USFS indirectly in other ways due to USFS involvement in such interagency groups as PIER, the ISCs, and "Operation Miconia" (a program which targets one of Hawaii's worst weeds).

ITIS - HEAR is working on ways to effectively use the Integrated Taxonomic Information System as a nomenclatural standard for data collection statewide & regionwide (see also "BISHOP", below).

HNHP - With respect to PBIN, the Hawaii Natural Heritage Program could serve as a spatial data products center, a metadata hub, a technical training center for biological resources personnel, and/or a software development and support center for conservation and biological sciences partners. HEAR data could be part of the information that feeds into HNHP. (HNHP is associated with The Nature Conservancy of Hawaii and the University of Hawaii. Additionally, HNHP

administers the recently activated Hawaii-USGS Gap Analysis Program, one goal of which is to provide vegetation mapping GIS layers for Hawaii.)

BISHOP - The Bernice P. Bishop Museum and the Hawaii Biological Survey could serve a very important function by setting nomenclatural standards for species relevant to the Pacific Basin. This information could feed into ITIS (perhaps with HBS being a "trusted source" and primary information provider for ITIS), thus expanding the scope of that system to make it more useful to a broader audience.

USFWS - The U.S. Fish & Wildlife Service needs information to fulfill its mandates of protecting endangered species and national wildlife refuges. Additionally, information generated by or otherwise obtained from USFWS would be valuable contributions to PBIN.

Int'l - HEAR is involved with a number of international groups, including the Invasive Species Specialist Group (ISSG) of the World Conservation Union (IUCN); the Global Invasive Species Programme (GISP); the International Weed Risk Assessment Workshop (IWRAP); and the South Pacific Regional Environment Programme (SPREP).

In summary, the Hawaiian Ecosystems at Risk project (HEAR) is well-positioned to expand into an even more effective alien species information source as part of the new NBII Pacific Basin Information Node.