

## **Creation and Publication of Invertebrate Database and GIS Information**

State of Hawaii  
Department of Land & Natural Resources  
Division of Forestry and Wildlife (DOFAW)  
1151 Punchbowl Street, Rm: 325  
Honolulu, HI 96813

Cynthia King, Entomologist  
Email: [Cynthia.b.king@hawaii.gov](mailto:Cynthia.b.king@hawaii.gov)  
Ph: 808-587-0019  
Fax: 808-587-0160

### **Project:**

#### Background:

DLNR holds the constitutional and statutory authority to protect wildlife resources in the state including, invertebrate fauna (Hawai'i Revised Statutes 1993). There are over 5000 described native terrestrial and aquatic invertebrates in Hawai'i, and it is likely that there are hundreds and perhaps thousands more which await description. A general lack of data available on native invertebrates makes specific biological, ecological, conservation and management assessments difficult to complete. However it is the insufficient information management (i.e. a lack of cohesive data compilation and storage tools) for data that have been collected which is an even greater impediment to invertebrate conservation and management efforts.

The lack of a cohesive data storage system, and an abundance of inaccessible grey literature and species records, currently precludes resource managers in the State of Hawai'i from systematically assessing populations and conservation needs of most native invertebrates. Scientific data relating to species biology, distribution, diet, and habitat requirement, provides the foundation for species listing, and subsequent conferral of state or federal protection. With few exceptions, these data are necessary to justify listing a species, creating a recovery plan, and designating critical habitat. Regardless of how rare and at risk a species may be, if resource managers are unable to piece together basic biological or distribution information, the organism cannot be effectively managed or protected.

The need for developing data integration and storage tools has been recognized by many state and federal agencies over the last 10 years, and as a consequence databases are now housing comprehensive data relating to Hawaii's birds, plants and fishes. It is without question that invertebrate conservation in Hawai'i would benefit enormously from the development and application of a similar tool.

### Scope of Work/Deliverables:

Objective: Design, develop and populate an ecological geo-referenced (GIS) database for invertebrate species in Hawaii. The database will house historical survey data, museum records, published literature, species lists, grey literature, and available data sources, and facilitate assessment of the conservation status of native invertebrate species.

Vendor shall in proper and satisfactory manner as determined by the State, provide all the goods and services, or both, set forth in this Request for Quotation (RFQ) and the Vendor's accepted proposal, both of which shall be attached and made a part of the Purchase Order Agreement.

The proposal shall address these specific requirements of the project:

- 1) Design and develop a spatially-hierarchical, geo-referenced database for invertebrate species throughout the Hawaiian Islands. The relational database will contain biological, taxonomical, ecological, physical, geographical, and source data including, but not limited to: temporal data (time, date), environmental data (weather conditions, temperature, wind, precipitation, moon phase), identification data (species, taxonomic classification, determined by), location data (locality, watershed, place name, elevation, GPS coordinates), habitat data (habitat type, habitat composition, host plant, plant-part), ecological data (behavior, associations with other organisms, parasitism, predation), land manager data (land manager, permit number(s), observer data (collector/observer, source, published, permission to publish required), museum data (location of specimen, accession ID).
- 2) The invertebrate database will integrate available data from multiple existing databases which contain invertebrate data. A translation and import process will be developed to simplify collection of outside invertebrate data collections. Bishop Museum has been housing invertebrate data from State Collecting Permits. As a first step, the contractor will collect, translate, and import both online and offline digital insect collection data from Bishop Museum into the newly created invertebrate database.
- 3) The focus of this contract is for the design and development of the backend of the invertebrate database that will be housed at DLNR. The database should be multi-user capable or upscaleable to multi-user capabilities with DLNR's longterm objective of supporting a web-based, searchable product that is freely accessible to the public, and which has the potential to grow and refine as additional data become available.
- 4) Public accessibility to sensitive data, such as specific locations of T/E species, should be limited by security features.
- 5) Voucher specimen photos and literature references will also be included and/or linked in the database.

- 6) Create project specific data entry tables, queries, forms, and reports to support management of native invertebrate research and collecting permits (scientific collection permits). The selected vendor shall lead meetings with DOFAW representatives to assure suitability of the invertebrate data entry tables, queries, forms, and reports.

The creation of an invertebrate database and the integration of GIS layered system will provide GIS-analyzable format will improve information availability and access for decision makers, managers, researchers, and general public. The selected vendor shall cooperatively participate and work with State/Federal Agencies in implementing this project.

**Requirements:**

- 1) Proposal shall be submitted through the Hawaii Electronic Procurement System (HePS).
- 2) At the time of awarding, the selected vendor shall be in compliance with Hawaii State Statutes and Regulations through the Hawaii Compliance Express (HCE).
- 3) Provide narrative and timeline for the proposed work to accomplish tasks listed in the scope of work for the invertebrate database and associated Geographic Information System (GIS) layers.
- 4) Attach conceptual diagram of proposed multi-spatial invertebrate database.
- 5) Provide list of project team members and their areas of expertise.
- 6) Qualifications (please attach to your proposal):
  - a. Documented experience with invertebrate species and data in Hawaii.
  - b. Documented experience with designing and developing relational databases.
  - c. Documented experience in Geographic Information System (GIS) analysis and database integration.
  - d. Documented history/background of successfully meeting project requirements and deadlines while working collaboratively with state and/or federal agencies.
  - e. Contractor must be familiar with online and offline digital insect data collections at Bishop Museum.
  - f. Contractor must have the authority to access and release information from online and offline digital insect data collections at Bishop Museum.

Please include at least two references for past projects and their final reports of team members associated with each of the areas of expertise (a-d) above. Provide description of expertise with the different online and offline insect databases at Bishop Museum (e) and documentation of the authority to access and release the information (f).

7) Other required documents may apply.

**Funding:**

Limited funding: Funds for this project are from State of Hawaii Special funds. Cost of the project is all inclusive, including but not limited to travel, taxes, hotel, auto rentals, supplies and incidentals that may arise. Payments shall be disbursed based on phases, as determined by the due dates of the Progress Reports, to be determined upon issuance of the Purchase Order Agreement.

**Time Schedule:**

The project is Time Limited: The project shall begin upon the issuance of the Purchase Order Agreement Number and authorization to proceed from DOFAW by letter or email. Progress reports shall be required, exact dates will be determined at the issuance of the Purchase Order Agreement. The product delivery and termination date of this project is June 30, 2012, and project timeframe may be extended if notified in writing one month prior to termination date.