

State of Hawaii  
Endangered Species Recovery Committee

Hawaiian Hoary Bat Research  
Request for Proposals

June 15, 2016

**I. Purpose**

The purpose of this Request is to support research projects that will provide information that will be used to guide future management efforts to implement effective conservation measures to contribute to a net recovery benefit of the Hawaiian Hoary Bat.

**II. Background**

The State of Hawaii, Endangered Species Recovery Committee (committee) is established under Chapter 195D, Hawaii Revised Statutes, to serve as a consultant to the Board of Land and Natural Resources (Board) and the Department of Land and Natural Resources (department) on matters relating to endangered, threatened, proposed, and candidate species. Among the duties of the committee are to review all applications and proposals for habitat conservation plans, safe harbor agreements, and incidental take licenses and make recommendations, based on a full review of the best available scientific and other reliable data, and in consideration of the cumulative impacts of the proposed action on the recovery potential of the endangered, threatened, proposed, or candidate species, to the department and the board as to whether or not they should be approved, amended, or rejected, and to consult with persons possessing expertise in such areas as the committee may deem appropriate and necessary in the course of exercising its duties.

In recent years, the committee has received numerous requests to review applications for incidental take licenses and proposals for habitat conservation plans that include provisions for the incidental take of the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*), also known as 'ōpe'ape'a, a species listed as endangered by the state and federal governments. The committee expects that proposals for additional take will be submitted for consideration in the near future. State law establishes certain conditions as required for approval by the Board of an incidental take license, including approval of a habitat conservation plan that provides a net recovery benefit for the affected species. However, determination of net recovery benefit of the Hawaiian Hoary Bat poses significant challenges due to the relative lack of information on the bat concerning threats, limiting factors, life history, and ecology, resulting in uncertainties that are of significant concern to the committee.

To address these critical information needs concerning Hawaiian Hoary Bat biology (ESRC 2015), the committee has and will advise prospective entities seeking incidental take licenses (licensees), that all habitat conservation plans submitted for consideration pursuant to incidental take licenses under state law for the Hawaiian Hoary Bat should include provisions for the implementation of effective research projects carried out by qualified individuals or organizations. The committee has further determined that it intends to provide specific advice to prospective licensees concerning qualified individuals or organizations and associated proposals that merit inclusion in proposed habitat conservation plans,

commitment of funds, and commission of work. Therefore, the committee herein solicits proposals from qualified individuals and organizations (applicants), to carry out research and development projects related to the conservation biology of the Hawaiian Hoary Bat, with details to be provided below.

### III. Research Goals and Objectives

Through this Request, the committee will review and recommend for support, qualified proposals that address one or more of the following priority research needs. Outlined below are research goals and objectives that will be considered for support, with relative priorities noted in parentheses following each objective. Objectives identified as priority (1) are considered to be the most immediate needs. Objectives identified as priority (2) may be a lower priority or a priority for which pre-requisite information is currently lacking.

#### 1. Goal: Basic research.

Conduct basic research to obtain information that will guide and assist conservation efforts.

Objectives include:

- a. **Document distribution.** Conduct island-wide surveys on Maui and Oahu using replicable methods to document distribution. Document seasonal changes in spatial occupancy. This information may inform efforts to evaluate risk associated with proposed actions and inform management decisions for conservation benefit and provide baseline information needed to understand the potential role of habitat suitability in limiting populations of the bat. (1)
- b. **Document demographic information.** Conduct research to determine basic demography, such as annual survival, reproductive success, maximum lifespan, age of 1st breeding, % of breeding females, number of broods per year, mating system, etc. (1)
- c. **Document home range and movements.** Conduct radio-telemetry experiments to better elucidate how nightly movements and home-range may differ on different islands, in different habitats, or seasonally. (1)
- d. **Document genetic variability.** Collect genetic data to document variability, population structure, estimate effective population size, and provide information about population dynamics. (1)
- e. **Conduct population modeling.** Obtain and use demographic information to develop population models, including population viability analyses. (2)

#### 2. Goal: Identify limiting factors.

Understanding the factors that limit the survival and reproductive success of individuals, and therefore determine the distribution, abundance, and growth of populations, is essential for planning conservation actions designed to increase bat population sizes and create net recovery benefits. Potential factors that may limit bat populations include:

- a. **Suitable habitat.** Bats require suitable habitat for foraging, roosting, and breeding. Studies indicate that bats use a wide range of habitats for foraging, but that mature trees may be important for breeding and roosting. Recent studies have documented aspects of habitat use for breeding and roosting, including tree species and architecture. The following research is needed to improve our understanding of suitable habitat. This information will shed light on the question of whether or not bats are habitat limited. Findings that suitable habitat remains unoccupied would suggest that bats are not

habitat limited, that habitat management and restoration would not necessarily result in net recovery benefits, and that other factors may be limiting bat populations.

Objectives include, but may not be limited to:

- i. **Define suitable habitat.** Document aspects of habitat used for foraging, breeding, and roosting, including vegetation community structure, physical attributes, vegetation species used, and tree architecture. (1)
- ii. **Determine relationship of distribution to suitable habitat.** Document bat distribution and presence or absence in suitable habitat to determine whether suitable habitat is unoccupied. (1)
- iii. **Determine relationship of abundance to suitable habitat.** Determine whether aspects of suitable habitat are associated with demography and home range such that bat population densities or growth rates are associated with habitat features. (1)
- iv. **Conduct experimental treatments.** Conduct long term experimental studies (e.g. up to 20 years) in which bat occupancy or abundance is measured in treatment plots designed to increase suitable habitat. Research designed to employ this approach would be expected to require a study of considerable duration, given the long time frames inherent in habitat management and restoration efforts. Several habitat management projects are currently underway, in some cases in which Hawaiian Hoary Bat occupancy was assessed prior to the initiation of management efforts, that may provide opportunities for research consistent with the goals and objectives sought here. Applicants are encouraged to coordinate with current and potential licensees that may have opportunities for such long term research as part of their current mitigation requirements. (1)

**b. Food availability**

Populations may be limited if food resources are variable, scarce, or widely dispersed. Food limitation may impact survival and reproductive success to the degree that populations remain stable or decrease despite the availability of suitable habitat and lack of other threats. The following research objectives may contribute to a better understanding of food limitation.

- i. **Identify diet.** Understand food habits by analyzing fecal samples to provide information on foraging ecology, nutritional needs, and population ecology. (1)
- ii. **Document prey selection.** Determine which prey taxa are selected or preferred by comparison of diet to food availability. (1)
- iii. **Determine relationship of home range to food availability.** Conduct studies in which food availability is measured within the home ranges of bats and determine whether a correlation exists. (2)
- iv. **Document relationship of food availability to survival and reproductive success.** Conduct studies in which food availability is monitored within and among years to determine whether survival and reproductive success are correlated with food availability. (2)
- v. **Conduct experimental treatments.** Conduct experimental studies in which bat demography, occupancy, or abundance is estimated in treatment plots designed to increase food availability. As with objective 2.a.iv. above, this research may require a study of considerable duration, and may be carried out as a part of a study pursuant to that objective, in order to explore the potential relationship between habitat suitability, food availability, and bat population dynamics. (2)

- c. **Pesticides.** Pesticide use in agricultural or other areas may place bats at risk to exposure, with resulting impacts on impact growth, survival, or reproductive success.
  - i. **Survey and analyze contaminate loads in bats.** (1)
  - ii. **Conduct surveys for chemical residues on bat prey.** (2)
  - iii. **Determine whether demographic variables are correlated with pesticide loads.** (2)
  - iv. **Determine whether high pesticide use areas are associated with low bat occupancy.** (2)

**d. Predators**

Predation may limit populations if bat pups or adults are subject to frequent predation events and high predator populations. Predator impacts on Hawaiian hoary bat are largely unknown. The following research may contribute to a better understanding of predatory relationships to bat populations.

- i. **Bat breeding roost monitoring.** Conduct intensive monitoring at roost sites to observe the outcome of pups during the period they are non-volant. (2)
- ii. **Investigation of potential predator's food preferences (e.g. barn owl).** Analyze potential predators' consumed prey items through analyzing pellets, stomach contents, etc. (2)

**3. Goal: Research and development**

- a. **Develop methods for assessing long term population trends.** Statistically robust methods for the detection of long term population trends are currently thought to be cost-prohibitive at relevant spatial scales. Efforts are needed to develop more cost effective methods to carry out state-wide long term population monitoring. (1)
- b. **Develop methods for the estimation of abundance.** Methods for the estimation of bat population levels are currently not available. Efforts are needed to develop and implement such methods in order to inform population models that can be used to understand population status, risk, and sensitivity to incidental take and other threats. (2)

**4. Goal: Other**

The committee will consider submitted proposals that address goals and objectives other than those listed here if those proposals are consistent with the purpose of this request and are likely to yield information that will be used to contribute to the conservation of the Hawaiian Hoary Bat.

**IV. Guidance**

The committee encourages submission of proposals that include any combination of the goals and objectives above to develop the most cost effective project to provide information consistent with the purposes of this request. We strongly recommend that proposals include suites of objectives that will result in the completion of a study that will effectively address a stated goal with statistical confidence within five years. For example, it is the intention of the committee that this request result in support for a proposal that will result in the completion of a study to statistically infer whether suitable habitat limits the distribution and abundance of Hawaiian Hoary Bats on Hawaii, Maui and/or Oahu. Similarly, the committee seeks to support a proposal that will result in statistical inference regarding the role of food availability in regulating populations of the Hawaiian Hoary Bat on Hawaii, Maui, and/or Oahu. Such a study or studies would require that multiple objectives above be addressed in a logical and biologically meaningful order so that each may inform the others as appropriate. Interested parties may

submit more than one proposal. We are especially interested in understanding population status and limiting factors for the Hawaiian Hoary Bat on Hawaii, Maui and Oahu, since a number of incidental take authorizations, and requests for such, currently exist, but notes that certain aspects of information concerning the ecology and life history of bats may be obtained on any of the main Hawaiian islands.

The committee also notes that there are a number of licensees that are currently engaged in mitigation projects pursuant to approved HCPs for the Hawaiian Hoary Bat, and that opportunities may exist to improve the cost effectiveness of research proposals through collaborative efforts among the responsible parties.

## **V. Proposal Requirements**

To be considered for funding under this funding opportunity, an application must contain the following, and must not exceed 20 pages in length, including cover page, project summary, figures and tables, an itemized budget, and supplemental information. Proposals submitted with a font size less than 11 pt. will not be accepted.

1. Cover letter signed by the authorized representative of the applicant addressed to:

Endangered Species Recovery Committee  
Hawaiian Hoary Bat Request for Proposals  
C/O Kate Cullison  
1151 Punchbowl Street, Room 325  
Honolulu, HI 96822  
[Katherine.Cullison@Hawaii.gov](mailto:Katherine.Cullison@Hawaii.gov)  
(808) 587-4148

2. Project Narrative
  - a. Summary: A summary of the proposed project that addresses the purpose of this request, outlines goals, objectives, strengths, implications for management, and the total budget (broken down by year, if applicable).
  - b. Goals: Identify the goals consistent with those listed above. Clearly indicate how the proposed research relates to specific priority research identified above. Discuss expected results and outcomes and how the information gained will be used in practice pursuant to the purpose of the request.
  - c. Objectives: Identify the objectives consistent with those listed above. Clearly indicate how the proposed research relates to specific priority research identified above.
  - d. Tasks and Activities: State the proposed project activities, and describe how they relate to the stated project objectives. Include specific, measurable tasks. Include a description of the problem and proposed research to address that problem, including the ways in which it addresses one or more priorities. The proposed project activities narrative must be detailed enough for reviewers to make a clear connection between the proposed activities and the proposed project costs.
  - e. Outputs: Identify the data and informational outputs expected that will constitute the results of the proposed research and accomplish the research goals and objectives.

- f. Outcomes: Discuss the outcomes of the research in relation to the purpose of the request. Identify how the research will inform future management planning efforts.
  - g. Materials and Methods: Provide a detailed description of the method(s) to be used to carry out each activity, including experimental design, statistical methods, the number and types of equipment or devices used for the project, including detection, capture, tracking, or monitoring, and specific sites or areas to be used.
  - h. Timetable and Milestones: Provide a timetable indicating when activities or project milestones are to be accomplished. Include any resulting tables, spreadsheets or flow charts within the body of the proposal narrative (do not include as separate attachments). The timetable should not propose specific dates but instead group activities by month for each month over the entire proposed project period. Timeline activities should include obtaining permits and landowner permission, field time, data analysis, report writing, data management and delivery, and preparation of publications(s).
  - i. Permits and Authorizations. All participants of funded projects must procure all necessary Federal, State, and local permits, and landowner permissions prior to project initiation. Identify any and all permits and permissions needed or in possession, and status and progress on obtaining such, as appropriate.
  - j. Monitoring and Evaluation: Describe procedures that will be employed to monitor the progress of the project and ensure that targets are being met, and procedures to establish and implement corrective actions needed. Describe how findings will be fed back into decision making and project activities throughout the project period.
  - k. Organization(s) and Key Personnel: Provide a brief description of the applicant organization and all cooperating entities and/or individuals. Identify which of the proposed activities each agency, organization, group, or individual is responsible for conducting or managing the project. Provide complete contact information for individual within your organization that will oversee/manage the project activities on a day-to-day basis. This is the person commonly referred to as the Project Officer or Project Manager. Provide brief (1-2 pages) *curricula vitae* for key personnel, identifying their qualifications to meet the project objectives. *Do not include Social Security numbers, the names of family members, or any other personal or sensitive information on the curricula vitae!* Contributed CVs will not count against the 20 page limit.
  - l. Literature Cited: as appropriate
3. Budget
- a. Table of budget categories, including as appropriate, but not limited to:
    - i. Personnel
    - ii. Fringe benefits
    - iii. Travel
    - iv. Equipment
    - v. Supplies
    - vi. Subcontracts with detailed budget
    - vii. Other costs
    - viii. Indirect charges

Budget Justification. Explain and justify all requested budget items/costs. Detail how the category totals were determined and demonstrate a clear connection between costs and the proposed project activities. For personnel salary costs, include the base-line salary figures and the estimates

of time (as percentages) to be directly charged to the project. Provide justification for any indirect costs.

#### **VI. Submission requirements**

1. Applicants may submit more than one proposal to address different goals and objectives.
2. Project timelines may not exceed five years, except for those projects that address objectives 2.a.iv. and 2.b.v.
3. Submission deadline: July 15, 2016
4. Method: via E-mail or regular post to:

Endangered Species Recovery Committee  
Hawaiian Hoary Bat Request for Proposals  
C/O Kate Cullison  
1151 Punchbowl Street, Room 325  
Honolulu, HI 96822  
[Katherine.Cullison@Hawaii.gov](mailto:Katherine.Cullison@Hawaii.gov)  
(808) 587-4148

#### **VII. Review and Selection Process**

A panel of biologists serving at the request of the committee will review the proposals and recommend projects for further consideration. Proposal rank will be based the relevance of the proposal with respect to the purpose of the request, relevance to the priority goals and objectives listed above, how well the proposal addresses the requirements listed in V. above, the timeliness of the proposed work, likelihood of successfully achieving the anticipated results, the significance of the contribution of the project to the research needs, and cost in relation to the research activities undertaken and anticipated results. Minimization of overhead and other indirect costs is encouraged, as is contribution of matching funds or in-kind services that will increase the cost-effectiveness of the project. Documentation of justification of any indirect charges included in the budget must be provided. Following review, applicants may be requested to revise the project scope and/or budget for consideration of a best and final proposal. Successful applicants will receive written notice of the recommendation. Applicants whose projects are not recommended will receive written notice, most often by e-mail, within 30 days of the final review decision.

#### **VIII. Recommendations**

Upon completion of the review process, the committee will transmit its findings and recommendations as to which, if any, proposals warrant support to licensees requiring approved mitigation opportunities to meet their legal obligations under state law. Contracts for services established based on the recommendations made pursuant to this request must be made between the applicant and the licensee. The committee does not guarantee that funds will be awarded based on those recommendations.

## **VIII. Reporting and Data Delivery**

Reporting and data delivery requirements and recommendations are provided in the Hawaiian Hoary Bat Guidance Document (ESRC 2015). Reporting and data delivery requirements for research projects credited as mitigation pursuant to an approved HCP include annual interim performance and financial reports due August 1 of each year, that includes a description of activities and accomplishments, analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the research proposal, areas needing technical advice, status of funding, and plans and management objectives for the next fiscal year, including any proposed modifications thereto. Annual reports should include a presentation by the principle investigator at the first official meeting of the committee after August 1 of each year, or as soon as is practicable.

Contracts for research projects credited as mitigation pursuant to an approved HCP, established between the license holders and contractors, are expected to include rigorous practices for financial and performance accountability. Reports should contain a comparison of actual accomplishments with the goals and objectives of the award, as detailed in the approved research proposal, and a description of reasons why established goals were not met, if appropriate. Final reports should be delivered within 90 days from the end date of the project and include a summary or abstract, introduction, methods, results, discussion, conclusions, and literature cited written in research manuscript format suitable for peer review distribution, and delivery of final budget details and all data resulting from the project, including full metadata documentation that includes description of all data fields and data domains, as well as data collection or analysis process step documentation. Final contract payments should be made upon receipt of the final reports and data.

## **IX. Inquires**

Direct inquiries to:

Kate Cullison

[Katherine.Cullison@Hawaii.gov](mailto:Katherine.Cullison@Hawaii.gov)

(808) 587-4148

## **VIII. Reference**

Endangered Species Recovery Committee. 2015. Hawaiian Hoary Bat Guidance Document.  
<http://dlnr.hawaii.gov/wildlife/esrc/hhb/>