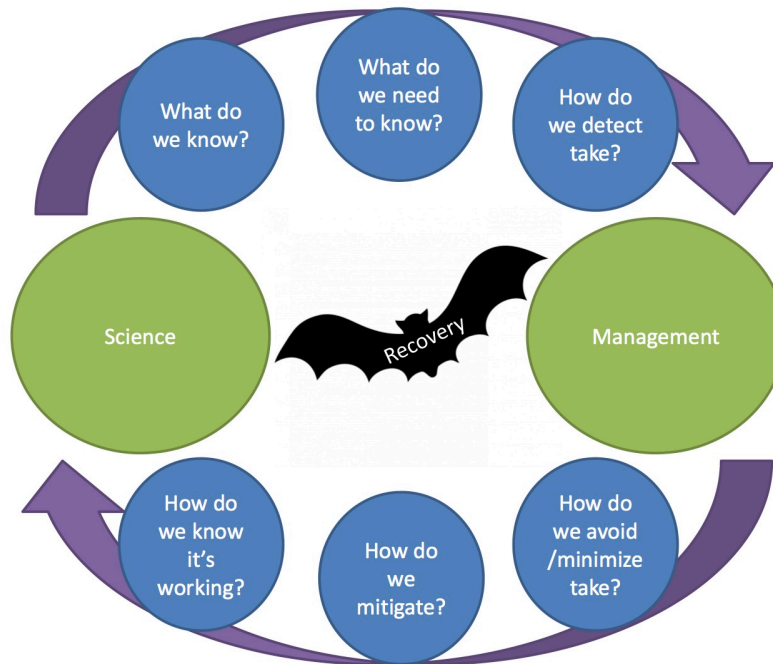


Hawaii Endangered Species Recovery Committee

Bat Workshop

April 14-15, 2015 9:00am – 5:00pm

East-West Center, John A. Burns Hall, Room 3121 & 3125
1601 East-West Road, Honolulu, HI 96848



The State of Hawai‘i Department of Land and Natural Resources Division of Forestry and Wildlife (DLNR-DOFAW) is pleased that you are participating in the Endangered Species Recovery Committee Hawaiian hoary bat management workshop. The objective of the workshop is to help guide the Endangered Species Recovery Committee (ESRC) in making recommendations specific to impacts on the Hawaiian hoary bat or ‘Ōpe‘ape‘a (*Lasiurus cinereus semotus*) in the development of state Habitat Conservation Plans (HCP). Under Hawai‘i Revised Statute Chapter 195-D, the ESRC was established to consult the Board of Land and Natural Resources on matters relating to endangered, threatened, proposed, and candidate species. HCPs may authorize the take of endangered, threatened, proposed, and candidate species so long as the take is incidental to an otherwise lawful activity and authorized by the Board. Applications and proposals are thoroughly reviewed by the ESRC and undergo public review.

To date, six Incidental Take Licenses (ITL) for the Hawaiian hoary bat have been approved in the state of Hawai‘i, and more applications are currently under development and/or consideration by DLNR-DOFAW. Take assessment and mitigation for the species has varied significantly between projects largely due to lack of biological information available at the time of ITL issuance. This workshop is an opportunity for experts working in a variety of sectors to provide guidance on the development of management recommendations by the ESRC in consideration of the unique challenges presented by the endangered Hawaiian hoary bat.



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

CARTY S. CHANG
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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INTERIM FIRST DEPUTY

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ACTING DEPUTY DIRECTOR - WATER

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

ENDANGERED SPECIES RECOVERY COMMITTEE MEETING

DATE: April 14 and 15, 2015
TIME: 9:00 a.m.
PLACE: Hosted by Study of the US Institutes on Global Environmental Issues, Rooms 3121 and 3125, John A. Burns Hall, East-West Center, 1601 East-West Road, Honolulu, HI 96848
PARKING: Daily parking is available on campus at a rate of \$5.00 per day. Maps are located on Pages 4-5 of this Agenda.

AGENDA¹

APRIL 14, 2015

- ITEM 1.** **Call to order.** 9:00 – 9:15 am
Introduction of Committee members.
Format and goals of workshop.
- ITEM 2.** **Overview of current knowledge and status of the Hawaiian hoary bat.** 9:15 – 9:45 a.m.
Frank Bonaccorso, US Geological Survey
- ITEM 3.** **Wind Take Avoidance.** ESRC recommendations on avoidance measures, viability of deterrent technology currently or soon to be available and if/how research on deterrent technologies are credited. 9:45 a.m. – 12:00 p.m.
- ITEM 3.a.** Curtailment.
- Curtailment Practices: Cris Hein, Bat Conservation International
 - Smart Curtailment: Dave Johnston, H.T. Harvey & Associates
- ITEM 3.b.** Bat Deterrent Technology.
- Effectiveness and Timeline: Cris Hein, Bat Conservation International
 - Human-safe Ultraviolet Light Deterrence: Marcos Gorresen, Hawai'i Cooperative Studies Unit, UH Hilo

¹ Please note all times are approximate

- ITEM 4. Wind Take Monitoring.** ESRC recommendations on preferred methods of take detection or credit for research on developing new technologies. 1:00 – 2:00 p.m.
- Post Construction Monitoring Protocols and Acoustic Monitoring at Four Wind Farms in Hawai‘i: Mitch Craig, SunEdison
 - New Technology including Video, Infrared, and Thermal Imaging: Marcos Gorresen, Hawai‘i Cooperative Studies Unit, UH Hilo
- ITEM 5. Tree Trimming/Harvesting Bat Take Avoidance and Monitoring.** ESRC recommendations on avoidance measures and possible avoidance measures during pupping season. ESRC recommendations on take monitoring and quantification. 2:10 – 4:00 p.m.
- Use of Forward Looking Infrared (FLIR) Systems: Reggie David, Rana Biological Consulting
 - Status of Development of FLIR Protocol to Survey Timber for Bats Prior to Harvest: Dawn Bruns, US Fish and Wildlife Service
 - Estimating take Based on Habitat Characterization: Dave Johnston, H.T. Harvey & Associates
- ITEM 6 Resource Equivalency Analysis.** ESRC recommendation on the use of the REA model, type of research needed to fill model gaps, and potential for mitigation credit. 4:00 – 5:00 p.m.
- Resource Equivalency Analysis (REA) Overview and Gaps: Jaap Eijzenga and Ling Ong, SWCA Environmental Consultants
 - REA Precedent and Path Forward to Utilizing REA Model: Steve Miller and Jodi Charrier, US Fish & Wildlife Service

APRIL 15, 2015

- ITEM 7. Bat mitigation strategies and evaluating mitigation success.** 9:00 – 10:30 a.m.
- Wetland and Forest Restoration as Bat Mitigation: Angela Amlin, State of Hawai‘i Division of Forestry & Wildlife
 - Kahikinui Baseline Acoustic Monitoring Data: Frank Bonaccorso, US Geological Survey
 - Current Methods and Analysis: Corinna Pinzari, Hawai‘i Cooperative Studies Unit, UH Hilo
 - Bat Acoustic Monitoring Portal (BatAMP): Ted Weller, US Forest Service and Corinna Pinzari, Hawai‘i Cooperative Studies Unit, UH Hilo

- ITEM 8. Bridging the gap between science and management: identifying priorities in research as mitigation.** ESRC to identify priority list of what research mitigation funds should target. 10:45 a.m. – 12:15 p.m.
- Priority Research Needed to Fill in Gaps in Ecological Knowledge: Frank Bonaccorso and Marcos Gorresen, Hawai‘i Cooperative Studies Unit, UH Hilo
 - Priority Research to Inform Recovery and Management of the Species: Joy Browning, US Fish and Wildlife Service
 - How Genetics Inform Management: Corinna Pinzari, Hawai‘i Cooperative Studies Unit, UH Hilo
- ITEM 9. Panel Discussion: Determining future mitigation strategies.** 1:15 – 3:30 p.m.
Panel Members: Frank Bonaccorso, US Geological Survey; Joy Browning, US Fish & Wildlife Service; John Vetter, Division of Forestry & Wildlife; Dave Johnston, H.T. Harvey & Associates; Cris Hein, Bat Conservation International.
- ESRC recommendation on most effective conservation measures for mitigation given the current best available science
 - ESRC recommendation on allocation of mitigation funds between research and on-the-ground mitigation
- ITEM 10. Wrap Up / Overview of Workshop Discussions. Adjournment.** 3:30 – 4:00 p.m.

Public may testify on each meeting agenda item. Public may request meeting materials by contacting Afsheen A. Siddiqi at Afsheen.A.Siddiqi@hawaii.gov (808) 587-0010.

If you desire to attend the meeting and require auxiliary aids (taped materials or sign language interpreter) please request assistance five business days prior to the meeting by calling or writing the Division of Forestry and Wildlife at (808)587-0166; Division of Forestry and Wildlife, 1151 Punchbowl Street, Room 325, Honolulu, Hawai‘i, 96813.

ESRC Bat Workshop Speakers

Angela Amlin

Protected Species HCP Associate
State of Hawai'i - Division of Forestry and Wildlife
Pacific Cooperative Studies Unit

Angela Amlin is a Protected Species Habitat Conservation Planner with the State of Hawai'i Division of Forestry and Wildlife. Her work focuses primarily on the impacts of alternative energy projects on threatened and endangered species, particularly seabirds, waterbirds, and bats. She received her Master of Environmental Management with a concentration in Conservation Science and Policy from Duke University in 2008. Angela has previously worked for the World Wildlife Fund, California State Parks, and spent many years with the ecology group of environmental consulting firm ERM, Inc. doing impact assessment and planning.

Frank J. Bonaccorso, Ph.D.

Wildlife Ecologist
Pacific Island Ecosystems Research Center
U. S. Geological Survey/BRD

Frank J. Bonaccorso is a specialist in the ecology of mammals with a focus on bats of the world. His current research includes ecology and distribution of the Hawaiian Hoary Bat and using infra-red technology to examine bat activity at wind turbines.

Dawn Bruns

Acting Assistant Field Supervisor, Section 7 & HCPs
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office

Joy Browning

Biologist
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office

Mitchell Craig

*Hawaii HCP Manager
SunEdison*

Mitchell Craig, Hawaii HCP Manager, SunEdison, is the HCP implementation manager for the four SunEdison operated Hawaii wind sites. Oversight includes state and federal HCP regulator liaison,

HCP mitigation implementation co-management, wind turbine generator oriented systematic downed wildlife searching and retrieval by both human and canine observers, carcass persistence and searcher efficiency studies, mammalian predator control to reduce carcass scavenging, intensive vegetation maintenance to improve searcher efficiency and fatality estimation using most current methods and software. Mitch also manages portable weather station and bat detector implementation and detection record analysis and summary at all sites including over 150 bat detector units on the ground and at nacelle height. Past employment: Hawaiian monk seal population research field team leader 1987-2000, Caribbean “king” crab open system mariculture research 1984-1986. BS Zoology 1984.

Reginald David
Rana Biological Consulting, Inc.

Marcos Gorresen
Hawai'i Cooperative Studies Unit
University of Hawai'i at Hilo

master's at Texas Tech University on deforestation impacts to bat communities, and has been a researcher since 2001 with the Hawai'i Cooperatives Studies Unit of the University of Hawai'i at Hilo. He is presently involved in studies of native Hawaiian bird population trends and distribution, and has over the past several years been investigating bat behavior at wind turbines on the mainland and in Hawai'i. Other recent bat-related research has involved the use of long-term acoustic sampling networks at island scales and tests of the potential of ultraviolet light to deter bats from areas such as wind turbines.

Cris Hein, Ph.D.
Director, Wind Energy Program
Bat Conservation International

Marcos Gorresen is an ecologist with training and experience in a broad range of topics including the distribution, abundance and habitat associations of vertebrates, and the design and analysis of environmental monitoring. He completed his

Cris Hein is the Bats and Wind Energy Program Director for Bat Conservation International (BCI) and the Program Coordinator for the Bats and Wind Energy Cooperative. Cris received his M.S in

Biology from Texas State University in 2001, and his Ph.D. in Forestry and Natural Resources from the University of Georgia in 2008. Cris has been studying bat behavior and ecology for 16 years and bats and wind energy issues for 8 years. Prior to working with BCI, Cris was the lead bat biologist for ABR, Inc. Environmental Research and Services.

Dave Johnston, Ph.D.
Associate Wildlife Ecologist & Bat Biologist
H.T. Harvey & Associates - Ecological Consultants

Dave Johnston worked on the foraging ecology of bats for his Ph.D. under Brock Fenton at York University in Toronto. Just prior to starting his Ph.D., he surveyed for insects in native 'Ohi'a

forests and eucalyptus groves on Kaua'i while visiting Hawai'i state entomologist, Dean Jamieson. More recently Dave was the Principal Investigator for Hawaiian hoary bat roosting and foraging studies on Oahu for First Wind (now SunEdison). Dave also assisted with the design and monitoring plan for the 'Uko'a Wetland for Hawaiian hoary bat mitigation. Last year Dave worked with the Hawai'i Forestry Industry Association and agency personnel to avoid take of the Hawaiian hoary bat during eucalyptus harvesting practices. For the past five years Dave has been studying impacts to bats and birds at large scale wind and solar facilities. Dave has on-going bat projects in California, Hawai'i, Mexico, and Belize. He is currently a board member of the North American Society for Bat Research (NASBR). He has numerous publications and has been featured in "Nature," "Quest," and BBC public broadcast television productions. Dave founded two nature centers in California and has led ecotourism trips in many parts of the southwest, Mexico, Peru, and Ecuador.

Stephen E. Miller, PhD
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Strategic Habitat Conservation Division

Ling Ong, Ph.D
Marine and Wildlife Scientist
SWCA Environmental Consultants

Ling Ong has more than 15 years' experience with terrestrial and marine ecological studies in the tropics. She has conducted conservation research in tropical forests encompassing behavioral ecology of forest birds and waterbirds. She also conducts acoustic and visual surveys for bats. She completed her doctoral studies on parrotfish ecology at the University of Hawai'i. At SWCA, Dr. Ong is the lead in conducting intertidal and marine surveys. Dr. Ong also provides scientific expertise in the field of terrestrial wildlife ecology, including technical advice to help clients comply with the Endangered Species Act, and developing sustainable environmental practices. She has specific expertise with the design and conduct of long-term bird and bat population studies. She has conducted multi-agency consultations on behalf of clients and co-authored and successfully permitted three multi-species HCPs.

Corinna A. Pinzari
Bat Research Supervisor
Hawai'i Cooperative Studies Unit
University of Hawai'i at Hilo
USGS Kilauea Field Station

Corinna Pinzari is the lead bat research technician with the Hawaii Cooperative Studies Unit, and has been part the USGS research team since 2008. She has assisted with studies into the biology, ecology, and behavior of Hawaiian hoary bats; with specific emphasis on developing and deploying acoustic survey methods and techniques to document the echolocation activity of bats across the state. She is also currently a graduate student at University of Hawaii at Hilo, in the Tropical Conservation Biology and Environmental Science program. Her thesis research focuses on the population genetic structure and morphology of Hawaiian hoary bats.

Diane Sether, Ph.D.
Alternative Energy Coordinator
Hawaii and Maui Nui Geographic Team
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office

Diane Sether is a retired Researcher and Graduate Faculty from University of Hawaii at Manoa where she served over 20 years teaching and conducting research in the molecular virology and vector entomology fields. She has worked for the Service for a little over three years and has served as an Invertebrate and Recovery Biologist, Section 7 Biologist, and presently as the Alternative Energy Coordinator for the Maui Nui and Hawaii Geographic Team. Her alma mater mascots spanning Bachelors through Doctorals are duck, duck, beaver, beaver, bow. And she like dark beer.

John P. Vetter

Forest Bird Recovery Coordinator
Hawaii Department of Land & Natural Resources
Division of Forestry and Wildlife

John Vetter is a Wildlife Biologist for the State of Hawaii Division of Forestry and Wildlife based out of the Honolulu office. His primary duties are to coordinate recovery efforts for the multitude of endangered forest birds and for the Hawaiian

Hoary Bat across the state. Originally from Ohio, he has been working in Hawaii for over eight years on Maui, the Big Island, and now Oahu.

Theodore J. Weller

Ecologist
Conservation of Biodiversity
Forest Service
Pacific Southwest Research Station

Ted Weller is an Ecologist with the USDA Forest Service, Pacific Southwest Research Station in Arcata, California. Ted has worked with bats since 1996 and has published 11 papers on them in the peer-reviewed scientific literature. His research has largely focused on methodological issues and

survey effort necessary to describe bat activity and characterize species assemblages and population status at multiple spatial scales. Ted has been involved with issues surrounding bats and wind energy on several fronts since 2005. Since 2007 he has partnered with Iberdrola Renewables, the California Energy Commission, and Bat Conservation International to model bat activity and fatalities at wind energy facilities in southern California. His current work focuses on understanding behavior and ecology of migratory tree bats using tools ranging from on-line data portals to hands-on field work conducted in the redwood forests of northwest California where he lives.

Campus Food Options (www.manoa.hawaii.edu/food)

