



Activity #3

Rain Forest Birds Research Projects

● ● ● Class Period One *Discussion and Research Topics*

Materials & Setup _____

For each student

- Student Page “Rain Forest Birds Research Projects: Topics and Resource List” (pp. 30-35)

Instructions _____

- 1) Students will be doing independent research projects on topics related to birds in Hawaiian rain forests, including the rain forest on Haleakalā. Brainstorm a list of topics or questions students find interesting. Students may select topics from that list or come up with another of their own choosing. Use the Student Page “Rain Forest Birds Research Projects: Topics and Resource List” in class to help spark students’ thinking, or hand it out to students at the end of class.
- 2) You will need to set the parameters for these research projects, such as:
 - How long students will have to do their research;
 - When they will need to hand in a research plan, including the question they are researching and sources of information (this research plan will help keep their projects on track and enable you to help students target their efforts);
 - How students will present their findings (options include a research paper, class presentation, poster display, or multimedia presentation); and
 - How research and presentations will be evaluated.

Note _____

- Depending upon the needs of your students, you may need to schedule some class time to help students refine their research questions, identify more sources of information, or develop reports.

Assessment Tools _____

- Research plans
- Research reports or presentations



Rain Forest Birds Research Projects: Possible Topics and Resource List

There are many interesting research topics having to do with native birds in Hawaiian rain forests. This background sheet suggests a handful of topics for which information is readily available. Then it lists many written and internet resources for research, linking them with these topics. It also lists useful sources of general background information.

Possible Research Topics

1) **Basic biology and natural history of a particular family, genus, or species of birds**

Several species and families of native Hawaiian birds have been thoroughly studied. You could select one or more species, a genus, or even the whole family of honeycreepers, and learn about them in depth. You may also learn about topics such as co-evolution, in which native plant and bird species evolved together with special adaptations that are beneficial to both.

2) **Human-caused changes: Habitat alteration and introduced species**

From the time that Polynesians first settled on the Hawaiian Islands, people have been changing the environment in which native Hawaiian birds live. You could study how humans have changed bird habitat—or specific habitats such as the *koa* forest—and what has happened to native bird species as a result. Or you could study the threats that introduced species pose to native birds.

3) **Avian (bird) malaria as a threat to native bird species**

Early in the 1900s, nonnative birds that carried a disease called avian malaria were brought to the Hawaiian Islands by people. Avian malaria is transmitted to native birds by a nonnative mosquito. You could learn more about this disease, how and why it threatens native birds, how it is spread, and the possible relationship between pig rooting, mosquito reproduction, and the spread of avian malaria. You could also explore why native birds seem to escape infection at elevations above 1200 meters (3936 feet), and how this might change because of global warming.

4) **Bird catching and hunting and the cultural significance of birds in traditional Hawaiian society**

In Hawaiian society, birds were hunted and captured for a variety of reasons, including as a source of food and feathers. Bird catchers played an important role in this culture. You could learn more about how and why Hawaiians caught birds, which species were prized, and what is known about the effects of bird hunting and catching on populations of native birds. You could also learn about the cultural significance of different bird species to native Hawaiians.



5) Extinction of Hawaiian bird species

Throughout the Pacific Islands, it is estimated that more than 2000 species of land birds became extinct after human settlement. You could learn more about what scientists know about extinct native birds based on historical records and the recovery of partially fossilized bird remains from sand dunes, lava tubes, caves, and sinkholes. You could also explore causes of extinction and why native Hawaiian birds were so susceptible to the pressures that came along with human settlement of the islands.

6) Efforts to protect or revive threatened and endangered native bird species

Today, there are many efforts to protect native bird species that are in danger of extinction. You could learn about how species are classified as threatened or endangered, which Hawaiian species are so classified, and what is being done to protect one or more of these species.



Resources for Research: A Beginning List

Sources of Information (Print)	General Information	Bird Biology and Natural History	Human-cause changes	Avian malaria	Bird catching & cultural significance	Extinction	Protecting bird species
<p>Berger, A. J., <i>Hawaiian Birdlife</i>, 2nd ed., University of Hawai'i Press, Honolulu, 1981. This is an extensive resource; common Maui birds are covered on pp. 127-170.</p>	•	•	•	•	•	•	•
<p>Berger, A. J., <i>Bird Life in Hawai'i</i>, Island Heritage Publishing, Aiea, Hawai'i, 1996. This book gives a one- to two-page description and color drawing for each bird and discusses habitat alteration and non-native birds on pp. 7-8, 42-70.</p>		•	•		•	•	
<p>Carlquist, Sherwin, <i>Hawai'i, A Natural History</i>, Pacific Tropical Botanical Garden, Kaua'i, Hawai'i, 1980. In chapter 11 (p. 190-212) a section on the honeycreepers and other birds covers life history, diet, nest descriptions, threats such as avian malaria, and sketches.</p>		•					
<p>Hawai'i Audubon Society, <i>Hawai'i's Birds</i>, Hawai'i Audubon Society, Honolulu, 1997. For each bird species there is a one- to two-page description about the bird's distribution, description, voice, and habits. The introduction talks about dispersal to the Hawaiian Islands, evolution, extinction, and other notes.</p>	•	•			•		
<p>Juvik, S. P., and J. O. Juvik (eds.), <i>Atlas of Hawai'i</i>. 3rd ed., University of Hawai'i Press, Honolulu, 1998. "Birds" section by Sheila Conant (pp. 130-134) includes basic background, an insert on extinction, a discussion of honeycreepers and adaptation to food sources, and an overview of human impacts (avian malaria, non-native organisms). "Alien Species and Threats to Native Ecology" section by F. R. Warshauer (pp. 146-149) provides an overview of species introductions, including a look at the rate of introduction, types of organisms, and impact. "Biogeography" section by J. O. Juvik (pp. 103-106) provides an overview of means of dispersal of land plants and animals to Hawai'i.</p>	•		•	•		•	
<p>Medeiros, A. C., and L. L. Loope, <i>Rare Animals and Plants of Haleakala National Park</i>, Hawai'i Natural History Association, Hawai'i National Park, Hawai'i, 1994. Overview about birds in Hawai'i includes rare birds found in Haleakalā National Park, extinctions, and adaptive radiation. Provides specific information on three birds in the rain forest: the crested honeycreeper, parrotbill, and <i>nukupu'u</i>.</p>	•	•				•	



Sources of Information (Print)	General Information	Bird Biology and Natural History	Human-cause changes	Avian malaria	Bird catching & cultural significance	Extinction	Protecting bird species
<p>Stone, C. P., and L. W. Pratt, <i>Hawai'i's Plants and Animals: Biological Sketches of Hawai'i Volcanoes National Park</i>, University of Hawai'i Press, Honolulu, 1994. For the common forest birds, this book gives one to two pages of information including life history, description, distribution, value to Hawaiians, current threats, and drawings. Addresses avian malaria on pp. 214-215, 271.</p>		•		•	•	•	•
<p>Kepler, A. K., <i>Hawaiian Heritage Plants</i>, Oriental Publishing Co., Honolulu, 1984. Discusses lobelias and bird catching, pp. 80-83; bird catching, chants, feather capes, pp. 107-111; 'elepaio pp. 69-73; and palila pp. 86-88</p>					•		
<p>Pukui, M. K., and S. H. Elbert, <i>Hawaiian Dictionary</i>, University of Hawai'i Press, Honolulu, 1986. Definitions of different types of bird catchers and methods used: <i>kau manu</i>, <i>kia manu</i>, <i>kapili manu</i>, <i>kono manu</i>, <i>la au kia</i></p>					•		
<p>Kamehameha Schools Bernice Pauahi Bishop Estate, <i>Life in Early Hawai'i: The Ahupua'a</i>, 3rd ed., Kamehameha Schools Press, Honolulu, 1994. Bird catching is addressed on pp. 16, 28, 43.</p>					•		
<p>Kepler, C. B., and A. K. Kepler, <i>Haleakala: A Guide to the Mountain</i>, Mutual Publishing, Honolulu, 1988. Common birds seen at Hosmer Grove, pictures & brief descriptions, pp. 33-34</p>		•					
<p>Freed, L. A., S. Conant and R. C. Fleisher, "Evolutionary Ecology and Radiation of Hawaiian Passerine Birds," in Kay, E. A. (ed.), <i>A Natural History of the Hawaiian Islands, Selected Readings II</i>, University of Hawai'i Press, Honolulu, 1994, pp. 335-345. This is a summary of research and findings on adaptive radiation in Hawaiian passerine birds, focusing on Hawaiian honeycreepers.</p>	•	•					
<p>Attenborough, D., <i>The Life of Birds</i>, BBC Books, London, England, 1998. This is a general reference book on bird behaviors and biology, including flightlessness, feeding, mating and rearing young. Although not specific to Hawaiian species, this book provides background, context and examples from all over the world.</p>	•						



Sources of Information (Internet)	General Information	Bird Biology and Natural History	Human-cause changes	Avian malaria	Bird catching & cultural significance	Extinction	Protecting bird species
U.S. Geological Survey, "Status and Trends of the Nation's Biological Resources: Hawai'i and the Pacific Islands" at <biology.usgs.gov/s+t/SNT/noframe/pi179.htm>.	•	•	•	•		•	
U.S. Geological Survey, "Hawaii's Environment Benefits from Geographic Isolation" at <hvo.wr.usgs.gov/volcanowatch/1999/99_03_18.html>.				•			
"Hawaii's Endangered Species" at <naalehuel.k12.hi.us > Student pages include a site about endangered species created by students.		•		•		•	•
U.S. Fish and Wildlife Service, "Threatened and Endangered Species" at <pacificislands.fws.gov/wesa/endspindex.html>. Site about threatened and endangered species in the Pacific, including Hawaiian plants and animals	•	•				•	•
"Researchers at Zoo Work to Save Hawaiian Birds from Extinction," (<i>Molecular Genetics: Research Reports</i> No. 93, Summer 1998) at <www.si.edu/researchreports/9893/birds.htm>.	•		•	•			
"Searching for Hope in the Family Tree," (<i>National Wildlife</i> , April/May 1998) at <www.nwf.org/natlwild/1998/honey.html>.				•			
Hawai'i Biological Survey at <hbs.bishopmuseum.org/hbsl-navbar-0.html>. Includes information about endangered and threatened species						•	
Bryant, Peter J., "Islands, Chapter 12 in Biodiversity and Conservation, A Hypertext Book" at <darwin.bio.uci.edu/~sustain/bio65/lec12/b65lec12.htm# Diseases>.	•		•			•	
"Extinction and Biodiversity" at <www.teaching-biomed.man.ac.uk/bs1999/bs146/biodiversity/Extinction.html>. Not Hawai'i or bird-specific	•					•	
Hawai'i Natural Heritage Program at <www.abi.org/nhpl/us/hi/iiwi.htm> ('i'iwi life history) < www.abi.org/nhpl/us/hi/pbill.htm> (Maui parrotbill life history)		•					



Sources of Information (Internet)	General Information	Bird Biology and Natural History	Human-cause changes	Avian malaria	Bird catching & cultural significance	Extinction	Protecting bird species
Smithsonian Institution, "Iiwi Life History" at < www.si.edu/organiza/museums/zoo/zooview/exhibits/birdhs/iiwi.htm >.		•					
"Hawaii's Endemic Birds" at < biology.usgs.gov/s+t/noframe/t018.htm >.	•	•	•	•		•	•
"National Geographic On-Line Index" at < www.nationalgeographic.com/publications/explore.html >.	•						