Submittal Review Response

Project Name:	***Hilo WWTP Rehabilitation and Replacement Project Phase 1***
Submittal No.:	***01150.-01.0***
Date:	***4/28/2025***

Client:	County of Hawai‘i	**Carollo Project No.:**	203975
Contractor:	Nan, Inc.		
Submittal Name:	Wildlife Biologist Qualifications		
Reviewed By:	Gavin Goo		

SUBMITTAL REVIEW		
Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.		
Approved	☒	No Exceptions
	☐	Make Corrections Noted - See Comments
	☐	Make Corrections Noted - Confirm
Not Approved	☐	Correct and Resubmit
	☐	Rejected - See Remarks
Receipt Acknowledged	☐	Filed for Record
	☐	With Comments - Resubmit

Review Comments:

1. No additional comments.

CONTRACTOR SUBMITTAL TRANSMITTAL FORM

Owner:	County of Hawaii	**Date:**	4/25/2025
Contractor:	Nan, Inc.	**Project No.:**	WW-4705R
Project Name:	WWTP	**Submittal Number:**	01150-001.0
Submittal Title:	Wildlife Biologist Qualifications		
To:	Engineer		
From:	Nan Inc.		

Specification No. and Subject of Submittal / Equipment Supplier			
Spec ##:	01150	**Subject:**	Wildlife Biologist Qualifications
Authored By:	Matthew Chun	**Date Submitted:**	4/25/2025

Submittal Certification

Check Either (A) or (B):

[X] (A) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with no exceptions.

[ ] (B) We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings except for the deviations listed.

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

General Contractor's Reviewer's Signature: Matthew Chun

Printed Name and Title: Matthew Chun, QC Project Engineer

In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.

Firm:	**Signature:**	**Date Returned:**

PM/CM Office Use

Date Received GC to PM/CM:

Date Received PM/CM to Reviewer:

Date Received Reviewer to PM/CM:

Date Sent PM/CM to GC:

Nan, Inc

PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1

JOB NO. WW-4705R

THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED 4/25/2025
SPECIFICATION SECTION # 1150
SPECIFICATION Mitigation and Monitoring Requirements
PARAGRAPH 1.02.C
DRAWING n/a
SUBCONTRACTOR n/a
SUPPLIER n/a
MANUFACTURER n/a

CERTIFIED BY: Matthew Chun

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EDUCATION

Ph.D. Zoology (Ecology, Evolution, and Conservation Biology), 2000
University of Hawai'i, Manoa

B.A. Aquatic Biology, 1985
University of California, Santa Barbara

PROFESSIONAL EXPERIENCE

2015-present	Professor, Department of Biology, University of Hawaii at Hilo
2010 – 2015	Associate Professor, Department of Biology, University of Hawaii at Hilo
2005- 2010	Assistant Professor, Department of Biology**,** University of Hawaii at Hilo
2002-2005	Post-Doctoral Researcher, USGS-BRD, Kilauea Field Station
2001	Lecturer, Department of Zoology, University of Hawaii, Manoa
2000-2001	Lecturer, Department of Biology, University of Hawaii, Hilo
2000 - present	Biological Consultant, Geometrician and Associates
1993-1999	Research Assistant, Department of Zoology, University of Hawaii, Manoa
1991-1993	Teaching Assistant, Department of Zoology, University of Hawaii, Manoa
1992	Instructor, School for Field Studies
1989-1990	Volunteer, United States Peace Corps

GENERAL RESEARCH INTERESTS

I have broad interests in behavioral ecology, community ecology, and conservation of Hawaiian forests and forest birds. The relationships between habitat variables and bird distribution, abundance, and demography as they relate to the conservation of Hawaiian forest birds have been a major theme of much of my past and current research. Most recently, my lab (the UH Hilo Listening Observatory for Hawaiian Ecosystems- LOHE) has two basic research areas, including: 1) the use of bioacoustics to address a variety of questions relating to bird

conservation and behavior in Hawai‘i and the tropical Pacific, and 2) Hawaiian forest and forest bird inventory and monitoring, particularly with respect to climate change. All research projects involve active participation by UH Hilo undergraduate and/or graduate students and these students are often first authors or co-authors on resulting manuscripts. I maintain active collaborations with researchers and natural resource managers at local, national, and international universities and agencies.

RESEARCH PUBLICATIONS (* signifies student co-author)

Navine, A., R.J. Camp, M.J. Weldy, T. Denton, and **P.J. Hart**. 2024. Counting the Chorus: A bioacoustics indicator of population density. Ecological Indicators 169 (2024) 112930.

Navine, A., Paxton, K., Paxton, E., Netoskie*, E., Tysall, E*., and **P. J. Hart**. 2024. Innovative microphone transmitter reveals differences in acoustic structure between broadcast and whisper songs of ‘Ōma‘o (*Myadestes obscurus*). Ornithology (*in press*).

Hunt, N.J.*, T. Ibanez, A. Pack, **P.J. Hart**. 2024. Signal partitioning between native and introduced forest birds of Hawai‘i island. Frontiers in Ecology and Evolution- Population, Community, and Ecosystem Dynamics: DOI 10.3389/fevo.2024.1399455.

Navine, A.K., T. Denton, M. J. Weldy, **P. J. Hart**. All thresholds barred: direct estimation of call density in bioacoustic data. 2024. Frontiers in Bird Science: DOI 10.3389/fbirs.2024.1380636.

Paxton, K.L., J.R. Smetzer, **P.J. Hart**, M.J. Anderson, and E.H. Paxton. 2023. Landscape configuration alters movement behavior and space-use of a Hawaiian forest bird community. Journal of Avian Biology 2023: e03117.

Netoskie*, E. C., K.L. Paxton, E.H. Paxton, G.P. Asner, **P.J. Hart**. 2023. Linking vocal behaviours to habitat structure to create behavioural landscapes. 2023. Animal Behaviour 201:1-11.

Judge, S. W., R.J. Camp, V. Vaivai, and **P.J. Hart**. Status of Landbirds in the National Park of American Samoa. 2022. Pacific Science, 76(2) : 139-156.

Fernandez, N.M.*, K.L. Paxton, E.H. Paxton, A.A. Pack, and **P.J. Hart**. 2022. Landscape configuration influences ‘Ōma‘o (Myadestes obscurus) song diversity. Pacific Science 76:325-335.

Navine, A., S*. Kahl, A. Tanimoto-Johnson, H. Klinck, and **P.J. Hart**. 2022. A collection of fully-annotated soundscape recordings from the Island of Hawai'i (Version 1) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.7078499

Navine, N.*, K.L. Paxton, E.H Paxton, **P.J. Hart**, J.T. Foster, N. McInerney, R.C. Fleischer, E. Videvall. 2022. Microbiomes associated with avian malaria survival differ between susceptible Hawaiian honeycreepers and sympatric malaria-resistant birds. Molecular Ecology: DOI 10.1111/mec.16743.

Kahl, S., A. Navine, T. Denton, H. Klinck, **P.J. Hart**, H. Glotin, H. Goeau, W. Vellinga, R. Planque, and A. Joly. 2022 Overview of BirdCLEF 2022: Endangered bird species recognition in soundscape recordings. CLEEF 2022: Conference and Labs of the Evaluation Forum, September 5-8, 2022.

Smetzer J. R., K. L. Paxton, **P. J. Hart**, E. H. Paxton. 2022. Activity patterns of Hawaiian forest birds in a fragmented and continuous landscape. Journal of Avian Biology 2022:e02905.

Hart, P.J., T. Ibanez, K. Paxton, G. Tredinnick*, E. Sebastián-González, and A. Tanimoto-Johnson. 2021. Timing is everything: Acoustic niche partitioning in two tropical wet forest bird communities. Frontiers in Ecology and Evolution: doi:10.3389/fevo.2021.753363.

Ibanez, T. A. Ainsworth, J. Gross, J.P. Price, E. Webb, and **P.J. Hart**. 2021. Rarity patterns of woody plant species associated with life form and diversification rates in Pacific islands forests. American Journal of Botany 108:1-12.

Burnett, K.*, R.J. Camp, and **P.J. Hart**. 2021. Current distribution and abundance of Kohala forest birds in Hawai'i. Journal of Field Ornithology: DOI 10.1111/jofo.12386.

Judge, S.W., C.C. Warren, R.J Camp, L.K. Berthold, H.L. Mounce, **P.J. Hart**, and R.J. Monello. 2021. Population estimates and trends of three Maui Island-endemic Hawaiian Honeycreepers. Journal of Field Ornithology 92: 1-12.

Gallardo Cruz*, K., K. Paxton, and **P.J. Hart**. 2021. Temporal changes in songbird vocalizations associated with helicopter noise in Hawaii's protected natural areas. Landscape Ecology, 36:1-15.

Wang, A*., E.H. Paxton, H. Mounce, and **P.J. Hart**. 2020. Divergent movement patterns of adult and juvenile `Akohekohe, an endangered Hawaiian Honeycreeper. Journal of Field Ornithology 91:1-8.

Ibanez T., J. Gross, **P.J. Hart**, A. Ainsworth, J. Mallinson, and R. Monello. 2020. Spatio-temporal patterns of alien invasion in one of the last pristine wet forests of Hawai`i. Pacific Science 74:1-20.

Oñate-Casado* J., E. Sebastián-González, and **P.J. Hart**. 2020. Response of male Elepaio, *Chasiempis sandwichensis*, to conspecific songs: a small-scale playback study. Ardeola 67:387-400.

Kawasaki* M., **P.J. Hart,** and E.H. Paxton. 2020. Frequent use of upland habitats by the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*). Waterbirds 42:431-438.

Hart, P.J., T. Ibanez, S. Uehana*, and J. Pang-Ching*. 2020. Forest regeneration following ungulate removal in a montane Hawaiian wet forest. Restoration Ecology. https://doi.org/10.1111/rec.13116.

Ibanez, T. and **P.J. Hart**. 2020. Spatial patterns of tree recruitment in a montane Hawaiian wet forest after cattle removal and pig population control. Applied Vegetation Science 2020;00:1-14. https://doi.org/10.1111/avsc.12478.

Ibanez, T, **P.J. Hart**, A. Ainsworth, J. Gross, and R. Monello. 2019. Factors associated with alien plant richness, cover, and composition differ in tropical island forests. Diversity and Distributions. DOI:10.1111/ddi.12989.

Paxton KL, Sebastián-González E, Hite JM, Crampton LH, Kuhn D, **Hart PJ.** 2019. Loss of cultural song diversity and the convergence of songs in a declining Hawaiian forest bird community. Royal Society Open Science 6:190719. http://dx.doi.org/10.1098/rsos.190719.

Camp R. J., D. A. LaPointe, P. J. Hart, D. E. Sedgwick, and L. K. Canale. 2019. Large-scale tree mortality from Rapid Ohia Death negatively influences avifauna in lower Puna, Hawaii Island, USA. Condor 121:1-16.

van Dyk*, K., K.L. Paxton, **P.J. Hart**, and E. H. Paxton. 2019. Seasonality and prevalence of pollen collected from Hawaiian nectarivorous Birds. Pacific Science 73:187-197.

Sebastian-Gonzalez, E., R.J. Camp, A. Tanimoto, P. Monteiro de Oliveira*, B. Barreto- Lima*, T. Marques, and **P.J. Hart**. 2018. Density estimation of sound producing animals using single automated acoustic recorders and distance sampling. Avian Conservation and Ecology 13(2):7.

Samuel, M.S., B. Woodworth, C. Atkinson, **P.J. Hart**, and D. LaPointe. 2018. The epidemiology of avian pox and interaction with avian malaria in Hawaiian forest birds. Ecological Monographs 88: 621-637.

Deichmann, J., O. Acevedo Charry, L. Barclay, Z. Burivalova, M. Campos Cerqueira, F. d'Horta, E. Game, B. Gottesman, **P.J. Hart**, A. Kalan, S. Linke, L. Do Nascimento, B. Pijanowski, E. Staaterman, T. Aide. 2018. It's time to listen: there is much to be learned from the sounds of tropical ecosystems. Biotropica 50: 709-712.

Judge, S. W., R. J. Camp, **P. J. Hart**, and Kichman, S. T. 2018. Population estimates of the Endangered Hawai'i 'Akepa (*Loxops coccineus*) in different habitats on windward Mauna Loa. Journal of Field Ornithology 89(1):11-21

Sebastian-Gonzalez, E., J. van Aardt, K. Sacca, J. Magalhaes Barbosa, D. Kelbe, and **P. J. Hart**. 2018. Testing the acoustic adaptation hypothesis with native and introduced birds in Hawaiian forests. Journal of Ornithology. DOI 10.1007/s10336-018-1542-3

Tanimoto, A.M* and **P.J. Hart**. 2018. ʻAkekeʻe (*Loxops caeruleirostris*) foraging techniques: targeting psyllid nymphs in ʻōhiʻa galls. Elepaio 78:1-3.

Hart, P.J., E. Sebastiàn-Gonzàlez, A. Tanimoto, A. Thompson*, T. Speetjens*, M. Hopkins*, and M. Atencio-Picado*. 2018. Birdsong characteristics are related to fragment size in a neotropical forest. Animal Behavior 137: 45-52.

Pang-Ching*, J., **K.L. Paxton**, E.H. Paxton, A.A. Pack, and **P.J. Hart**. 2018. The effect of isolation, fragmentation, and population bottlenecks on song structure of a Hawaiian honeycreeper. Ecology and Evolution: DOI:10.1002/ece3.3820

Sebastiàn-Gonzàlez, E. and **P.J. Hart**. 2017. Birdsong meme diversity in a fragmented habitat depends on landscape and species characteristics. Oikos 126: 1511-1521.

Tanimoto*, A.M., **P.J. Hart**, A.A. Pack, R. Switzer, P.C. Banko, D.L. Ball, E. Sebastian-Gonzalez, L. Komarczyk, and M.H. Warrington. 2017. Changes in vocal repertoire of the Hawaiian Crow, *Corvus hawaiiensis*, from past wild to current captive populations. Animal Behavior 123:427-432.

Ben, T*., **P.J. Hart**, and G. Helle 2017. Towards Establishing a New Environmental Archive-Annual Growth Periodicity, Stable Carbon Isotope Variability and Reconstruction Potential of ʻAkoko (*Euphorbia olowaluana*), A Native Hawaiian Tree with C, Photosynthetic Pathway. Erdkunde 71(1):77-9.

Gaudioso-Levita, J.M*., **P.J. Hart**, D.A. LaPointe, A.C. Veillet, and E. Sebastian-Gonzalez. 2017. Biogeographical variation of plumage coloration in the sexually dichromatic Hawai'i ʻAmakihi (*Chlorodrepanis virens*). Journal of Ornithology DOI 10.1007/s10336-017-1453-8.

Tanimoto, A.M*., **P.J. Hart**, A.A. Pack, and R. Switzer. 2017. Vocal Repertoire and Signal Characteristics of 'Alala, the Hawaiian Crow (*Corvus hawaiiensis*). The Wilson Journal of Ornithology 129: 25-35.

Sebastian-Gonzalez, E., J. Pang-Ching*, J.M. Barbosa, **P. J. Hart**. 2015. Bioacoustics for species management: two case studies with a Hawaiian forest bird. Ecology and Evolution 5(20): 4696-4705.

Francisco, K.S*., **P.J. Hart**, J. Li, E.R. Cook, and P.J. Baker. 2015. Annual rings in a native Hawaiian tree, *Sophora chrysophylla*, on Maunakea, Hawai'i. Journal of Tropical Ecology 31:567-571.

Hart, P.J., R. Hall*, W. Ray*, A. Beck*, J. Zook. 2015. Cicadas impact bird communication in a noisy tropical rainforest. Behavioral Ecology 26:839-842.

Samuel, M. D., B. L. Woodworth, C. T. Atkinson, and **P. J. Hart**. Avian malaria in Hawaiian forest birds: infection and population impacts across species and elevation. Ecosphere 6 (6) 104. http://dx.doi.org/10.1890/ES14-00393.1.

Aslan, A*., **P. J. Hart**, J. Wu*, and C. E. Aslan. 2014. Evaluating the qualitative effectiveness of a novel pollinator: a case study of two endemic Hawaiian plants. Biotropica 46:732-739.

VanZandt, M., D*. Delparte, **P. J. Hart**, F. Duvall, and J. Penniman. 2014. Nesting characteristics and habitat use of the endangered Hawaiian Petrel (*Pterodroma sandwichensis*) on the island of Lanai. Waterbirds 37:43-51.

Wu, J. X*., D. M. Delparte, and **P. J. Hart**. 2014. Movement patterns of a native and non native frugivore in Hawaii and implications for seed dispersal. Biotropica 46:175-182.

Hart, Patrick, M.F. Ramos-Ordoñez, C. Rodríguez-Flores, C. Soberanes-González, B. Behrstock, M.C. Arizmendi, and D. Mehlman. 2013. Orange-billed Sparrow (*Arremon aurantiirostris*), Neotropical Birds Online (T. S. Schulenberg, Editor). Cornell Lab of Ornithology, Ithaca, New York.

Sridhar, H., U. Srinivasan, R.A. Askins, J. Canales-Delgadillo, C. Chen, D. N. Ewert, G. A. Gale, E. Goodale, W. K. Gram, **P. J. Hart**, K. A. Hobson, R. L. Hutto, S. W. Kotagama, J. L. Knowlton, T. M. Lee, C. A. Munn, S. Nimnuan, B. Z. Nizam, G. Peron, V. V. Robin, A. D. Rodewald, P. G. Rodewald, R. L. Thomson, P. Trivedi, S. L. Van Wilgenburg, and K. Shanker. 2012. Positive relationships between association strength and phenotypic similarity characterize the assembly of mixed-species bird flocks worldwide. American Naturalist 180:777-790.

Hart, P.J. 2012. Patterns of tree mortality in a monodominant tropical forest. Tropical Forests. P. Sudarshana (Ed.) ISBN: 978-953-51-0255-7.

Camp, R. J., S. W. Judge, **P. J. Hart**, G. Kudray, J. M. Gaudioso, and B. H. Hsu. 2012. Birds in Hawaii Volcanoes National Park: Summary of the 2010 Inventory and Monitoring Program Survey. `Elepaio 72: 1-5.

Samuel, M. D., P. H. F. Hobbelen, F. DeCastro, J. A. Ahumada, D. A. LaPointe, C. T. Atkinson, B. L. Woodworth, **P. J. Hart**, and D. C. Duffy. 2011. The dynamics, transmission, and population impacts of avian malaria in native Hawaiian birds: a modeling approach. Ecological Applications 21(8): 2960-2973.

Hart, P. J., B. L. Woodworth, R. Camp, K. Turner, K. McClure, K. Goodall, Henneman, C. Spiegel, J. LeBrun, E. Tweed, and M. Samuel. 2011. Bird and resource variability across an elevational gradient in Hawaii. The Auk 128:113-126.

Hart, P.J. 2010. Tree growth and age in an ancient Hawaiian wet forest: vegetation dynamics at two spatial scales. Journal of Tropical Ecology 25:1-11.

Tucker-Mohl, K., **P. J. Hart**, and C. Atkinson. 2010. Can lowland dry forests represent a refuge from avian malaria for native Hawaiian birds? Pacific Conservation Biology 16:181-186.

Flaspohler, D.J., C. Giardina, G.P. Asner, **P.J. Hart**, J. Price, C.K. Lyons*, and X. Castaneda*. 2009. Long-term effects of fragmentation and fragment properties on bird species richness in Hawaiian forests. Biological Conservation 143:280-288.

Gaudioso, J.M., D.A. LaPointe, and **P.J. Hart**. 2009. Knemidokoptic mange in Hawai`i `Amakihi (*Hemignathus virens*) on the Island of Hawai`i. Journal of Wildlife Disease 45:497-501.

Eggert, L.S., L.A. Terwilliger, B.L. Woodworth, **P.J. Hart**, D. Palmer, and R.C. Fleischer. 2008. Genetic structure along an elevational gradient in Hawaiian Honeycreepers reveals contrasting evolutionary responses to avian malaria. BMC Evolutionary Biology 8:315.

Zimmerman, N., R.F. Hughes, S. Cordell, **P.J. Hart**, H.K. Chang, D. Perez, R.K. Like, and R. Ostertag. 2008. Patterns of primary succession of native and introduced plants in lowland wet forests in Eastern Hawai'i. Biotropica 40: 277-284.

Boelman, N.T., G.P. Asner, **P.J. Hart**, and R.E. Martin. 2007. Multi-trophic invasion resistance in Hawai`i: bioacoustics, field surveys, and airborne remote sensing. Ecological Applications 17(8): 2137-2144.

Foster, J. T., B. L. Woodworth, L. E. Eggert, **P. J. Hart**, D. Palmer, D. C. Duffy, and R. C. Fleischer. 2007. Genetic structure and evolved malaria resistance in Hawaiian Honeycreepers. Molecular Ecology 16: 4738-4746.

Spiegel, C., **P.J. Hart**, B. Woodworth, E. Tweed, and J. LeBrun. 2006. Distribution and abundance of forest birds in low altitude habitat on Hawai'i island: evidence for range expansion of native species. Bird Conservation International 16:175-185.

Tweed, E.J., M. Gorresen, T. Pratt, and **P.J. Hart**. 2006. Forest bird inventory of the Kahuku Unit of Hawaii Volcanoes National Park. Inventory and Monitoring Program, Pacific Islands Network.

Woodworth, B.L., C.T. Atkinson, D.A. LaPointe, **P.J. Hart**, et al. 2005. Host population persistence in the face of introduced vector-borne diseases: Hawaii amakihi and avian malaria. Proceedings of the National Academy of Sciences 102:1531-1536.

Hart, P.J. and L.A. Freed. 2004. Predator avoidance as a function of flocking in the sexually dichromatic Hawaii Akepa. Journal of Ethology 22: 190-196.

Hart, P.J. and L.A. Freed. 2003. Structure and dynamics of mixed-species flocks in a Hawaiian rainforest. The Auk 120: 82-95.

Klein, A., **P.J. Hart**, K. Stumpf, E. Tweed, C. Henneman, C. Spiegel, J. LeBrun, K. McClure, and B. Woodworth. 2003. Nests of 'Amakihi near sea-level on Hawaii island. Elepaio 63:67-68.

Hart, P.J. 2001. Demographic comparisons between high and low density populations of Hawaii Akepa. In J.M. Scott, S. Conant, and C. vanRiper III. (editors). Studies in Avian Biology 22:185-193.

PRESENTATIONS and INVITED SEMINARS (since 2005)

Hart, P.J. *Towards automated monitoring of forest bird density and abundance in Hawai'i.* Bioacoustalk- Cornell Lab of Ornithology Center for Conservation Bioacoustics (invited speaker), Dec. 11, 2024.

Hart, P.J. Acoustic ecology and conservation of Hawaiian forests birds (invited speaker), UH Hilo CNHS Colloquium, Dec. 6, 2024.

Hart, P.J. *Conservation Bioacoustics: Towards automated monitoring of forest bird*

communities in Hawai'i (invited speaker), Hawai'i Festival of Birds, Hilo, HI. Oct. 26, 2024.

Hart, P.J. *Towards automated acoustic monitoring of forest birds in Hawai'i*. Hawai'i Conservation Conference, Honolulu, Hawai'i, July 29, 2024.

Hart, P.J. *Towards automated monitoring of forest bird communities in Hawai'i*. Hawai'i Ecosystem Meeting, UH Hilo, July 8, 2024.

Hart, P.J., *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, Mānoa Heritage Society monthly meeting (invited speaker), April 18, 2024

Hart, P.J., *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, UH Mānoa NREM seminar (invited speaker), Feb. 28, 2024

Hart, P.J., *Kanikuamauna*, 'Imiloa Planetarium, Feb 25, 2024

Hart, P.J., *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, PI-CASC meeting (invited speaker), Feb. 21, 2024

Hart, P.J., *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, UH Hilo TCBES Seminar (invited speaker), Jan. 19, 2024

Hart, P.J., 2023. *Kanikuamauna*, Hawai'i Festival of Birds, Hilo, HI

*'*Ahuimanu and **Patrick Hart***, O Ka Lele a Nei 'Āuna* (opening protocol), Hawai'i Festival of Birds, Hilo, HI Oct. 21, 2023

Hart, P.J., 2023. *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, Hawaii Audubon Society annual meeting (invited speaker)

Hart, P.J., 2023. *Acoustic Ecology and Conservation of Hawaiian Forest Birds*, Cornell Lab of Ornithology (invited speaker).

Hart, P.J. 2023. Towards automated acoustic monitoring of forest bird communities in Hawaii. Hawai'i Ecosystem Meeting, Hilo Hawai'i.

Hart, P.J. 2022. Establishment of an early warning system for mosquito outbreaks at Hakalau Forest NWR. Hawai'i Ecosystem Meeting, Hilo Hawaii.

Hart, P.J. and Taopouri Tangaro. 2022. 'Ōlelo Manu and Oli Kānaka: Exploring Bird Language for Hawaiian Chant (invited speaker). World Oli Movement Keynote Address.

Hart, P.J. and Taopouri Tangaro. 2022. Kani Manu & Oli Kānaka, Connecting the Language of Birds and Chant (invited speaker). TCBES Symposium Keynote address.

Hart, P.J. and Taopouri Tangaro. 2021. Changes through space and time in the kani of manu

and kani of kānaka in Hawai‘i (invited speaker), World Oli movement presentation.

Hart, P.J. 2020. Bioacoustics in animal conservation. UH Mānoa Natural Resources and Environmental Management seminar, Honolulu HI.

Hart, P.J. 2020**.** Foraging and disease ecology of Hawaiian Honeycreepers: an evolving story. Natural History of Hawaii (BIOL 156) course, UH Hilo

Hart, P.J. 2020. Ecology and behavior of dry forest birds on Hawaii island (invited speaker), Wiliwili Festival, Waikoloa, Hawaii.

Hart, P.J. 2019. Differences in the use of acoustic space by birds in two montane tropical forests. American Ornithological Society Annual Meeting, Anchorage Alaska.

Hart, P.J. 2019**.** Ecology and behavior of dry forest birds on Hawaii island. Dry Forest Symposium, Hilo, Hawaii.

Hart, P.J. 2019**.** Hawaiian Honeycreepers, mosquitos, and introduced disease: an evolving story. Natural History of Hawaii (BIOL 156) course, UH Hilo.

Hart, P.J. 2019**.** Song variability in Hawaiian forest birds. Hawaii Bird School, Keauhou, Hawaii.

Hart, P.J. 2018**.** A new method for estimating the density of animals using a single acoustic recorder. Hawaii Ecosystem Meeting, Hilo, Hawaii.

Hart, P.J. 2018**.** The effect of habitat fragmentation on birdsong in a neotropical forest. Association for Tropical Biology Meeting, Kuching Malaysia.

Hart, P.J. 2017. Biogeography of Hawaiian bird song memes in a naturally fragmented Landscape. Association for Tropical Biology and Conservation Annual Meeting, Merida, Mexico.

Hart, P.J. 2017. Biogeography of Hawaiian bird song memes in a naturally fragmented Landscape. Hawaii Ecosystem Meeting, Hilo, Hawaii.

Hart, P.J. 2015. Twenty years of regeneration following ungulate removal in an ancient Hawaiian wet forest. Association for Tropical Biology and Conservation Annual Meeting, Honolulu, Hawaii.

Hart, P.J. 2015. Conservation Bioacoustics in Hawaii: from birds to whales. USDA Institute for Pacific Islands Forestry monthly seminar, Hilo, Hawaii.

Hart, P.J. 2015. Twenty years of regeneration following ungulate removal in an ancient Hawaiian wet forest. Hawaii Conservation Conference, Hilo, Hawaii

Hart, P.J. 2015. Song variability in Hakalau forest birds. Friends of Hakalau annual meeting,

Hilo, Hawaii.

Hart, P. J. 2014. Effects of cicadas on bird communication in a noisy tropical forest. Association for Tropical Biology and Conservation Annual Meeting, Cairns Australia.

Hart, P. J. 2014. Effects of cicadas on bird communication in a noisy tropical forest. Hawaii Ecosystem Meeting, UH Hilo

Hart, P. J. 2014. Backyard birds of Hilo: Past, present, and future. Lyman Museum monthly seminar series, Hilo, Hawaii.

Hart, P. J. 2014. Tree growth and age in ancient Hawaiian forests: evidence from tree rings. Hawaii Dry Forest Symposium, Kailua-Kona, Hawaii

Hart, P. J. 2013. Vegetation dynamics in ancient Hawaiian forests. UH Hilo Senior Seminar

Hart, P.J. (2013-present). Conservation Bioacoustics in Hawaii. Biology Department Senior Seminar

Hart, P. J. 2011. Decline of vocal repertoire in the endangered Hawaiian Crow (Alala). TCBES Symposium. Hilo, Hawaii

Hart, P. J. 2011. First evidence for annual growth rings in a Hawaiian tree. Hawaii Ecosystem Meeting. Hilo, Hawaii

Hart, P. J. 2011. First evidence for annual rings in a native Hawaiian tree: investigating growth dynamics of mamane on Mauna Kea. Hawaii Paleoclimate Workshop, Volcano, Hawaii.

Hart, P. J. 2011. Hawaiian Honeycreepers: an evolving story. UH Hilo North Hawaii Education and Research Center. Honokaa, Hawaii.

Hart, P. J. 2011. Song variability in Hawaiian forest birds. Friends of Hakalau monthly meeting, Hilo, Hawaii.

Hart, P. J. 2011. Hawaiian Honeycreepers: an evolving story. UH Hilo North Hawaii Education and Research Center. Honokaa, Hawaii.

Hart, P. J. 2011. Song variability in Hawaiian forest birds. Friends of Hakalau monthly meeting, Hilo, Hawaii.

Hart, P. J. 2009. Vegetation dynamics in Hawaii. NSF-JAM Annual Meeting, June 10, Washington DC.

Hart, P. J. 2009. Vegetation dynamics in an ancient Hawaiian wet forest: new evidence from Hakalau. UH Hilo TCBES seminar.

Hart, P.J. 2008. Tree age, growth, and death in an ancient Hawaiian wet forest. Hawaii Conservation Conference, July 29, Honolulu, HI.

Hart, P.J. 2008. Tree age, growth, and death in an ancient Hawaiian wet forest. US Forest Service monthly seminar, UH Hilo Biology 495 seminar.

Hart, P.J. 2005. Lowland Wet Forests on Hawaii: Native bird wastelands or arenas for avian evolution? Hawaii Conservation Conference, July 29, Honolulu, HI.

Hart, P.J. 2005. Patterns of nectar availability and honeycreeper abundance across an elevational gradient on windward Hawaii. Annual Meeting of the Cooper Ornithological Society, Arcata, CA.

GRANTS (since 2005, totaling approximately $16,000,000)

- National Park Service (2024). Non-native animal control and research at Haleakalā National Park. **P.J. Hart ($555,763).**
- National Park Service (2024). Non-native animal control to protect endangered Hawaiian Petrel at Haleakalā National Park. **P.J. Hart ($70,000).**
- Hawaii Department of Forestry and Wildlife (2023). Protecting and monitoring endangered seabirds on Maunakea. **P.J. Hart ($85,500).**
- US Dept. Of Interior- USGS (2023). Development of new technologies and techniques to advance wildlife monitoring and improve management of endangered Hawaiian bird species in a changing climate. **P.J. Hart ($308,822.73).**
- Pacific Island Climate Adaptation Science Center- Manager Climate Corps (2022). Development of improved tools to monitor bird abundance and detect climate-change related invasion by mosquitoes into Hakalau Forest NWR. **P.J. Hart ($94,680).**
- National Park Service (2021). Monitoring support and youth development in the Pacific Island Network. **P.J. Hart ($443,975)**
- U.S. Department of Defense (2020). Remote, real-time monitoring of military lands for at-risk species. **P.J. Hart ($159,500)**
- National Park Service (2020). Avian Research and Recovery at Haleakalā National Park. **P.J. Hart ($220,775)**
- Pacific Island Climate Adaptation Science Center (2020). Development of an early warning system for climate-change related invasion by mosquitoes into Hakalau Forest NWR. **P.J. Hart ($136,000).**
- Disney Conservation Fund (2018). Vocal culture of the Hawaiian Crow. K. Paxton and **P.J. Hart ($50,000)**
- NSF-RAPID (2018). Cascading effects of rapid and widespread mortality of a foundation tree species on animal communities in Hawai`i. K. Paxton and **P.J. Hart ($197,000).**

- National Park Service (2018). Front-line training experience for youth in conservation. **P.J. Hart ($257,861).**
- National Park Service (2018). Evaluate status of composition, distribution, and structure of wet forest and subalpine habitat in Pacific Island Parks. **P.J. Hart** (**$281,000**)
- National Park Service (2017). Monitoring wildlife behavior in relation to air tour operations. **P.J. Hart ($70,288).**
- National Park Service (2017). Invasive species research, support, and outreach at Haleakalā National Park. **P.J. Hart ($391,506)**
- Office of Mauna Kea Management (2017). The distribution of native Hawaiian birds and bats within University of Hawaii management areas on Maunakea. **P.J. Hart ($260,000)**
- National Park Service (2016). Landbird monitoring in three National Parks in the Pacific Island Network. **P. J. Hart ($297,000)**
- NSF-CREST (2014). Understanding Biotic Response to Environmental Change in Tropical Ecosystems Through a Place-Based Context D. P. Price, **P. J. Hart**, E. Stacy, and M. Takabayashi **($4,999,999)**
- U. S. Forest Service (2013). Climate change impacts on function of nearshore tropical ecosystems. R. McKenzie and **P. J. Hart ($39,600)**
- National Park Service (2012). Vegetation inventory and mapping support. **P. J. Hart ($515,419)**

- UH Climate Science Center Grant (2013). Reconstructing pre-historic climate variability in Hawaii and the tropical Pacific. **Hart, P. J**., P. Banko, and A. Timmermann **($81,000)**

- National Park Service (2010). Landbird inventory and monitoring. **Hart, P. J**. **($300,426)**

- NSF-CREST (2008). CREST Center in Tropical ecology and evolution in marine and terrestrial environments. Price, D.P., **P.J. Hart**, E. Stacy, and M. Takabayashi. **($4,999,999)**
- National Park Service (2007). Insectivorous Bat Monitoring Protocol Development Assistance. HaySmith, L. and **P.J. Hart ($28,318)**
- UHH EPSCoR REAP Grant (2006) "Using radiocarbon to model the age and growth rates of trees in a Hawaiian rainforest. **P. J. Hart. ($23,500)**
- UHH SEED Grant (2006) "Acoustic competition between native Hawaiian crickets and introduced Coqui frogs. **P. J. Hart ($12,500)**

TEACHING

Courses taught at UH Hilo

Since I began at UH Hilo I have taught 10 different courses, three of which (signified by *) I designed myself. In the past five years, I have primarily taught courses signified by a #.

Biology 101 (Introductory Biology for non-majors)- three semesters
Biology 156 (Natural History of the Hawaiian Islands) – one semester

Biology 280# (Biostatistics)- eighteen semesters
Biology 281# (Ecology)- ten semesters
Biology 281# Lab – eight semesters
Biology 477*# (Avian Biology) – five semesters
Biology 477L* (Field Ornithology) – two semesters
Biology 481 (Tropical Island Ecology and Evolution) – two semesters
Biology 481 Lab – two semesters
CBES 677*# (Quantitative Ecology)- six semesters

Student Evaluations
My course evaluations continue to be consistently above the mean for faculty in both CNHS and the UH System. This is particularly true for Questions 18 (Overall, how would you evaluate this instructor) and 19 (Overall, how would you evaluate this course). I am happy to report that it is quite rare for any student to express a negative opinion about any aspect of my teaching ability, knowledge of subject material, approachability, or content of the courses I teach. Please see links to all electronic Course Evaluation Records for the past three years below.
CESResults-Hart-Fall 2018.pdf, CESResults-Hart-Spring 2019.pdf, CESResults-Hart-Fall 2019.pdf, CESResults-Hart-Spring 2020.pdf, CESResults-Hart-Fall 2020.pdf

COMBINED INSTRUCTIONAL/RESEARCH ACTIVITIES

Undergraduate students:

Research mentor to 100 undergraduate students conducting independent research projects since 2006. Most of these students have worked with me through directed studies projects (BIOL 399 or BIOL 499), or through the PIPES (Pacific Internship Programs for Exploring Science) program here at UH Hilo or the NAPIRE (Native American and Pacific Islander Research Experience) program in Costa Rica. * indicates students under-represented in STEM fields. # indicates students mentored in the past 5 years

Leilani Abaya*	Heather Hart#	William Ray
Christa Amuimuia*#	Aryanna Henthorne*#	Emmalani Reynolds*#
Keion Anderson*#	Madolyn Hopkins*#	Kylie Rich
David Arakawa*#	Iwikauikaua Joaquin*	Kyra Robinson#
Michael Atencio-Picado*#	Kevin Kaneshiro	Ashley Romero*#
Bruna Barreto deLima*#	Mark Kapono*	Timon Skinner*#
Donald Carter#	Lisa Kapono*	Tawn Speetjens*
Heather Chang*	Kimo Keliipaakaua*	Brittany Sung*
Karen Wessells	Julia Kovacs#	Chase Taniyama#
Moana Ching*	Caleb Kow*#	Summa Te Kahikaheemi*#
Alice Clements#	Heather Lee#	Alia Thompson*
Kristi Cook#	Jeremy Levey#	Rheannon Thompson#
Jasmine Curiel*#	Jessica Loeffler#	Emilio Torivio*
Cole Dill-de-Sa*#	Elizabeth Lough#	Grace Tredinnick#
Paul Duya*#	Matt Lucas	Josephine Tupu*#
Kelly Finn#	Agnessa Lundy*	Eirlys Tysall#

Beatriz Fraga*#	Cassie Lyons*	Kealoha Vincent*
Kainana Francisco*	Russ Masuda*#	Magnus Williams#
Billie-Jean Garcia*#	Pricilla Monteiro*#	Shannon Wilson#
Noah Gomes*	Josefa Muñoz*#	Elke Windschitl#
Rachel Grunnill#	Javier Onate Casado*#	Shawna Wolff#
Natalie Hagemann#	Nemesis Ortiz*	Leah Wyzykowski#
Robert Hall*	Kary Perez*#	Linda Xiong*#
Lindsey Hamilton	Nicole Preston#	Robert Yagi*
Molly Harris#	Keiko Publico*	Wade Bennett#
Ruth Gable#	Zachary Anderson Bromley#	Amity Tarter#
Christian Reynolds#	Lili Mahuka-Cummings#*	Marianne Walsh#
Chasity Bae#*	Ava Luciano#	Max Barr#
Katie Cartee#	Keely Rooker#	Nikolai Braedt#
Willow Peterson#	Meeya Odell#*	Braxton Igne#*
Saxony Charlot#	Dustin Smith#	Lillian Lewis#*
Anuhea Strickland#*	Mackenzie Fugett#	Jennipher Himmelmann#
Kili Kawaiaea#*	Olivia Boucher#*	Jadee Mayo#
Amelia McDonald#		

Graduate students:

Primary graduate adviser to 38 TCBES graduate students who have successfully obtained MS degrees (see below).

First Name	**Last Name**	**TCBES Master's Thesis Title**
James	Akau	North Hilo (Hilo Palikū) coastal Fishery Assemblages: Global Climate Change impacts modeled along a highly constrained hydrological and precipitation gradient
Austin	Aslan	Implications of a novel mutualist for fecundity metrics of two endemic Hawaiian plants
Angela	Beck	Variability in the Repertoires and Singing Behavior of Male and Female ʻIʻiwi (*Drepanis coccinea*)
Tishanna	Ben	Investigating the growth periodicity, stable carbon isotope trend and climate reconstruction potential of ʻakoko (E*uphorbia olowaluana),* a native Hawaiian c4 tree on Maunakea, Hawaiʻi, using tree ring analyses
Sam	Brooks	The effects of non-native riparian vegetation on *hihiwai* (*Neritina granosa*) snail ecology in *Honolii* stream, *Hawaii*
Keith	Burnett	Distribution, abundance, and acoustic characteristics of Kohala forest birds
Christina	Cornett	Habitat selection of the endangered Hawaiian Goose: a multi-scale approach
Paulo	Ditzel	Vocal behavior and dialect distribution in an endemic Hawaiian songbird species (*Himatione sanguinea*)
Nicole	Fernandez	Acoustic variability of a native Hawaiian thrush in a fragmented landscape
Kainana	Francisco	Investigating the growth dynamics of māmane (*Sophora chrysophyla*) on Maunakea, Hawaii using radiocarbon dating and classical tree-ring methods

Karen	Gallardo-Cruz	Examining the effect of helicopter noise on native bird and cricket communities in protected natural areas
Jackie	Gaudioso	Biogeographical variation in plumage coloration in the Hawaii amakihi on the island of Hawaii
Noah	Hunt	Investigating signal interaction between introduced and native forest birds in Hawai‘i
Bobby	Hsu	Transfer and effects of maternal anti-*Plasmodium* antibodies in Hawai'i ‘amakihi (*Hemignathus virens virens*)
Thomas	Jones	The relationship between strawberry guava and feral pigs in a Hawaiian wet forest
Seth	Judge	Interisland comparison of behavioral traits and morphology of the endangered Hawaiian Petrel: evidence for character differentiation
Robert	Justice	Using vocalizations to monitor how captive bred ‘alalā (*Corvus hawaiiensis*) are adapting to the wild
Martha	Kawasaki	The urbanization of the Hawaiian Stilt (*Himantopus mexicanus knudseni*): meeting the new neighbors
Erika	Kekiwi	Development of new bioacoustic tools to monitor and better understand populations of two critically endangered bird species on Maui
Chris	Kluzak	Social learning and foraging proficiency of palila (L*oxioides bailleui*) in an aviary setting
Tony	Kovach	Determinants of avian density across a fragmented landscape
Stefan	Kropidlowski	Investigating the efficacy of commercial baits for the control of yellow crazy ants (A*noplolepis gracilipes*) and their impacts on Red-tailed tropicbirds (*Phaethon rubricauda*)
Elizabeth	Lough	Genetic and memetic variability in Hawaiian Pel populations across Hawai‘i island
Daniel	Micros	Targeting Infection at the Source: evaluating the efficacy of semiochemical repellent compounds in the management of rapid ‘ōhi‘a death-associated ambrosia beetles
Kristina	Montoya-Aiona	Roosting Ecology and Behavior of the of the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*)"
Bret	Mossman	Kani a ka `ākiapōla`au
Stephanie	Mladinich	Pockets and pathways to invasion: a comprehensive study on mosquito monitoring methods in high elevation forests on Hawai‘i island
Amanda	Navine	Different cloacal bacteria associated with avian malaria survival in susceptible Hawaiian honeycreeper than sympatric malaria-resistant bird
Erin	Netoskie	Behavioral landscape of ‘Ōma‘o (*Myadestes obscurus*) vocalizations in a naturally fragmented habitat
Joshua	Pang-Ching	Acoustic Variability Among Windward Hawaii ‘Amakihi Populations on Hawaii Island
Corinna	Pinzari	Genetic Variation, Population Structure, and Morphology of an Endemic Bat, Lasiurus cinereus semotus (Chiroptera: Vespertilionidae) Across the Hawaiian Islands
Emma	Stierhoff	Assessing the long-term impacts of chronic infection with avian malaria in Hawai‘i ‘amakihi
Ann	Tanimoto	The vocal repertoire of the ‘ālala (*Corvus hawaiiensis*) during breeding season: a comparison between current captive and past wild populations of the native Hawaiian Crow
Josephine	Tupu	Using Bioacoustics to Understand Native Bird Abundance Across the Elevational Gradient of Hakalau Forest National Wildlife Refuge
Christopher	Todd	Diet of Hawaiian Hoary Bats across an elevational gradient on Hawaii island
Shea	Uehana	Further investigation of the dendrological potential of māmane (Sophora chrysophylla) on Maunakea Hawaii

Katie	vanDyk	Pollination in Hawaiian forest birds
Alex	Wang	Juvenile dispersal and adult home range size of an endangered Hawaiian honeycreeper, the Akohekohe (*Palmeria dolei*)

Committee member for an additional 24 graduate students in the TCBES program. These students are Leayne Patch-Highfil, Cheyenne Perry, Doug Powless, Cary Deringer, Anya Tagawa, Junichi Sugishita, Springer Kaye, Nicole DiManno, Brian Kettl, Seamus Ehrhardt, Riley Bernard, Carly Lowe, Joanna Wu, Marie vanZandt, Julian Dendy, Miya Warrington, Tom McFarlane, Timo Sullivan, Scarlett Kettwich, Matthew Mueller, Genevieve Blanchet, Petrisha Alvarez, Sabina Siddiqui, and Brian Rule

Post-doctoral students:

Post-doctoral advisor or co-advisor for four post-docs, including Esther Sebastian-Gonzalez, Renee Bellinger, Kristina Paxton, and Thomas Ibanez

UNIVERSITY SERVICE

1. **DKICP** DPC committee (2020, 2024)
2. **Chair**, Department of Biology, (2013-2019, 2022-2025)
3. **CNHS Senate Executive Committee Chair** (2022-2024)
4. **UH Hilo Faculty Congress** (2022-2024)
5. **Director**, Listening Observatory for Hawaiian Ecosystems (LOHE) Bioacoustics Laboratory
6. **Associate Director**, TCBES Graduate Program (2016-2019)
7. **Committee member**, College of Natural and Health Sciences Transition Team (2017-2018)
8. **Committee member**, TCBES Executive Committee (2008- 2022).
9. **Committee member,** TCBES graduate student admissions committee (2013-2020)
10. **Committee member**, UH Hilo Academic Advising Task Force (2015)
11. **Committee member**, UH Hilo DPC (2012), TPRC (2016)
12. **Committee member,** TCBES Symposium (2009-2010)
13. **Committee member,** UH Hilo Academic Policy Committee (2006-2007)
14. **Committee member,** Biology Department Faculty Search Committees (6 in total)

PROFESSIONAL SERVICE

1. **Director**, UH Hilo Hakalau Forest Biological Field Station (2009-present)
2. **Delegate**, Organization for Tropical Studies (OTS), (2014-present)
3. **Board member Friends of Hakalau Forest NWR (**2008-2020, 2023-present)
4. **Representative,** Hawaii Natural Area Reserve System Commission (2018-present)
5. **Commissioner,** State of Hawaii Legacy Land Program, (2019-2024)
6. **Committee member,** Hawaii Island Forest Bird Conservation Group (2018-present)
7. **Committee member,** State of Hawaii Endangered Species Recovery Committee

(2008-2016)

8. **Peer Reviewer** (60 manuscripts from a variety of journals)
9. **Primary Counter**, Annual Hawaii Forest Bird Surveys (2001-present)
10. **Biological Consultant** - expertise in the identification of birds and plants across the state of Hawaii (1999-present)
11. **Committee member,** Palamanui Dry Forest Working Group. (2005-2006)
12. **Scientific Resource person**, Organization for Tropical Studies

MEDIA AND OUTREACH

Please see http://lohelab.org/media for a comprehensive list of the media outreach effort being conducted by my lab. In particular, I host a weekly segment on Hawaii Public Radio titled "ManuMinute" (ManuMinute) in which listeners can hear the song of a different Hawaiian bird species each week, along with a short narration about its ecology and conservation. In addition, please see below for a list of articles that feature research and interviews with me and members in my lab:

- KITV video (Dec. 2024- UH researchers use AI to protect native birds in Hawai‘i. KITV interview
- Using AI to study birdsongs (Dec 2024). AI birdsong
- UH researchers use AI, Hawaiian chant to save native birds (Sept 2024) https://www.hawaii.edu/news/2024/12/08/ai-hawaiian-chant-save-native-birds/
- UH Hilo students and alumni present their studies on native birds at statewide conservation conference (August 2024). https://hilo.hawaii.edu/chancellor/stories/2024/08/20/2024-hawai‘i-conservation-conference/
- Ka Leo o ka uluau Episode 12 (Dec 2023). ‘Āhuimanu members join Lei and Drew to share their mele oli, Ka Lele a nei ‘Āuna (in its current form), and to reflect and expand on what was shared this season. https://hilo.hawaii.edu/blog/kaleookauluau/ka-leo-o-ka-uluau-ka-lele-a-nei-‘auna-season-iii-finale/
- 3 years/70 episodes (Oct 2023): UH Hilo biologist Patrick Hart's popular podcast on Hawai‘i native birds marks milestone (. https://hilo.hawaii.edu/chancellor/stories/2023/09/20/patrick-hart-podcast-milestone/
- The need for technology to monitor Hawaiian birds. https://www.youtube.com/watch?v=u2SeTEsZHxU
- Ka leo o ka uluau Episode 8: Manu cultural evolution with Patrick and Lisa (Oct 2023). https://hilo.hawaii.edu/blog/kaleookauluau/ka-leo-o-ka-uluau-cultural-evolution-pat-and-lisa/
- Ka leo o ka uluau Episode 5: Nuku superpower with Patrick and Lisa (May 2023). https://hilo.hawaii.edu/blog/kaleookauluau/ka-leo-o-ka-uluau-nuku-manu-patrick-and-lisa/
- In the race against time to save Hawaiian birds, researchers hope AI gives them an edge (March 2022). https://www.hawaiinewsnow.com/2022/03/10/race-against-time-save-native-birds-researchers-hope-ai-gives-them-an-edge/

- 10K prize to winner of native birdsong coding competition (Feb 2022). https://www.hawaii.edu/news/2022/02/22/native-birdsong-coding-competition/
- UH Hilo biologists publish study on complex ways birds communicate in tropical wet forests. https://hilo.hawaii.edu/chancellor/stories/2021/10/29/hart-biologists-publish-study-bird-communicate/
- The discovery of a Hawaiian Petrel burrow on Maunakea was a culmination of a 3-year effort using radar, acoustics, and night vision technology to survey high elevations of the mauna for remnant seabird populations. The discovery was featured on over 25 media outlets throughout the state. http://lohelab.org/media

- **Environment Hawaii**, June 2020. As Habitat is lost, so too, are the songs of Kauai forest birds. https://www.environment-hawaii.org/?cat=470

- **UH Hilo Stories,** March 2020. Long-term study by UH Hilo scientists shows Hawaii island forests can regenerate once cattle and pigs are fenced out.

- **UH Hilo stories**, Sept 2019. A quieter forest: UH Hilo biologists document loss of birdsong in Hawaiian Honeycreepers on Kauai

- **Big Island Video News,** May 2019. After 50 years of silence, endangered seabird heard on Maunakea

- **Honolulu Civil Beat,** July 2019. This rare island waterbird is becoming citified

- **Mother Jones**, February 2020. The disappearing songs of Hawaii's endangered birds

- **The Atlantic**, March 2020. Hawaiian birds are losing their songs

- **Hawaii's Must-See Lava Flows Are Home to New, Startling Ecosystems** (April 2017)
  http://www.smithsonianmag.com/travel/hawaii-startling-lava-fields-home-new-ecoystems-180962476/?utm_source=smithsoniandaily&utm_medium=email&utm_campaign=20170321-daily-responsive&spMailingID=28333359&spUserID=NzY1MjgwMjE5NDAS1&spJobID=1003034097&spReportId=MTAwMzAzNDA5NwS2

- **UH Hilo Stories: Climate Change Research at UH Hilo: Tree rings and Bird song** (February 21, 2017)
  http://hilo.hawaii.edu/news/stories/2017/02/21/climate-change-research-at-uh-hilo-tree-rings-and-bird-song/

- **American Association for the Advancement of Science (AAAS) Science Update (Podcast): Endangered Crow Calls** (February 15, 2017)
  http://www.scienceupdate.com/2017/02/call/

- **Scientific American 60-Second Science (Podcast): *Hawaiian Crows Ready for the Call of the Wild*** (January 30, 2017)

https://www.scientificamerican.com/podcast/episode/hawaiian-crows-ready-for-the-call-of-the-wild/

- **Science Newsline Biology: *Study indicates 'Alala calls have changed*** (January 26, 2017)
  http://www.sciencenewsline.com/summary/2017012615240100.html

- **Phys.org: *Study indicates 'Alala calls have changed*** (January 26, 2017)
  https://phys.org/news/2017-01-alala.html

- **Honolulu Star-Advertiser: Captive 'Alala's call differs from those in wild, researcher finds** (October 26, 2016)
  https://www.pressreader.com/usa/honolulu-star-advertiser/20161026/281779923669528

- **Tribune Herald: *Calls of the wild: Grants allow research of 'alala vocalizations, and other UH-Hilo projects*** (2016)
  http://hawaiitribune-herald.com/news/local-news/calls-wild-grants-allow-research-alala-vocalizations-other-uh-hilo-projects

- **UH Hilo's new bioacoustics lab is helping revolutionize the field of ecology** (2015)**. *A new algorithm developed by UH Hilo researcher to identify bird songs boasts efficiency and limitless potential for science.***
  http://www.hawaii.edu/news/2015/11/16/uh-hilos-new-bioacoustics-lab-is-helping-revolutionize-the-field-of-ecology/
  full article: http://hilo.hawaii.edu/news/stories/2015/11/12/uh-hilos-new-bioacoustics-lab/

- **Hana Hou, Caw of the Wild** (Hawaiian Airlines magazine, Issue 18.5: October/November 2015)
  https://hanahou.slickage.com/articles/1476

- **Tree Rings on Hawai'i Could Hold New Knowledge About El Niño**
  http://blogs.ei.columbia.edu/2015/08/21/tree-rings-on-hawaii-could-hold-secrets-about-el-nino/

- **People Behind the Science Podcasts (2013)**
  http://www.peoplebehindthescience.com/dr-patrick-hart/

PROFESSIONAL DEVELOPMENT

1. Completed a one-week long statistical modeling workshop using S-Plus software (2006) Boston, MA.
2. Completed a 3-day long course on Bayesian Statistics (2007). Hawaii Volcanoes N.P.
3. Completed a four-day workshop titled "Modeling and estimation based on capture-recapture and occupancy data (2008) USGS-BRD.
4. Completed a one-week long course in Bioacoustic analysis (2009). Cornell Lab of Ornithology, Ithaca New York.
5. Completed a one-week workshop on DISTANCE sampling (2013). University of St. Andrews, Scotland.

COMMUNITY SERVICE

- Host of popular weekly podcast "ManuMinute" that airs every Wednesday on Hawaii Public Radio.
- Leading role in establishment of the 160 acre Palamanui Dry Forest Reserve in Kona, Hawaii (2008).
- Leading role in establishment of the 100 acre Kipuka Umi Wet Forest Preserve, Hawaii (2013-2016).
- Ongoing presentations on Native Hawaiian bird diversity and conservation to the Road Scholars group at the Hilo Hawaiian Hotel.
- Volunteer Bird Guide- Hakalau Forest NWR Open House, 2006-present
- Hawaii Alumni Association- Led Field trip to Hakalau, April 2014
- Conservation Career Day Volunteer, UH Hilo, April 2013-present
- Hilo Water Garden Club (2009) Gave presentation titled "Ancient ohia trees of Hakalau"
- Friends of Hakalau Forest NWR Annual Meeting (April 2009). Gave presentation on "Ancient ohia of Hakalau".
- Gave a presentation to the Hawaii Paradise Park Community Association about the importance of protecting native forest on private property for the preservation of native flora and fauna (Spring 2006)
- Gave presentation to the Hilo Lions Club about Hawaiian Forest Birds (Spring 2006)
- Wrote article for "The Conch", the local Paradise Park Homeowners newsletter, about the importance of protecting native forest on private property for the preservation of native flora and fauna (2006)
- Wrote article "The ancient ohia of Hakalau" for the Friends of Hakalau Forest NWR newsletter
- Wrote article on my research with NAPIRE students in Costa Rica for Amigos Newsletter (2013)

COMMUNITY OUTREACH

I provide support for members of my lab (including postdocs, technicians, graduate students, and undergraduate students) to regularly take part in community outreach events. Please see http://lohelab.org/community-outreach for recent events. Some additional past events are included below:

- Konawaena Middle School 8th grade, November 10, 2020. Ann Tanimoto-Johnson gave interactive virtual presentation titled "Learning about our Hawaiian birds).
- Naalehu 4th Grade bird presentation by Zoom. Patrick Hart, May 1, 2020
- Hawaii Forest Birds STEM exploration day, March 7, 2020. Presenters from our lab included Lisa Mason, Kristina Paxton, Carmelita Villalobos, Timon Skinner, and Ann Tanimoto-Johnson. Activities for students (grades 6-9) included radar and telemetry demos, night vision demos, and bird song spectrogram visualizations and analysis.
- Pu`uwa`awa`a Biocultural Blitz, March 2019. Ann Tanimoto, Karen Gallardo, Erin Netoskie, Patrick Hart. Taught over 100 grade school children from across the island about bird conservation.

- College and Career Summit at Palamanui, March 2019, Ann Tanimoto, Liz Lough, Patrick Hart. (outreach to community college students).
- Keaukaha Elementary Ohana STEM night, April 2019. Ann Tanimoto, Liz Lough, Patrick Hart. (Bird conservation outreach to grade school children)
- Wentworth Hall Monitor Display, March 2019-present. Patrick Hart, Ann Tanimoto. Developed an 18 minute video presentation on the LOHE lab research and students. This is on 24 hour rotation on a monitor in Wentworth Hall, UH Hilo.
- Waikoloa Elementary First grade presentation, 2018. Ann Tanimoto, Patrick Hart. Taught first graders about the importance of bird song.
- UH Hilo College Planning Summit, Sept. 2018. Patrick Hart, Ann Tanimoto. Interacted with over 80 High School students about conservation of Hawaiian birds.
- Hilo Intermediate School, October 5, 2018. Ann Tanimoto, Patrick Hart. Understanding the song of native Hawaiian birds
- Keaau Intermediate School students, October 11, 2018. Ann Tanimoto, Patrick Hart. Identifying Hawaiian birds by their unique vocalizations

- Mountainview library bird-ology presentation (April 2018)
- UH Spring break camp (March 2018)
- Kealakehe Elementary Science Night (March 2018)
- STEM Excite Camp (July 2017)
- Hawaii STEM Conference (May 2017)
- Kealakehe Elementary Science and Art Showcase (February 2017)
- Pahoa Elementary Outreach (January 2017)
- Biocultural Blitz at Puuwaawaa (September 2016)
- Kamehameha Pai Alala Mode for Halau Kupukupu summer camp (July 2016)

PROFESSIONAL SOCIETIES

American Ornithologists Union
Cooper Ornithological Society
Society for Conservation Biology
Wilson Ornithological Society

Note: Ensuing Sheets Contain Project Specifications

SECTION 01150

MITIGATION AND MONITORING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Mitigation and monitoring requirements relating to environmental impacts.

1.02 SUBMITTALS

A. General: Submit data as specified in Section 01330 - Submittal Procedures.

B. Dust control management plan.

C. Qualifications of wildlife biologist performing Hawaiian geese surveys.

PART 2 MITIGATION AND MONITORING REQUIREMENTS FOR ENVIRONMENTAL IMPACTS

2.01 AIR QUALITY

A. Contractor's dust control activities shall comply with the provisions of Hawaii Administrative Rules, § 11-60.1-33 on Fugitive Dust.

B. Contractor shall develop and implement a dust control management plan that identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan shall include, but is not limited, to the following requirements.
   1. All exposed surfaces such as parking area, staging areas, soil piles, graded areas, and unpaved access roads, shall be watered 2 times per day.
   2. All haul trucks transporting soil or other loose material off site shall be covered.
   3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day.
      a. The use of dry power sweeping is prohibited.
   4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
   5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible after grading unless seeding or soil binders are used.
   6. Idling times shall be minimized either by shutting equipment off when not in use or by limiting the maximum idling time to 5 minutes. Clear signage shall be provided for construction workers at all access points.
   7. Construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.
      a. Equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
   8. A publicly visible sign shall be posted with the telephone number and person to contact at the County regarding dust complaints.

C. Contractor shall adhere to all air quality standards. Contractor shall obtain any required air pollution control permits from the DOH Clean Air Branch and comply with all applicable conditions and requirements.

D. Prevent dust nuisance caused by operations, unpaved roads, excavation, backfilling, demolition, or other activities. Whenever visual observation of dust is detected by the Contractor or Engineer outside the property boundary, a dust problem is considered to exist. The Contractor shall take immediate action to alleviate this problem.

2.02 BIOLOGICAL RESOURCES

A. Contractor shall understand that there is a possibility that animals may be present within the construction area. Intentional disturbance of animals present in the construction area is prohibited.

B. Contractor shall follow the current Biosecurity Protocol for Hawaii Island established in the PEP-Environmental Compliance Memorandum No. 20-5 issued by the Office of Environmental Policy and Compliance and Office of Native Hawaiian Relations.

C. Contractor shall not disturb, remove, or trim any woody plants greater than 15 feet tall during the period from June 1 through September 15.

D. Contractor shall not use any barbed wire.

E. Contractor shall not perform any nighttime construction activities during the period from September 15 through December 15.

F. All night-time lighting shall be pointed, adjusted, and shielded to ensure no light escapes in an upward direction or off site.

G. If Hawaiian geese are found to be located on or near to the project site, the Contractor shall comply with the following:
   1. Project personnel shall not approach, feed, or disturb the Hawaiian geese.
   2. If Hawaiian geese are observed loafing or foraging within the project area during the breeding season (September through April):
      a. Contractor shall cease all work immediately.
      b. Contractor shall provide a biologist familiar with Hawaiian geese nesting behavior to survey for nests in and around the project area prior to the resumption of any work. The biologist shall repeat surveys after any subsequent delay of work of 3 or more days.
   3. If a nest is discovered within a radius of 150 feet of the construction site or a previously undiscovered nest is found within the 150-foot radius after work begins, all work shall cease immediately. The Contractor shall contact the Owner for further guidance.
   4. In areas where Hawaiian geese are known to be present, reduced speed limits will be posted by the Owner and enforced. Contractor will be informed of the presence of federally listed species on-stie.

2.03 CULTURAL RESOURCES

A. Contractor shall cease all construction related activities immediately and notify the Engineer upon any cultural resource discoveries, such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, and concentrations of shell or charcoal or artifacts. The Owner would then contact the State Historic Preservation Division who will assess the significance of the find and provide appropriate mitigation measures necessary to implement prior to approval for Contractor to proceed with any construction related activities.

2.04 HAZARDS AND HAZARDOUS MATERIALS

A. As specified in Section 01354 - Hazardous Material Procedures.

2.05 NOISE

A. Comply with noise and work hours regulations by local jurisdiction.

B. In or near inhabited areas, particularly residential, perform operations in manner to minimize noise.

C. In residential areas, take special measures to suppress noise during night hours.

D. Contractor shall comply with noise control and mitigation requirements of the Hawaii State Department of Health Administrative Rules, Title 11, Chapter 46 "Community Noise Control" regulations.

PART 3 EXECUTION (NOT USED)

END OF SECTION