

7 September 2011

Mark Vaught
East Maui Irrigation Company
(808) 579-9516

Dear Mark,

We are interested in applying for access to the Waikamoi Forest Preserve for 22 and 23 September 2011. The purpose of my visit is to collect native Hawaiian insects. The specimens obtained during this trip will be returned to the University of California Berkeley for identification. Some material will be placed in the B.P. Bishop Museum and other specimens will be used for DNA extraction and analysis.

Trip Itinerary

Arrival: 21 September 2011, Hawaiian Airlines #374 at 3:19pm, transfer to Hawaiian Airlines #544 in Honolulu at 4:23pm, arrive Kahului at 5pm

Departure: 24 September 2011, Hawaiian Airlines #543 at 5:28pm, transfer to Hawaiian Airlines #362 in Honolulu at 6:23pm, arrive Hilo at 7:23pm

We plan to be in the field 8am-4pm on the 22nd and 23rd.

Contact information:

Dr. Patrick O'Grady, Associate Professor, Department of Environmental Science, Policy and Management, University of California, Berkeley, CA 94720, email: ogrady@berkeley.edu, cell: (802) 370-9066

Dr. Brian Ort, Postdoctoral Researcher, Department of Environmental Science, Policy and Management, University of California, Berkeley, CA 94720, email: ort@berkeley.edu, cell: [541-602-0454](tel:541-602-0454)

Dr. Kari Goodman, Postdoctoral Researcher, Department of Environmental Science, Policy and Management, University of California, Berkeley, CA 94720, email: rgoodman@berkeley.edu, cell 510-913-2109

Heather Machado, Graduate Student, Department of Ecology and Evolution, Stanford University, Palo Alto, CA email: hmachado@stanford.edu, cell: [503-701-6356](tel:503-701-6356).

Thank you for your assistance. If you require further information, please contact me at (802) 656-0460 or via email: ogrady@berkeley.edu

Sincerely,

Patrick O'Grady



APPLICATION FOR A SCIENTIFIC RESEARCH AND COLLECTING PERMIT

United States Department of the Interior
National Park Service

OMB # (1024-0236)
Exp. Date (02/28/2014)
Form No. (10-741a)

All or some of the information you provide may become available to the public.

Name of the National Park Service area you are applying to: Hawaii Volcanoes NP

Type of application:

Renewal application

Please enter numbers for permit renewal or modification requests:

Previously assigned NPS study number:

HAVO-00312

Previously assigned NPS permit number:

HAVO-2011-SCI-0010

Contact information for the current principal investigator

Principal investigator:

Patrick O'Grady

Office phone:

(510) 642-0662

Mailing address of principal investigator:

University of California, Berkeley
Department of Environmental Science, Policy & Management
Division of Organisms and the Environment

137 Mulford Hall
Berkeley, CA 94720
United States

Alternative phone:

(510) 642-0662

Office fax:

(510) 643-5098

Name of the current institution represented

University of California, Berkeley

Office email address:

ograde@drosophilaevolution.com

Additional investigators or key field assistants (first name, last name, office phone, office email)

Name: jessica craft	Phone: 7605203144	Email: jcraft86@berkeley.com
Name: Gordon Bennett	Phone:	Email:
Name: brian ort	Phone:	Email: ort@berkeley.edu
Name: kari roesch goodman	Phone:	Email:
Name: Gordon Bennett	Phone:	Email:
Name: lisa marrack	Phone:	Email:

Scientific Study Information

Project title (maximum 300 characters)

A Comparative Approach to the Evolutionary Biology of Hawaiian Insects: Population Genetic and Phylogenetic Studies

Purpose of the study (maximum 4000 characters)

Since the early 1960s Hawaiian *Drosophila* have been used as a model system to understand the mechanics of the evolutionary process. Their biogeography is remarkable; it is an example of rapid adaptive radiation on one of the most isolated island systems in the world. The seclusion of this lineage from mainland populations makes it a particular system of importance for further study and comparative analyses. Our research focuses on synthesizing and expanding on the accumulated research from decades of study on Hawaiian *Drosophila* by (1) using phylogenetic approaches to comparatively examine different lineages of endemic Hawaiian insects and (2) focusing on the genetic mechanisms of speciation at the population level.

Examining the pattern, timing, and rate of diversification in other Hawaiian insect groups (*Nesophrosyne* leaf hoppers and *limoniid* craneflies) allows us to infer common evolutionary processes. As an example, a set molecular clock can be compared to phylogenetic

hypotheses of independent Hawaiian lineages to infer information about the time of colonization and rates of speciation. Biogeographic patterns can also allow us to infer how intra-island colonization and subsequent speciation events have proceeded down the island chain. A population genetics approach will also be useful in understanding how species form, particular within large, rapidly evolving lineages.

We will examine seven species of the endemic spoon tarsus clade within Hawaiian *Drosophila* for this study. At less than 500,000 years old, this group is recent compared to other clades of Hawaiian *Drosophila*. The fact that several species seemed to have formed in the past half million years, implies the speciation is either recent or ongoing in this group. By observing the evolutionary forces acting on these populations, we can gain a better understanding of the effect of gene flow, hybridization, and ancestral population size on the diversification process.

Summary of proposed field methods and activities (extract from the study proposal where appropriate - maximum 4000 characters)	
Study Schedule	Field Schedule
Initial starting date of the study: Jun 01, 2009	Date to begin study within the park this application year: Jun 11, 2012
Estimated date the entire study may end: Jul 01, 2014	Date to end study within the park this application year: Jun 11, 2013
	Will field study need to continue within the park next year: Yes
Activity Type: Research	
Do you anticipate receiving funding assistance from the U.S. Federal Government for this study? (Yes or No) Yes If yes specify the agency(s): National Science Foundation	
Where will data, maps, photos, etc. (not specimens) reside upon completion of this study?	
Location(s) where you propose activities will take place within the National Park System area(s): Projected collections will occur at mesic-dry forest habitats and rain forest habitats. Some of these areas include Kipuka puau, Muana Loa road and lookout, Ola'a forest, Escape Road, Napau trail forests, and Pu'u Hululu. Collections may extend beyond these points within the park.	
Your proposed method of access (vehicles, aircraft, boat, snowmobile, foot, etc.): We will access the park via motor vehicle. Collections will be made on foot.	



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Handling or Collection of Specimens

Would you like to handle or collect specimens? Yes

If you respond "Yes", please complete this entire section of the application (otherwise you may skip the remainder of this section).

Scientific description of specimens to be handled or collected (include taxonomic group or name, or type of material; sample size, quantity, frequency, and location):

- Scaptomyza abrupta Maui 15
- Scaptomyza affinicuspidata Maui 15
- Scaptomyza abberans Molokai 15
- Scaptomyza buccata Hawaii, Maui, Molokai, Oahu 15
- Scaptomyza cerina Molokai 15
- Scaptomyza fusciforms Oahu, Kauai 15
- Scaptomyza longisetosa Hawaii, Maui, Molokai 15
- Scaptomyza mutica Maui 15
- Scaptomyza semiflavs Maui, Molokai, Oahu 15
- Scaptomyza stramineifrons Oahu 15
- Scaptomyza anomala Maui, Kauai 15
- Scaptomyza bryanti Hawaii, Maui 15
- Scaptomyza cnecosoma Oahu 15
- Scaptomyza confusa Maui 15
- Scaptomyza hamata Kauai 15
- Scaptomyza palmae Hawaii, Maui, Oahu 15
- Scaptomyza varifrons Oahu 15
- Scaptomyza mauiensis Hawaii, Maui, Molokai, Oahu, Kauai 15
- Scaptomyza pallida Hawaii, Maui, Molokai, Oahu, Kauai 15
- Scaptomyza aloha Molokai 15
- Scaptomyza finitima Oahu 15
- Scaptomyza mediopallens Hawaii 15
- Scaptomyza mitchelli Hawaii 15

Scaptomyza striatifrons Kauai 15
Scaptomyza albovittata Oahu 15
Scaptomyza brunnimaculata Molokai 15
Scaptomyza flavida Molokai 15
Scaptomyza gilvivorilia Maui 15
Scaptomyza nigrosignata Hawaii 15
Scaptomyza varipicta Hawaii 15
Scaptomyza acronastes Oahu 15
Scaptomyza adunca Oahu 15
Scaptomyza affinicuspidata Maui 15
Scaptomyza anechocerca Kauai 15
Scaptomyza apiciguttula Hawaii 15
Scaptomyza apponopusilla Hawaii 15
Scaptomyza agrentifrons Kauai 15
Scaptomyza articulata Hawaii, Molokai 15
Scaptomyza basiloba Hawaii 15
Scaptomyza bilobata Kauai 15
Scaptomyza bipars Kauai 15
Scaptomyza brachycerca Hawaii 15
Scaptomyza camptochaites Maui 15
Scaptomyza concinna Maui 15
Scaptomyza connata Hawaii 15
Scaptomyza cornuta Hawaii 15
Scaptomyza cryptoloba Maui, Oahu 15
Scaptomyza ctenophora Maui 15
Scaptomyza cuspidata Hawaii, Maui 15
Scaptomyza decepta Kauai 15
Scaptomyza denata Kauai 15
Scaptomyza devexa Maui 15
Scaptomyza diaphorocerca Molokai 15
Scaptomyza domita Maui 15

Scaptomyza dubautiae Maui 15
Scaptomyza dubia Molokai, Kauai 15
Scaptomyza eurystylata Hawaii, Maui, Oahu, Kauai 15
Scaptomyza evexa Kauai 15
Scaptomyza exigua Hawaii, Maui 15
Scaptomyza fastigata Hawaii, Maui, Molokai 15
Scaptomyza hacmani Hawaii, Maui, Molokai 15
Scaptomyza hardyi Kauai 15
Scaptomyza inaequalis Hawaii, Maui, Molokai 15
Scaptomyza inermis Hawaii 15
Scaptomyza infurcula Hawaii 15
Scaptomyza innotabilis Kauai 15
Scaptomyza intricata Maui, Molokai 15
Scaptomyza isopedon Hawaii, Maui 15
Scaptomyza kauaiensis Kauai 15
Scaptomyza latitergum Maui 15
Scaptomyza levata Hawaii, Oahu, Kauai 15
Scaptomyza lobifera Hawaii 15
Scaptomyza longipecten Maui, Molokai 15
Scaptomyza mecocerca Kauai 15
Scaptomyza mediana Maui 15
Scaptomyza mimula Molokai 15
Scaptomyza monticola Hawaii 15
Scaptomyza multidentata Hawaii 15
Scaptomyza obscuricornia Maui, Molokai, Oahu 15
Scaptomyza ochromata Maui 15
Scaptomyza ostensa Maui 15
Scaptomyza pallifrons Hawaii, Maui, Molokai, Kauai 15
Scaptomyza paralobe Hawaii 15
Scaptomyza penicula Kauai 15

Scaptomyza photophilia Hawaii 15
Scaptomyza phrysothrix Molokai 15
Scaptomyza protensa Molokai 15
Scaptomyza punctivena Maui 15
Scaptomyza pusilla Hawaii, Maui, Molokai 15
Scaptomyza quadridentata Oahu 15
Scaptomyza recava Hawaii 15
Scaptomyza recta Maui 15
Scaptomyza retusa Molokai 15
Scaptomyza robusta Maui 15
Scaptomyza rotundiloba Oahu 15
Scaptomyza scoliops Oahu 15
Scaptomyza scolopichas Hawaii 15
Scaptomyza setiger Hawaii 15
Scaptomyza setosiloba Hawaii 15
Scaptomyza silcivola Hawaii, Maui, Molokai 15
Scaptomyza spilota Maui 15
Scaptomyza tenuata Hawaii 15
Scaptomyza trivatata Kauai 15
Scaptomyza tumidula Hawaii 15
Scaptomyza uliginosa Hawaii, Maui 15
Scaptomyza umbrrosa Oahu, Kauai 15
Scaptomyza univitta Kauai 15
Scaptomyza vagabunda Oahu, Kauai 15
Scaptomyza varia Hawaii, Maui, Molokai 15
Scaptomyza villosa Kauai 15
Scaptomyza waialealeae Kauai 15

Proposed disposition of specimens identified for handling or collection:

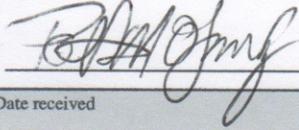
Temporarily retained, then destroyed through analysis or discarded after analysis (If your analysis later determines that temporarily retained specimens or material originating from such specimens in fact warrant permanent retention, contact the park research coordinator for further instructions)

If you propose that specimens and/or material originating from such specimens be retained permanently, they will become part of National Park Service collections. You may request that such specimens and/or material originating from such specimens be loaned to one or more non-NPS institutions for management. If you do make this request, you accept responsibility for obtaining and submitting to NPS the signature of the official at each proposed repository using the form attached as Appendix A. Note that all specimens collected and material originating from such specimens remain Federal property.

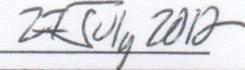
Certification

I certify that this application is accurate and complete. I understand a formal study (research) proposal for new or modified studies must be provided to NPS before this application can be considered. I authorize the National Park Service to seek peer reviews of my proposal.

Signature of principal investigator: _____



Date: _____



For National Park Service use only	Date received	Assigned study number	Assigned permit number
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Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information form is estimated to average 1.38 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3130 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.

Privacy Act Notice: Scientific research, education and collecting activities within units of the National Park System that may impact parks invoke a permitting and reporting requirement per regulations at 36 CFR 1.6 (Permits), 36 CFR 2.1 (Preservation of Natural, Cultural and Archeological Resources), and 36 CFR 2.5 (Research Specimens). The National Park Service collects information about permit applicants and permittees to administer and document research, collecting, and reporting activities within parks. The information disclosed on this form is required and may result in denial of permit applications if not provided.



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United States Department of the Interior
National Park Service

OMB # (1024-0236)
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Form No. (10-741a)

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Would you like to handle or collect specimens? Yes

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Scientific description of specimens to be handled or collected (include taxonomic group or name, or type of material; sample size, quantity, frequency, and location):

Drosophila waddingtoni Hawaii, Maui Nui 70

Drosophila dasyncnemia Hawaii 30

Drosophila septuosa Hawaii 30

Drosophila sordidapex Hawaii 30

Drosophila percnosoma Hawaii 30

Drosophila neutralis Hawaii 30

Drosophila incognita Hawaii 30

Drosophila conformis Hawaii 30

Drosophila mimica Hawaii 15

Drosophila cneucopleura Hawaii 15

Scaptomyza cyrtandrae Hawaii 15

Drosophila imparisetae Hawaii 15

Nesophrosyne affinis Hawaii 10

Nesophrosyne craterigena Hawaii 10

Nesophrosyne ehu Hawaii, Maui 10

Nesophrosyne giffardi Hawaii, Lanai, Oahu 10

Nesophrosyne giffardi interrupta Hawaii 10

Nesophrosyne ignigena Hawaii 10

Nesophrosyne imbricola Hawaii, Lanai 10

Nesophrosyne mabae Hawaii 10

Nesophrosyne montium Hawaii 10

Nesophrosyne montivaga Hawaii 10

Nesophrosyne myrsines Hawaii 10

- Nesophrosyne nuenue Hawaii, Lanai 10
- Nesophrosyne oreadi Hawaii, Oahu 10
- Nesophrosyne pele Hawaii 10
- Nesophrosyne pipturi Oahu, Molokai, Lanai, Maui 10
- Nesophrosyne pluvialis Hawaii, Oahu 10
- Nesophrosyne silvicola Hawaii, Lanai 10
- Nesophrosyne sinuate Hawaii, Oahu 10
- Nesophrosyne touchardii Hawaii, Oahu 10
- Nesophrosyne ulaula Hawaii, Oahu, Maui 10
- Campsicnemus brevitibia Hawaii 5
- Campsicnemus crassipes Hawaii 5
- Campsicnemus dicondylus Hawaii 5
- Campsicnemus setiger Hawaii 5
- Campsicnemus loxothrix Hawaii 5
- Campsicnemus flavipes Hawaii 5

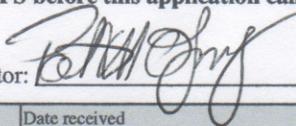
Proposed disposition of specimens identified for handling or collection:

Temporarily retained, then destroyed through analysis or discarded after analysis (If your analysis later determines that temporarily retained specimens or material originating from such specimens in fact warrant permanent retention, contact the park research coordinator for further instructions)

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Signature of principal investigator: 

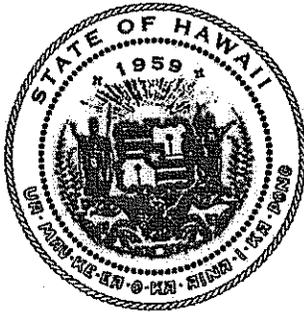
Date: 27 July 2012

For National Park Service use only	Date received	Assigned study number	Assigned permit number
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Natural Resources (3130 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.

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SPECIAL USE PERMIT

NATURAL AREA RESERVES SYSTEM

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, HONOLULU, HI 96813

EFFECTIVE: July, 1, 2011 – July 1, 2013

RESERVES: Manukā, Pu`u Maka`ala, Kahauale`a (currently closed due to volcanic hazard; apply directly to Big Is NARS staff), Laupāhoehoe (need to apply via US Forest Service), Pu`u O `Umi, West Maui (LThau, Panaewa, Honokōwai, Kahakuloa Sections), Pu`u Ali`i, Mt. Ka`ala, Pahole, Ka`ena Point, Ku`ia, Hono O Na Pali

The Board of Land and Natural Resources or its authorized representative, with the approval of the Natural Area Reserves System Commission, hereby issues this Special Use Permit in accordance with Section 195-5, Hawaii Revised Statutes; and Title 13-209-5, Department Administrative Rules, to

Dr. Patrick M. O`Grady, Principle Investigator
Dept. of Environmental Science, Policy & Management
137 Mulford Hall # 3114
University of California Berkeley
Berkeley, CA 94720

Ms. Jessica Craft
Dr. Kari Roesch Goodman
Mr. Gordon Bennett
Dr. Brian Ort
Dr. Richard Lapoint
Ms. Elizabeth Marrack
Dr. Neal Evenhuis, Bishop Museum

Phone: (760) 520-3144 (510) 642-0662

E-mail: jcrafft86@berkeley.edu ogrady@drosophilaevolution.com neale@bishopmuseum.org

to continue to conduct surveys for, and collection of, native arthropods as part of comparative phylogenetic study of Hawaiian arthropods funded by the National Science Foundation. The research takes two main approaches: 1) comparative phylogenetic study of independent Hawaiian insect lineages and 2) investigation of population genetics of the recently formed spoon tarsus species group of Hawaiian *Drosophila*. The Natural Area Reserves are considered to be important areas for this study; many Hawaiian arthropods are host-specific, therefore one of the aims is to expand on this with genetic studies that will help to resolve some of the taxonomic and ecological issues, producing a molecular phylogeny for *Nesophrosyne* species in the *Cicadellidae* (leafhoppers) and *Nesosydne* species in the *Delphacidae* (Planthoppers); along with Diptera (Flies) in the *Limonidae*: *Dicranomyia*; *Dolichopodidae*: *Campsicnemus* and the *Eurynogaster* complex; *Calliphoridae*: *Dyscritomyia*; *Ephydriidae*: *Scatella* and, and *Drosophilidae*, especially the *cyrtoloma* species group, the *bristle tarsus* subgroup, spoon tarsus groups, *Scaptomyza*, and invasive members of the *sophophora* group, using a combination of nuclear and mitochondrial markers, as well as producing a comprehensive phylogeny for the Hawaiian *Drosophilidae*, relating evolutionary history to the geologic history of the islands and the ecological adaptations of the various

species groups.

STANDARD CONDITIONS:

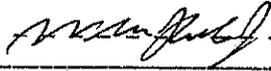
1. Besides conditions stipulated here, the permit holder will adhere to project specifications given in the permit application.
2. Disturbance of vegetation and wildlife will be avoided as much as possible. Do not leave trails. Activities may not impede public access.
3. Reports: (a) A field report will be submitted within 5 weeks of the project's completion. (b) Results of the project, as published or unpublished reports, also will be submitted. (c) The reports will identify the Natural Area Reserve as a project site and acknowledge the special-use permit approved by the NARS Commission.
4. Precautions will be taken to prevent introduction of plants or animals not naturally present in the area. Should an infestation develop, Permit Holder is responsible for eradication by methods to be specified by NARS--whether it occurs during or after the permit period, and even though it may be only indirectly attributable to the project activities.
5. This permit is not transferable.
6. This permit does not exempt the permit holder from complying with any other applicable rule or statute.
7. The State of Hawaii shall be released and held harmless from any and all liability for injuries or death, or damage or loss of property however occurring during any activity related to this permit. Provision of Chapters 183, 185, and 195, Hawai'i Revised Statutes, 1985, as amended, and any other laws applicable thereto, and all rules and regulations of the Department of Land and Natural Resources shall be strictly observed. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.
8. The Permit Holder is responsible for notifying appropriate DOFAW/NARS Staff, prior to conducting field to inform them of exact dates for each site visit, so that they are aware; this also allows time to make arrangements for gate keys or other logistical needs. This is particularly important to be sure that proposed site visits do not conflict with other NARS Staff or other permitted activities, as well as to be sure that areas are not closed due to weather or other hazards such as landslides, etc.
9. The Permit Holder is responsible for explaining permit terms to participants and ensuring their compliance at all times. A copy of this permit will accompany participants in the field at all times.
10. The proposed activities to be conducted in the Natural Area Reserves fall under the Division of Forestry and Wildlife's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource (5-2)**. Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have

no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these actions over the duration of the permit (1 year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

SPECIAL CONDITIONS:

11. This Permit authorizes the following personnel to accompany the above mentioned Permit Holder as part of this study: Kari Roesch Goodman; Postdoc fellow, Brian Ort, Postdoc fellow; Rick Lapoint, Postdoc fellow; Ph.D. Student; Gordon Bennett, Ph.D. candidate; Elizabeth (Lisa) Marrack, Ph.D. Student; and Jessica Craft, Ph.D. Student; additional assistants (including other Bishop Museum staff) may be added with prior notice; **this is the responsibility of the Permit Holder.**
12. This Permit authorizes collection from representative populations and/or species of the following families and/or genera of flies: Limoniidae (*Dicranomyia*); Dolichopodidae (*Campsicnemus* and Eurynogaster complex); Calliphoridae (*Dyscritomyia*); Ephydriidae (*Scatella*and); and Drosophilidae, especially the *cyrtoloma* species group, the bristle tarsus subgroup, spoon tarsus groups, and invasive members of the sophophora group; collections will also be made of *Nesophrosyne* species (Cicadellidae: Leafhoppers) and *Nesosydne* species (Delphacidae: Planthoppers).
13. Flies will primarily be caught live via sweeping methods (utilizing an insect net to sweep thorough foliage) or with an aspirator. Some species will be baited for using sponges soaked with fermented mushroom bait, McPhail with protein bait, and/or Multure traps with different chemical compounds. All traps will be removed from collection site at the end of the day. Care will be taken not to damage vegetation during collection. Rare and/or fragile plants such as *Cyanea* will be noted and avoided. Special care will be taken not to collect the recently listed endangered Hawaiian *Drosophila* species of Hawaiian picture wings; this particular study is focused on non-picture wing species, so close relatives of the listed species will not be collected.
14. Insects collected will be stored in 95% alcohol and either 1) pinned post-identification and removal of sample for voucher and/or DNA collection or 2) entire insect used in DNA extraction. Any insects not used in this manner will be deposited in the Bishop Museum (principal state repository); duplicate specimens may be deposited in the host or other institutions with mutual; agreement between Bishop Museum and Permit Holder.
15. Principal means of access to areas will be via 4 x 4 vehicles and hiking on foot. Should helicopter access be deemed necessary; Permit Holder is responsible for obtaining prior permission due to the fact that these areas are all part of the Conservation District, which prohibits helicopter landings without prior authorization.
16. Special considerations: Kahauale`a NAR is closed to entry; and requires separate access permission due to continuing volcanic hazard); Laupāhoehoe is now overlain by the Hawai`i Tropical Experimental Forest under the jurisdiction of the US Forest Service; a separate application needs to be made to them..
17. Permits are issued on an annual basis; if a renewal is required, please submit a report detailing progress to date (not just species lists) prior to submitting an application form detailing future plan; renewals may be delayed or denied without prior reporting. In the case of single year permits, submit a report following the permit expiration date that details what was accomplished

during the permit period.



WILLIAM J. AILA, JR., Interim Chairperson,
Board of Land and Natural Resources



PATRICK O'GRADY
Permit Holder



SCIENTIFIC PERMIT NATIVE INVERTEBRATE RESEARCH

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, RM. 325, HONOLULU, HI 96813
PH: (808)587-0019, FAX: (808)587-0160, EMAIL: cynthia.b.king@hawaii.gov

EFFECTIVE: 1 JULY 2012 – 1 JULY 2013

Endorsement No: FHM12-292

Endorsement for a Proposal to Study/Collect Native Invertebrate Animals (Exclusive of T/E Species)

Terms & acronyms used in this document: DLNR = Department of Land and Natural Resources. DOFAW = Division of Forestry and Wildlife. NARS = Natural Area Reserves System. T/E = Threatened/Endangered (specially-protected rare native organisms).

The Board of Land and Natural Resources hereby grants permission -- under the authority of: (1) Hawaii Revised Statutes (1993) Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants, specifically Paragraph 195D-4-f License; and (2) DLNR Chapter 124 Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds, specifically Paragraph 13-124-4 Scientific, Propagation, and Educational Permits -- to:

PRINCIPAL PERMIT HOLDER:

Patrick O'Grady
Assistant Professor, ESPM
University of California, Berkeley
137 Mulford Hall #3114
Berkeley, CA 94720
Phone: (510) 642-0662 Fax: (510) 643-5098
Email: ogrady@berkeley.edu

RESEARCH ASSISTANT(S):

Kari Roesch-Goodman
Gordon Bennett
Brian Ort
Elizabeth Marrack
Jessica Craft
Richard Lapoint

... to study/collect the following **NATIVE INVERTEBRATE** species in the amounts and with the methods/materials/equipment specified below. **The purpose/objectives of the study:** The proposed research takes two main approaches: (1) comparative phylogenetic study of independent Hawaiian insect lineages, and (2) investigation of the population genetics of the recently formed spoon tarsus species group of Hawaiian *Drosophila*. **Collections will be done on the islands of:** **Hawai'i** (Ka'u Forest Reserve, South Kona Forest Reserve, 'Ola'a Forest Reserve, Upper Wai'ikea Forest Reserve, Hilo Forest Reserve, Hamakua Forest Reserve, Mauna Kea Forest Reserve, Kohala Forest Reserve, Honua'ula Forest Reserve, Manuka NAR, Pu'u Maka'ala NAR, Laupahoehoe NAR, Pu'u O 'Umi NAR); **Maui** (West Maui NAR, Pu'u 'Aii'i NAR); **Oahu** (Mt. Ka'ala NAR, Pahole NAR, Ka'ena Point NAR; **Kauai** (Kuia NAR, Hono o Na Pali NAR).

Common name	Scientific name	No. of species
Various – Refer to attached list		Various – Refer to attached list

Methods/Materials/Equipment:

Sites will be accessed by 4 wheel drive vehicles and hiking. Insects will be collected via sweeping methods (utilizing an insect net to sweep through foliage) or with an aspirator. Some species will be baited using sponges soaked with fermented mushroom bait, McPhail with protein bait, and/or Multure traps with different chemical compounds. All traps will be removed from collection sites at the end of the day. The specimens will then be placed within a labeled vial filled with 95% alcohol. Care will be taken not to damage vegetation during collection. Rare and/or fragile plants such as *Cyanea* will be noted and avoided. Special care will be taken not to collect the recently listed endangered Hawaiian *Drosophila*.

The following are general conditions/understandings:

- A. This endorsement is non-transferable or assignable.
- B. Each Permit Holder is individually responsible and accountable for his or her, own actions.
- C. This endorsement does not in any way make the Board of Land and Natural Resources of the State of Hawaii liable for any claims of personal injury or property damage to the Principal Permittee or Sub-Permittee or their party which may occur while engaged in activities permitted under this endorsement; further, the Principal Permit Holder and Sub-Permit Holder agree to hold the State harmless against any claims of personal injury, death or property damage resulting from the activities of the Principal Permit Holder or Sub-Permit Holders.
- D. Principal Permit Holder shall provide, or make available for inspection, any raw data that may be obtained under this endorsement when requested by DOFAW.
- E. The endorsement shall become valid when the Principal Permit Holder has read the endorsement in-total and acknowledges understanding and agreement to abide by the conditions by signing (affixing his/her signature) in the space provided on page 4 of the document.
- F. Persons in violation of the terms and conditions of this permit and/or related or appropriate laws may be subject to criminal and or administrative penalty under Hawaii Revised Statutes §183-4, §183-5, §171-6.4 §171-31.6, Hawaii Administrative Rules §13-104-3, §13-124-8, §13-195D-9, or as otherwise provided by law. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.
- G. This endorsement may be revoked for due cause (fire danger being one, violating any of the conditions being another).
- H. Specimens will be deposited in Bishop Museum and/or the University of Hawaii at Manoa Insect Museum upon completion of project; duplicates may be deposited in host institution so all material is accounted for and may be located for any future research or other needs.
- I. The proposed activities to be conducted fall under DOFAW's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.** Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these and similar actions over the duration of the permit (1-year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

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- A. The Principal Permit Holder shall submit a report of activities for the permit period, prior to expiration of permit. The reports are due to DOFAW's main office (Attn: Entomologist) no later than one month before expiration date. The reports should indicate: When, what island, what species (best guesses are acceptable), the number of specimens collected per species, and other information required by any of the conditions of this endorsement. Copies of receipts, or other indications, for any specimen deposited at Bishop Museum and other DOFAW-authorized repositories shall be attached to the reports. The last report shall summarize/compile the accomplishments for the endorsement period. Permits are granted on a calendar year basis, even in the case of multi-year projects. If renewal is needed, submit a progress report and next year's plan in advance of expiration (at least one month) to allow time for staff evaluation and processing of renewal. **Failure to submit reports and requests in advance will result in denial of further permits in the area until resolved.**
- B. This endorsement authorizes the Principal Permit Holder and Sub-Permit Holders to study/collect the organisms listed on Page 1 ONLY and only in the amounts and manner specified.
- C. A copy of this endorsement and a photo identification card must be carried by the Principal Permit Holder and Sub-Permit Holders while engaged in activities permitted under this endorsement.
- D. **This endorsement in no way authorizes access onto property. Permission must be acquired separately.**
- E. Prior to conducting study/collecting activity on DOFAW lands, the Principal Permittee and Sub-Permittees need to have permission from the appropriate DOFAW District Offices. Write to:

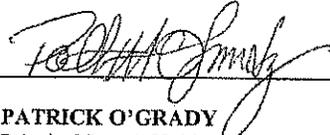
Kaua'i Branch Manager, Division of Forestry & Wildlife, 3060 Eiwa Street Rm. 306, Lihue, HI 96766. (808) 274-3433; fax (808) 274-3438.

O'ahu Branch Manager, Division of Forestry & Wildlife, 2135 Makiki Heights Drive, Honolulu, HI 96822. (808) 973-9778; fax (808) 973-9781.

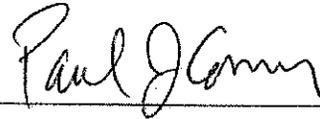
Maui (& Moloka'i) Branch Manager, Division of Forestry & Wildlife, 54 South High Street, Wailuku, HI 96793. (808) 984-8100; fax (808) 984-8111.

Hawai'i Branch Manager, Division of Forestry & Wildlife, Mailing address: PO Box 4849, Hilo, HI 96720. Street address: 19 E. Kawili St. (808) 974-4221; fax (808) 974-4226.
- F. A Special Use Permit is needed for NARS areas. Contact the NARS Commission Executive Secretary, Division of Forestry and Wildlife, 1151 Punchbowl Street Rm. 325, Honolulu, HI 96813. (808) 587-0063; fax (808) 587-0064.
- G. NOTE: For the protection of the forests and other wildland areas from pest infestations (particularly weeds and plant diseases), please clean off your shoes when moving from one island to the next.

I, **PATRICK O'GRADY**, have read the general and special conditions/understandings listed on pages 2 and 3, understand them, and hereby agree to abide by them.



PATRICK O'GRADY
Principal Permit Holder



PAUL J. CONRY, Administrator
Division of Forestry and Wildlife

**SCIENTIFIC RESEARCH AND
COLLECTING PERMIT**

Grants permission in accordance with the attached
general and special conditions



**United States Department of the Interior
National Park Service**

Hawaii Volcanoes NP

Study#: HAVO-00312

Permit#: HAVO-2012-SCI-0039

Start Date: Aug 07, 2012

Expiration Date: Sep 30, 2013

Coop Agreement#: n/a

Optional Park Code: n/a

Name of principal investigator:

Name: Patrick O'Grady **Phone:** (510) 642-0662 **Email:** ogrady@drosophilaevolution.com

Name of institution represented:

University of California, Berkeley

Co-Investigators:

Name: brian ort	Phone: n/a	Email: ort@berkeley.edu
Name: Gordon Bennett	Phone: n/a	Email: n/a
Name: Gordon Bennett	Phone: n/a	Email: n/a
Name: jessica craft	Phone: 7605203144	Email: jcraft86@berkeley.com
Name: kari roesch goodman	Phone: n/a	Email: n/a
Name: lisa marrack	Phone: n/a	Email: n/a

Project title:

A Comparative Approach to the Evolutionary Biology of Hawaiian Insects: Population Genetic and Phylogenetic Studies

Purpose of study:

Since the early 1960s Hawaiian *Drosophila* have been used as a model system to understand the mechanics of the evolutionary process. Their biogeography is remarkable; it is an example of rapid adaptive radiation on one of the most isolated island systems in the world. The seclusion of this lineage from mainland populations makes it a particular system of importance for further study and comparative analyses. Our research focuses on synthesizing and expanding on the accumulated research from decades of study on Hawaiian *Drosophila* by (1) using phylogenetic approaches to comparatively examine different lineages of endemic Hawaiian insects and (2) focusing on the genetic mechanisms of speciation at the population level.

Examining the pattern, timing, and rate of diversification in other Hawaiian insect groups (Nesophrosyne leaf hoppers and limoniid craneflies) allows us to infer common evolutionary processes. As an example, a set molecular clock can be compared to phylogenetic hypotheses of independent Hawaiian lineages to infer information about the time of colonization and rates of speciation. Biogeographic patterns can also allow us to infer how intra-island colonization and subsequent speciation events have proceeded down the island chain. A population genetics approach will also be useful in understanding how species form, particular within large, rapidly evolving lineages.

We will examine seven species of the endemic spoon tarsus clade within Hawaiian *Drosophila* for this study. At less than 500,000 years old, this group is recent compared to other clades of Hawaiian *Drosophila*. The fact that several species seemed to have formed in the past half million years, implies the speciation is either recent or ongoing in this group. By observing the evolutionary forces acting on these populations, we can gain a better understanding of the effect of gene flow, hybridization, and ancestral population size on the diversification process.

Subject/Discipline:

Invertebrates (Insects, Other)

Locations authorized:

Ola'a forest

Transportation method to research site(s):

We will access the park via motor vehicle. Collections will be made on foot.

Collection of the following specimens or materials, quantities, and any limitations on collecting:

for Scaptomyza species = 5 individuals per species

for other species (Drosophila, Nesophrosyne, Campsicnemus)= 1 individual per species

no federally listed or species of concern would be collected

Name of repository for specimens or sample materials if applicable:

Repository type: Will be destroyed through analysis or discarded after analysis

Objects collected:

for Scaptomyza species = 5 individuals per species

for other species (Drosophila, Nesophrosyne, Campsicnemus)= 1 individual per species

Specific conditions or restrictions (also see attached conditions):

1-Follow the NPS General Condition and Park specific conditions for conducting research in the Park . If applicable, a copy of USFWS endangered species permit will be provided to the park. Also the permittee agrees to keep the specific location of sensitive resources confidential. Sensitive resources include threatened species, endangered species, and rare species, archeological sites, caves, fossil sites, minerals, commercially valuable resources, and sacred ceremonial sites"

2-Only persons identified in the research permit are permitted to perform tasks associated with this permit. Names added to the permit at a later time must be given to the research coordinator before they participate in any activities.

3-contact Tracy Laqua (tracy_laqua@nps.gov) or Deb Sheppard (deb_sheppard@nps.gov) regarding disposition of your collection and dissemination of findings, (typically copies of reports/thesis are stored in park library). Note that specimen collection for personal collections are not allowed. Information given to the park may be made available to the public.

4-follow sanitation protocols to avoid bringing in nonnative weed propagules and coqui frogs into natural areas and, if applicable, argentine ants to high elevation areas .

5-Prior to going in the field, check in at the Visitor Front Desk to get current information on area closures due to environmental hazards. Contact Chief Ranger Talmadge Magno (808-985-6030) for access into areas closed to the general public.

6- Prior to entering earth cracks, conducting work on high angled slopes, and/or technical climbing, all park safety conditions must be met and a safety plan approved by Chief Ranger Talmadge Magno (808-985-6030) or his designee

7-This permit does not authorize entry into any caves or lavatubes. If applicable, follow conditions for conducting work in caves (see attached). Under no circumstances should clothing, footwear or gear that was used in a White-Nose Syndrome-affected state or region be used.

8-If applicable, follow the protocols for marking and identifying plots and equipment deployed in the field . Unidentified equipment and items in the field run the risk of being removed. Make sure that unattended equipment, plots, markers (e.g. flagging) are inconspicuous from roads and trails. The PI will provide location and description information on all equipment and identifying markers (e.g. what color flagging if any, GPS location of mist nets etc) to the Research Coordinator. All such items must be removed at the end of the study period and a notice sent to the research coordinator when all items are removed from the field.

9-If applicable, obtain an administrative use backcountry permit for all overnight stays at the Backcountry Office at the Visitor Emergency Operations Center (VEOC) tel:808-985-6178

Recommended by park staff (name and title):

[Signature]

Reviewed by Collections Manager:

Yes [checked] No

Approved by park official:

[Signature]

Date Approved:

8.7.12

Title:

Superintendent

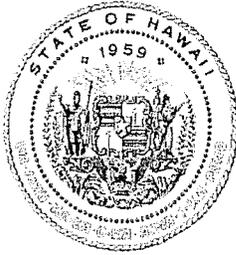
I Agree To All Conditions And Restrictions Of this Permit As Specified

(Not valid unless signed and dated by the principal investigator)

[Signature]
(Principal investigator's signature)

8/8/2012
(Date)

THIS PERMIT AND ATTACHED CONDITIONS AND RESTRICTIONS MUST BE CARRIED AT ALL TIMES WHILE CONDUCTING RESEARCH ACTIVITIES IN THE DESIGNATED PARK(S)



SPECIAL USE PERMIT

NATURAL AREA RESERVES SYSTEM

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, HONOLULU, HI 96813

EFFECTIVE: July 1, 2013 - June 30, 2014

RESERVE(S): Manuka, Pu`u Maka`ala, Kahuale`a (currently closed due to volcanic hazard; apply directly to Hawaii Island NARS staff), Laupahoehoe (apply with US Forest Service), Pu`u O`Umi, West Maui, Pu`u Ali`i, Ka`ala, Pahole, Ka`ena, Kui`a, Hono O Na Pali.

The Board of Land and Natural Resources or its authorized representative, with the approval of the Natural Area Reserves System Commission, hereby issues this Special Use Permit in accordance with Section 195-5, Hawaii Revised Statutes; and Title 13-209-5, Department Administrative Rules, to

Dr. Patrick M. O`Grady
Dept of Environmental Science,
Policy & Management
University of California-Berkeley
137 Mulford Hall #3114
Berkeley, CA 94720

Kari Roesch Goodman
Gordon Bennett
Brian Ort
Richard Lapoint
Elizabeth Marrack
Jessica Craft
Neal Evenhuis, Bishop Museum

Phone: 760-520-3144/510-642-0662
Email: ogrady@drosophilaevolution.com
Email: jcraft86@berkeley.edu

to continue to conduct surveys for, and collection of, native arthropods as part of comparative phylogenetic study of Hawaiian arthropods funded by the National Science Foundation. The research has 2 main approaches: 1) comparative phylogenetic study of independent Hawaiian insect lineages, and 2) investigation of population genetics of the recently formed spoon tarsus species group of Hawaiian *Drosophila*. The NARS are considered to be important areas for this study. Many Hawaiian arthropods are host-specific, therefore one of the aims is to expand this with genetic studies that will help to resolve some of the taxonomic and ecological issues, producing a molecular phylogeny for *Nesophrosyne* species in the Cicadellidae (leafhoppers), *Nesosydne* species in the Delphacidae (planthoppers), Diptera (flies) in the Limoniidae (*Dicranomyia*), Dolichopodidae (*Campsicnemus* and the *Eurynogaster* complex), Calliphoridae (*Dyscritomyia*), Ephydriidae (*Scatella*and), and Drosophilidae, especially the *cyrtoloma* species group, the bristle tarsus subgroup, spoon tarsus groups, *Scaptomyza*, and invasive members of the sophophora group, using a combination of nuclear and mitochondrial markers, as well as producing a comprehensive phylogeny for the Hawaiian Drosophilidae, relating evolutionary history to the geologic history of the islands and the ecological adaptations of the various species groups.

STANDARD CONDITIONS:

1. Besides conditions stipulated here, the permit holder will adhere to project specifications given in the permit application.
2. Disturbance of vegetation and wildlife will be avoided as much as possible. Do not leave trails. Activities may not impede public access.
3. Reports: (a) A field report will be submitted within 5 weeks of the project's completion. (b) Results of the project, as published or unpublished reports, also will be submitted. (c) The reports will identify the Natural Area Reserve as a project site and acknowledge the special-use permit approved by the NARS Commission.
4. Precautions will be taken to prevent introduction of plants or animals not naturally present in the area. Should an infestation develop, Permit Holder is responsible for eradication by methods to be specified by NARS--whether it occurs during or after the permit period, and even though it may be only indirectly attributable to the project activities. **Permit Holder is responsible for ensuring that all clothing and gear is cleaned before entering any Natural Area Reserve.**
5. This permit is not transferable.
6. This permit does not exempt the permit holder from complying with any other applicable rule or statute.
7. The State of Hawaii shall be released and held harmless from any and all liability for injuries or death, or damage or loss of property however occurring during any activity related to this permit. **Provision of Chapters 183, 185, and 195, Hawai'i Revised Statutes, 1985, as amended, and any other laws applicable thereto, and all rules and regulations of the Department of Land and Natural Resources shall be strictly observed. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.**
8. **The Permit Holder is responsible for notifying appropriate DOFAW/NARS Staff, prior to conducting fieldwork to inform them of exact dates for each site visit, so that they are aware; this also allows time to make arrangements for gate keys or other logistical needs.** This is particularly important to be sure that proposed site visits do not conflict with other NARS Staff or other permitted activities, as well as to be sure that areas are not closed due to weather or other hazards such as landslides, etc.
9. The Permit Holder is responsible for explaining permit terms to participants and ensuring their compliance at all times. A copy of this permit will accompany participants in the field at all times.
10. The proposed activities to be conducted in the Natural Area Reserves fall under the Division of Forestry and Wildlife's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to**

an environmental resource (5-2). Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these actions over the duration of the permit (1 year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

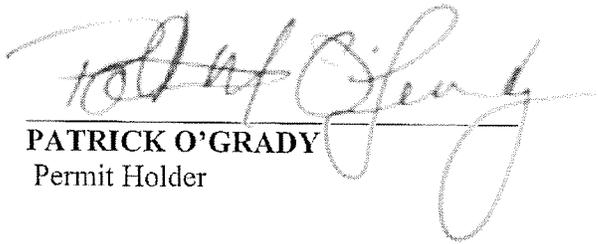
SPECIAL CONDITIONS:

11. This Permit authorizes the personnel listed above to collect insects at the locations listed above. Students and additional assistants (including Bishop Museum staff) may be added with prior notice once notified by the Permit Holder.
12. This Permit authorizes collection from representative populations and/or species of the following families and/or genera of flies: Limoniidae (*Dicranomyia*), Dolichopodidae (*Campsicnemus* and *Eurynogaster* complex), Calliphoridae (*Dyscritomyia*); Ephydriidae (*Scatella* and), and Drosophilidae, especially the *cyrtoloma* species group, the bristle tarsus subgroup, spoon tarsus groups, and invasive members of the sophophora group; collection will also be made of *Nesophrosyne* species (Cicadellidae: leafhoppers) and *Nesosydne* species (Delphacidae: planthoppers).
13. Flies will primarily be caught live via sweeping methods (utilizing an insect net to sweep through foliage) or with an aspirator. Some species will be baited by using sponges soaked with fermented mushroom bait, McPhail with protein bait, and/or Multure traps with different chemical compounds. All traps will be removed from collection site at the end of the day. Care will be taken to not damage vegetation during collection. Rare and/or fragile plants such as *Cyanea* will be noted and avoided. Special care will be taken to not collect the recently listed endangered Hawaiian *Drosophila* species of Hawaiian picture wings; this particular study is focused on non-picture wing species, so close relatives of the listed species will not be collected.
14. Insects collected will be stored in 95% alcohol and either 1) pinned post-identification and removal of sample for voucher and/or DNA collection, or 2) entire insect used in DNA extraction. Any insects not used in this manner will be deposited in the Bishop Museum (Principal State Repository); duplicate specimens may be deposited in the host or other institutions with mutual agreement between Bishop Museum and Permit Holder.
15. Principal means of access to areas will be via 4 x 4 vehicles and hiking on foot. Should helicopter access be deemed necessary, Permit Holder is responsible for obtaining prior permission due to the fact that these areas are all part of the Conservation District which prohibits helicopter landings without prior authorization.
16. Special considerations: Kahuale'a NAR is closed to entry and requires separate access permission due to continuing volcanic hazard; Laupahoehoe is now overlain by the Hawaii Experimental Tropical Forest under the jurisdiction of the US Forest Service which requires a separate permit from them.
17. Permits are issued on an annual basis. If a **renewal** is required, please submit a report detailing progress to date (not just species lists) **prior** to submitting an application form detailing future plan. Renewals may be delayed or denied without prior reporting. In the case

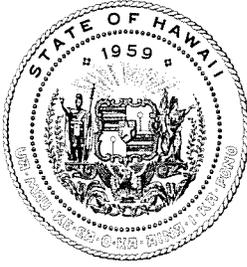
of single year permits, submit a report following the permit expiration date that details what was accomplished during the permit period.



WILLIAM J. AILA, JR., Chairperson,
Board of Land and Natural Resources



PATRICK O'GRADY
Permit Holder



SCIENTIFIC PERMIT

NATIVE INVERTEBRATE RESEARCH

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, RM. 325, HONOLULU, HI 96813
PH: (808)587-0019, FAX: (808)587-0160, EMAIL: cynthia.b.king@hawaii.gov

EFFECTIVE: 1 JULY 2013 – 1 JULY 2014

Endorsement No: FHM13-321

Endorsement for a Proposal to Study/Collect Native Invertebrate Animals (Exclusive of T/E Species)

Terms & acronyms used in this document: DLNR = Department of Land and Natural Resources. DOFAW = Division of Forestry and Wildlife. NARS = Natural Area Reserves System. T/E = Threatened/Endangered (specially-protected rare native organisms).

The Board of Land and Natural Resources hereby grants permission -- under the authority of: (1) Hawaii Revised Statutes (1993) Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants, specifically Paragraph 195D-4-f License; and (2) DLNR Chapter 124 Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds, specifically Paragraph 13-124-4 Scientific, Propagation, and Educational Permits -- to:

PRINCIPAL PERMIT HOLDER:

Patrick O'Grady
Assistant Professor, ESPM
University of California, Berkeley
137 Mulford Hall #3114
Berkeley, CA 94720
Phone: (510) 642-0662 Fax: (510) 643-5098
Email: ogrady@berkeley.edu

RESEARCH ASSISTANT(S):

Kari Roesch-Goodman
Gordon Bennett
Brian Ort
Elizabeth Marrack
Jessica Craft
Richard Lapoint

... to **study/collect** the following **NATIVE INVERTEBRATE** species in the amounts and with the methods/materials/equipment specified below. **The purpose/objectives of the study:** The proposed research takes two main approaches: (1) comparative phylogenetic study of independent Hawaiian insect lineages, and (2) investigation of the population genetics of the recently formed spoon tarsus species group of Hawaiian *Drosophila*. **Collections will be done on the islands of: Hawai'i** (Ka'ū Forest Reserve, South Kona Forest Reserve, 'Ōla'a Forest Reserve, Upper Waiākea Forest Reserve, Hilo Forest Reserve, Hamakua Forest Reserve, Mauna Kea Forest Reserve, Kohala Forest Reserve, Honua'ula Forest Reserve, Manuka NAR, Pu'u Maka'ala NAR, Laupahoehoe NAR, Pu'u O 'Umi NAR); **Maui** (West Maui NAR, Pu'u 'Ali'i NAR); **Oahu** (Mt. Ka'ala NAR, Pahole NAR, Ka'ena Point NAR); **Kauai** (Kuia NAR, Hono o Na Pali NAR).

Common name	Scientific name	No. of species
Various – Refer to attached list		Various – Refer to attached list

Methods/Materials/Equipment:

Sites will be accessed by 4 wheel drive vehicles and hiking. Insects will be collected via sweeping methods (utilizing an insect net to sweep through foliage) or with an aspirator. Some species will be baited using sponges soaked with fermented mushroom bait, McPhail with protein bait, and/or Multlure traps with different chemical compounds. All traps will be removed from collection sites at the end of the day. The specimens will then be placed within a labeled vial filled with 95% alcohol. Care will be taken not to damage vegetation during collection. Rare and/or fragile plants such as *Cyanea* will be noted and avoided. Special care will be taken not to collect the recently listed endangered Hawaiian *Drosophila*.

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- B. Each Permit Holder is individually responsible and accountable for his or her, own actions.
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- E. The endorsement shall become valid when the Principal Permit Holder has read the endorsement in-total and acknowledges understanding and agreement to abide by the conditions by signing (affixing his/her signature) in the space provided on page 4 of the document.
- F. Persons in violation of the terms and conditions of this permit and/or related or appropriate laws may be subject to criminal and or administrative penalty under Hawaii Revised Statutes §183-4, §183-5, §171-6.4 §171-31.6, Hawaii Administrative Rules §13-104-3, §13-124-8, §13-195D-9, or as otherwise provided by law. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.
- G. This endorsement may be revoked for due cause (fire danger being one, violating any of the conditions being another).
- H. Specimens will be deposited in Bishop Museum and/or the University of Hawaii at Manoa Insect Museum upon completion of project; duplicates may be deposited in host institution so all material is accounted for and may be located for any future research or other needs.
- I. The proposed activities to be conducted fall under DOFAW's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.** Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these and similar actions over the duration of the permit (1-year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

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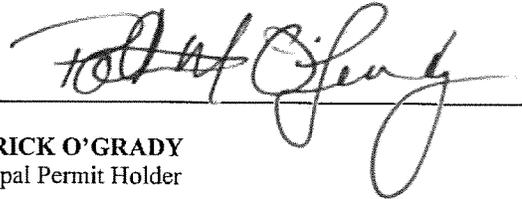
Kaua'i Branch Manager, Division of Forestry & Wildlife, 3060 Eiwa Street Rm. 306, Lihue, HI 96766. (808) 274-3433; fax (808) 274-3438.

O'ahu Branch Manager, Division of Forestry & Wildlife, 2135 Makiki Heights Drive, Honolulu, HI 96822. (808) 973-9778; fax (808) 973-9781.

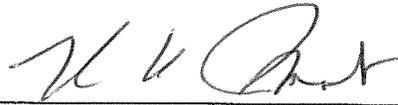
Maui (& Moloka'i) Branch Manager, Division of Forestry & Wildlife, 54 South High Street, Wailuku, HI 96793. (808) 984-8100; fax (808) 984-8111.

Hawai'i Branch Manager, Division of Forestry & Wildlife, Mailing address: PO Box 4849, Hilo, HI 96720. Street address: 19 E. Kawili St. (808) 974-4221; fax (808) 974-4226.
- F. A Special Use Permit is needed for NARS areas. Contact the NARS Commission Executive Secretary, Division of Forestry and Wildlife, 1151 Punchbowl Street Rm. 325, Honolulu, HI 96813. (808) 587-0063; fax (808) 587-0064.
- G. NOTE: For the protection of the forests and other wildland areas from pest infestations (particularly weeds and plant diseases), please clean off your shoes when moving from one island to the next.

I, **PATRICK O'GRADY**, have read the general and special conditions/understandings listed on pages 2 and 3, understand them, and hereby agree to abide by them.



PATRICK O'GRADY
Principal Permit Holder



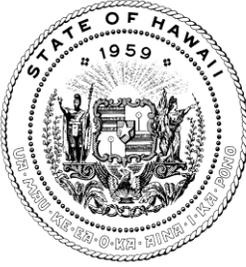
ROGER H. IMOTO, Administrator
Division of Forestry and Wildlife

<i>Species</i>	Island	Quantity (maximum per species)
<i>Drosophila adventitia</i>	Kauai	5
<i>Drosophila apoxyloma</i>	Molokai	5
<i>Drosophila arcuata</i>	Oahu	5
<i>Drosophila basimacula</i>	Kauai	5
<i>Drosophila basisetae</i>	Hawaii	5
<i>Drosophila beardsleyi</i>	Kauai	5
<i>Drosophila brevitarsus</i>	Oahu	5
<i>Drosophila bridwelli</i>	Oahu	5
<i>Drosophila canipolita</i>	Hawaii, Maui, Molokai, Oahu	5
<i>Drosophila ceratostoma</i>	Hawaii	5
<i>Drosophila clydonia</i>	Maui, Molokai	5
<i>Drosophila conformis</i>	Hawaii	30
<i>Drosophila dasyncnemia</i>	Hawaii	30
<i>Drosophila diamphidiopoda</i>	Maui, Molokai	5
<i>Drosophila eximia</i>	Maui, Molokai	5
<i>Drosophila grimshawi</i>	Maui, Molokai	5
<i>Drosophila hawaiiensis</i>	Hawaii	5
<i>Drosophila hirtitarsus</i>	Hawaii, Maui, Molokai	5
<i>Drosophila hirtitibia</i>	Maui, Molokai, Oahu	5
<i>Drosophila imitator</i>	Oahu	5
<i>Drosophila incognita</i>	Hawaii	30
<i>Drosophila larifuga</i>	Oahu	5
<i>Drosophila latigena</i>	Hawaii, Maui, Molokai	5
<i>Drosophila limitata</i>	Maui	5
<i>Drosophila mitchelli</i>	Hawaii, Molokai	5
<i>Drosophila neutralis</i>	Hawaii	30
<i>Drosophila olaae</i>	Hawaii, Maui, Molokai	5
<i>Drosophila orestes</i>	Hawaii, Maui, Molokai, Oahu, Kauai	5
<i>Drosophila percnosoma</i>	Hawaii	30
<i>Drosophila praesutilis</i>	Oahu	5
<i>Drosophila propiofacies</i>	Hawaii	5
<i>Drosophila quadrisetae</i>	Maui, Molokai, Oahu, Kauai	5
<i>Drosophila seclusa</i>	Hawaii, Maui, Molokai	5
<i>Drosophila septuosa</i>	Hawaii	30
<i>Drosophila setipalpus</i>	Maui	5
<i>Drosophila sordidapex</i>	Hawaii	30
<i>Drosophila velata</i>	Oahu	5
<i>Drosophila waddingtoni</i>	Hawaii, Maui Nui	70
<i>Drosophila xuthoptera</i>	Maui, Molokai	5

<i>Scaptomyza abberans</i>	Molokai	5
<i>Scaptomyza abrupta</i>	Maui	30
<i>Scaptomyza acronastes</i>	Oahu	15
<i>Scaptomyza adunca</i>	Oahu	15
<i>Scaptomyza affinicuspidata</i>	Maui	15
<i>Scaptomyza agrentifrons</i>	Kauai	15
<i>Scaptomyza albovittata</i>	Oahu	5
<i>Scaptomyza aloha</i>	Molokai	5
<i>Scaptomyza anechocerca</i>	Kauai	15
<i>Scaptomyza anomala</i>	Maui, Kauai	30
<i>Scaptomyza apiciguttula</i>	Hawaii	15
<i>Scaptomyza apponopusilla</i>	Hawaii	15
<i>Scaptomyza articulata</i>	Hawaii, Molokai	15
<i>Scaptomyza basiloba</i>	Hawaii	15
<i>Scaptomyza bilobata</i>	Kauai	15
<i>Scaptomyza bipars</i>	Kauai	15
<i>Scaptomyza brachycerca</i>	Hawaii	15
<i>Scaptomyza brunnimaculata</i>	Molokai	5
<i>Scaptomyza bryanti</i>	Hawaii, Maui	5
<i>Scaptomyza buccata</i>	Hawaii, Maui, Molokai, Oahu	5
<i>Scaptomyza calignosa</i>	Hawaii	30
<i>Scaptomyza camptochaites</i>	Maui	15
<i>Scaptomyza cerina</i>	Molokai	5
<i>Scaptomyza cnecosoma</i>	Oahu	5
<i>Scaptomyza concinna</i>	Maui	15
<i>Scaptomyza confusa</i>	Maui	5
<i>Scaptomyza connata</i>	Hawaii	15
<i>Scaptomyza cornuta</i>	Hawaii	15
<i>Scaptomyza crassifemur</i>	Maui, Molokai	30
<i>Scaptomyza cryptoloba</i>	Maui, Oahu	15
<i>Scaptomyza ctenophora</i>	Maui	15
<i>Scaptomyza cuspidata</i>	Hawaii, Maui	30
<i>Scaptomyza cyrtandrae</i>	Hawaii	30
<i>Scaptomyza decepta</i>	Kauai	30
<i>Scaptomyza denata</i>	Kauai	15
<i>Scaptomyza devexa</i>	Maui	15
<i>Scaptomyza diaphorocerca</i>	Molokai	15
<i>Scaptomyza domita</i>	Maui	15
<i>Scaptomyza dubautiae</i>	Maui	15
<i>Scaptomyza dubia</i>	Molokai, Kauai	15
<i>Scaptomyza eurystylata</i>	Hawaii, Maui, Oahu, Kauai	15
<i>Scaptomyza evexa</i>	Kauai	15

<i>Scaptomyza exigua</i>	Hawaii, Maui	30
<i>Scaptomyza fastigata</i>	Hawaii, Maui, Molokai	15
<i>Scaptomyza finitima</i>	Oahu	5
<i>Scaptomyza flavida</i>	Molokai	5
<i>Scaptomyza fuscifrons</i>	Oahu, Kauai	5
<i>Scaptomyza gilvivilia</i>	Maui	5
<i>Scaptomyza hackmani</i>	Hawaii, Maui, Molokai	30
<i>Scaptomyza hamata</i>	Kauai	5
<i>Scaptomyza hardyi</i>	Kauai	15
<i>Scaptomyza inaequalis</i>	Hawaii, Maui, Molokai	15
<i>Scaptomyza inermis</i>	Hawaii	15
<i>Scaptomyza infurcula</i>	Hawaii	15
<i>Scaptomyza innotabilis</i>	Kauai	15
<i>Scaptomyza intricata</i>	Maui, Molokai	30
<i>Scaptomyza isopedon</i>	Hawaii, Maui	15
<i>Scaptomyza kauaiensis</i>	Kauai	15
<i>Scaptomyza latitergum</i>	Maui	15
<i>Scaptomyza levata</i>	Hawaii, Oahu, Kauai	15
<i>Scaptomyza lobifera</i>	Hawaii	15
<i>Scaptomyza longipecten</i>	Maui, Molokai	15
<i>Scaptomyza longipecten grisenonig</i>	Maui	30
<i>Scaptomyza longisetosa</i>	Hawaii, Maui, Molokai	30
<i>Scaptomyza mauiensis</i>	Hawaii, Maui, Molokai, Oahu, Kauai	5
<i>Scaptomyza mecocerca</i>	Kauai	15
<i>Scaptomyza mediana</i>	Maui	15
<i>Scaptomyza mediopallens</i>	Hawaii	5
<i>Scaptomyza mimula</i>	Molokai	15
<i>Scaptomyza mitchelli</i>	Hawaii	5
<i>Scaptomyza monticola</i>	Hawaii	15
<i>Scaptomyza multidentata</i>	Hawaii	15
<i>Scaptomyza mutica</i>	Maui	5
<i>Scaptomyza nasalis</i>	Maui, Molokai	30
<i>Scaptomyza neocyrtandrae</i>	Hawaii	15
<i>Scaptomyza nigrosignata</i>	Hawaii	5
<i>Scaptomyza obscuricornis</i>	Maui, Molokai, Oahu	15
<i>Scaptomyza obscurifrons</i>	Molokai	15
<i>Scaptomyza ochromata</i>	Maui	15
<i>Scaptomyza ostensa</i>	Maui	15
<i>Scaptomyza pallida</i>	Hawaii, Maui, Molokai, Oahu, Kauai	30
<i>Scaptomyza pallifrons</i>	Hawaii, Maui, Molokai, Kauai	15
<i>Scaptomyza palmae</i>	Hawaii, Maui, Oahu	5
<i>Scaptomyza paralobe</i>	Hawaii	15

<i>Scaptomyza penicula</i>	Kauai	15
<i>Scaptomyza photophilia</i>	Hawaii	15
<i>Scaptomyza phrysothrix</i>	Molokai	15
<i>Scaptomyza protensa</i>	Molokai	15
<i>Scaptomyza punctivena</i>	Maui	15
<i>Scaptomyza pusilla</i>	Hawaii, Maui, Molokai	15
<i>Scaptomyza quadridentata</i>	Oahu	15
<i>Scaptomyza recava</i>	Hawaii	15
<i>Scaptomyza recta</i>	Maui	15
<i>Scaptomyza reducta</i>	Hawaii, Maui	30
<i>Scaptomyza retusa</i>	Molokai	15
<i>Scaptomyza robusta</i>	Maui	15
<i>Scaptomyza rostrata</i>	Kauai	15
<i>Scaptomyza rotundiloba</i>	Oahu	15
<i>Scaptomyza scoliops</i>	Oahu	30
<i>Scaptomyza scoloplichas</i>	Hawaii	15
<i>Scaptomyza semiflava</i>	Maui, Molokai, Oahu	30
<i>Scaptomyza setiger</i>	Hawaii	15
<i>Scaptomyza setosiloba</i>	Hawaii	15
<i>Scaptomyza silcivola</i>	Hawaii, Maui, Molokai	30
<i>Scaptomyza spilota</i>	Maui	15
<i>Scaptomyza stramineifrons</i>	Oahu	5
<i>Scaptomyza striatifrons</i>	Kauai	5
<i>Scaptomyza tenuata</i>	Hawaii	15
<i>Scaptomyza trivatata</i>	Kauai	15
<i>Scaptomyza tumidula</i>	Hawaii	15
<i>Scaptomyza uliginosa</i>	Hawaii, Maui	15
<i>Scaptomyza umrbrosa</i>	Oahu, Kauai	15
<i>Scaptomyza undulata</i>	Hawaii	30
<i>Scaptomyza univitta</i>	Kauai	15
<i>Scaptomyza vagabunda</i>	Oahu, Kauai	15
<i>Scaptomyza varia</i>	Hawaii, Maui, Molokai	15
<i>Scaptomyza varifrons</i>	Oahu	30
<i>Scaptomyza varipicta</i>	Hawaii	30
<i>Scaptomyza villosa</i>	Kauai	15
<i>Scaptomyza waialealeae</i>	Kauai	15



SCIENTIFIC PERMIT

NATIVE INVERTEBRATE RESEARCH

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, RM. 325, HONOLULU, HI 96813
PH: (808)587-0019, FAX: (808)587-0160, EMAIL: cynthia.b.king@hawaii.gov

EFFECTIVE: 24 OCTOBER 2014 – 24 OCTOBER 2015

Endorsement No: FHM15-362

Endorsement for a Proposal to Study/Collect Native Invertebrate Animals (Exclusive of T/E Species)

Terms & acronyms used in this document: DLNR = Department of Land and Natural Resources. DOFAW = Division of Forestry and Wildlife. NARS = Natural Area Reserves System. T/E = Threatened/Endangered (specially-protected rare native organisms).

The Board of Land and Natural Resources hereby grants permission -- under the authority of: (1) Hawaii Revised Statutes (1993) Chapter 195D Conservation of Aquatic Life, Wildlife, and Land Plants, specifically Paragraph 195D-4-f License; and (2) DLNR Chapter 124 Indigenous Wildlife, Endangered and Threatened Wildlife, and Introduced Wild Birds, specifically Paragraph 13-124-4 Scientific, Propagation, and Educational Permits -- to:

PRINCIPAL PERMIT HOLDER:

Patrick O'Grady
Assistant Professor, ESPM
University of California, Berkeley
137 Mulford Hall #3114
Berkeley, CA 94720
Phone: (510) 642-0662 Fax: (510) 643-5098
Email: ograde@berkeley.edu

RESEARCH ASSISTANT(S):

Kari Roesch-Goodman
Gordon Bennett
Brian Ort
Elizabeth Marrack
Jessica Craft
Richard Lapoint

... to **study/collect** the following **NATIVE INVERTEBRATE** species in the amounts and with the methods/materials/equipment specified below. **The purpose/objectives of the study:** The proposed research takes two main approaches: (1) comparative phylogenetic study of independent Hawaiian insect lineages, and (2) investigation of the population genetics of the recently formed spoon tarsus species group of Hawaiian *Drosophila*. **Collections will be done on the islands of: Hawai'i** (Ka'u Forest Reserve, South Kona Forest Reserve, 'Ola'a Forest Reserve, Upper Wai'ākea Forest Reserve, Hilo Forest Reserve, Hamakua Forest Reserve, Mauna Kea Forest Reserve, Kohala Forest Reserve, Honua'ula Forest Reserve, Manuka NAR, Pu'u Maka'ala NAR, Laupahoehoe NAR, Pu'u O 'Umi NAR); **Maui** (West Maui NAR, Pu'u 'Ali'i NAR); **Oahu** (Mt. Ka'ala NAR, Pahole NAR, Ka'ena Point NAR); **Kauai** (Kuia NAR, Hono o Na Pali NAR).

Common name	Scientific name	No. of species
Various – Refer to attached list		Various – Refer to attached list

Methods/Materials/Equipment:

Sites will be accessed by 4 wheel drive vehicles and hiking. Insects will be collected via sweeping methods (utilizing an insect net to sweep through foliage) or with an aspirator. Some species will be baited using sponges soaked with fermented mushroom bait, McPhail with protein bait, and/or Multlure traps with different chemical compounds. All traps will be removed from collection sites at the end of the day. The specimens will then be placed within a labeled vial filled with 95% alcohol. Care will be taken not to damage vegetation during collection. Rare and/or fragile plants such as *Cyanea* will be noted and avoided. Special care will be taken not to collect the recently listed endangered Hawaiian *Drosophila*.

The following are general conditions/understandings:

- A. This endorsement is non-transferable or assignable.
- B. Each Permit Holder is individually responsible and accountable for his or her, own actions.
- C. This endorsement does not in any way make the Board of Land and Natural Resources of the State of Hawaii liable for any claims of personal injury or property damage to the Principal Permittee or Sub-Permittee or their party which may occur while engaged in activities permitted under this endorsement; further, the Principal Permit Holder and Sub-Permit Holder agree to hold the State harmless against any claims of personal injury, death or property damage resulting from the activities of the Principal Permit Holder or Sub-Permit Holders.
- D. Principal Permit Holder shall provide, or make available for inspection, any raw data that may be obtained under this endorsement when requested by DOFAW.
- E. The endorsement shall become valid when the Principal Permit Holder has read the endorsement in-total and acknowledges understanding and agreement to abide by the conditions by signing (affixing his/her signature) in the space provided on page 4 of the document.
- F. Persons in violation of the terms and conditions of this permit and/or related or appropriate laws may be subject to criminal and or administrative penalty under Hawaii Revised Statutes §183-4, §183-5, §171-6.4 §171-31.6, Hawaii Administrative Rules §13-104-3, §13-124-8, §13-195D-9, or as otherwise provided by law. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.
- G. This endorsement may be revoked for due cause (fire danger being one, violating any of the conditions being another).
- H. Specimens will be deposited in Bishop Museum and/or the University of Hawaii at Manoa Insect Museum upon completion of project; duplicates may be deposited in host institution so all material is accounted for and may be located for any future research or other needs.
- I. The proposed activities to be conducted fall under DOFAW's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.** Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these and similar actions over the duration of the permit (1-year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

The following are special conditions/understandings:

- A. The Principal Permit Holder shall submit a report of activities for the permit period, prior to expiration of permit. The reports are due to DOFAW's main office (Attn: Entomologist) no later than one month before expiration date. The reports should indicate: When, what island, what species (best guesses are acceptable), the number of specimens collected per species, and other information required by any of the conditions of this endorsement. Copies of receipts, or other indications, for any specimen deposited at Bishop Museum and other DOFAW-authorized repositories shall be attached to the reports. The last report shall summarize/compile the accomplishments for the endorsement period. Permits are granted on a calendar year basis, even in the case of multi-year projects. If renewal is needed, submit a progress report and next year's plan in advance of expiration (at least one month) to allow time for staff evaluation and processing of renewal. **Failure to submit reports and requests in advance will result in denial of further permits in the area until resolved.**
- B. This endorsement authorizes the Principal Permit Holder and Sub-Permit Holders to study/collect the organisms listed on Page 1 ONLY and only in the amounts and manner specified.
- C. A copy of this endorsement and a photo identification card must be carried by the Principal Permit Holder and Sub-Permit Holders while engaged in activities permitted under this endorsement.
- D. **This endorsement in no way authorizes access onto property. Permission must be acquired separately.**
- E. Prior to conducting study/collecting activity on DOFAW lands, the Principal Permittee and Sub-Permittees need to have permission from the appropriate DOFAW District Offices. Write to:

Kaua'i Branch Manager, Division of Forestry & Wildlife, 3060 Eiwa Street Rm. 306, Lihue, HI 96766. (808) 274-3433; fax (808) 274-3438.

O'ahu Branch Manager, Division of Forestry & Wildlife, 2135 Makiki Heights Drive, Honolulu, HI 96822. (808) 973-9778; fax (808) 973-9781.

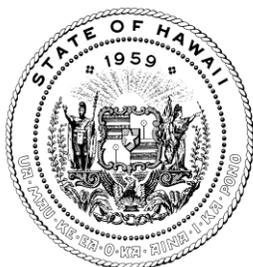
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I, **PATRICK O'GRADY**, have read the general and special conditions/understandings listed on pages 2 and 3, understand them, and hereby agree to abide by them.

PATRICK O'GRADY
Principal Permit Holder

LISA J. HADWAY, Administrator
Division of Forestry and Wildlife



SCIENTIFIC PERMIT

NATIVE INVERTEBRATE RESEARCH

DEPARTMENT OF LAND AND NATURAL RESOURCES
1151 PUNCHBOWL STREET, RM. 325, HONOLULU, HI 96813
PH: (808)587-0019, FAX: (808)587-0160, EMAIL: cynthia.b.king@hawaii.gov

EFFECTIVE: 1 JANUARY 2015 – 1 JANUARY 2016

Endorsement No: FHM15-362

Endorsement for a Proposal to Study/Collect Native Invertebrate Animals (Exclusive of T/E Species)

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PRINCIPAL PERMIT HOLDER:

Patrick O'Grady
Assistant Professor, ESPM
University of California, Berkeley
137 Mulford Hall #3114
Berkeley, CA 94720
Phone: (510) 642-0662 Fax: (510) 643-5098
Email: ogrady@berkeley.edu

RESEARCH ASSISTANT(S):

Kari Roesch-Goodman
Gordon Bennett
Nina Pak
Richard Lapoint

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Common name	Scientific name	No. of species
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The following are general conditions/understandings:

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- D. Principal Permit Holder shall provide, or make available for inspection, any raw data that may be obtained under this endorsement when requested by DOFAW.
- E. The endorsement shall become valid when the Principal Permit Holder has read the endorsement in-total and acknowledges understanding and agreement to abide by the conditions by signing (affixing his/her signature) in the space provided on page 4 of the document.
- F. Persons in violation of the terms and conditions of this permit and/or related or appropriate laws may be subject to criminal and or administrative penalty under Hawaii Revised Statutes §183-4, §183-5, §171-6.4 §171-31.6, Hawaii Administrative Rules §13-104-3, §13-124-8, §13-195D-9, or as otherwise provided by law. Infractions or misconducts will constitute grounds for revocation of this permit and criminal prosecution. Any person whose permit has been revoked shall not be eligible to apply for another permit until the expiration of two years from the date of revocation.
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- I. The proposed activities to be conducted fall under DOFAW's exemption list of June 12, 2008, including but not limited to **Exemption Class 5: Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource.** Division analysis of the proposed resource management actions concluded it will provide a positive environmental benefit and will be done in a manner to have no negative impact on the conditions that define the area. Furthermore, the cumulative impact of these and similar actions over the duration of the permit (1-year) will not have a significant adverse impact and will have minimal or no significant effect on the environment and are exempt from the need to prepare an environmental assessment.

The following are special conditions/understandings:

- A. The Principal Permit Holder shall submit a report of activities for the permit period, prior to expiration of permit. The reports are due to DOFAW's main office (Attn: Entomologist) no later than one month before expiration date. The reports should indicate: When, what island, what species (best guesses are acceptable), the number of specimens collected per species, and other information required by any of the conditions of this endorsement. Copies of receipts, or other indications, for any specimen deposited at Bishop Museum and other DOFAW-authorized repositories shall be attached to the reports. The last report shall summarize/compile the accomplishments for the endorsement period. Permits are granted on a calendar year basis, even in the case of multi-year projects. If renewal is needed, submit a progress report and next year's plan in advance of expiration (at least one month) to allow time for staff evaluation and processing of renewal. **Failure to submit reports and requests in advance will result in denial of further permits in the area until resolved.**
- B. This endorsement authorizes the Principal Permit Holder and Sub-Permit Holders to study/collect the organisms listed on Page 1 ONLY and only in the amounts and manner specified.
- C. A copy of this endorsement and a photo identification card must be carried by the Principal Permit Holder and Sub-Permit Holders while engaged in activities permitted under this endorsement.
- D. **This endorsement in no way authorizes access onto property. Permission must be acquired separately.**
- E. Prior to conducting study/collecting activity on DOFAW lands, the Principal Permittee and Sub-Permittees need to have permission from the appropriate DOFAW District Offices. Write to:

Kaua'i Branch Manager, Division of Forestry & Wildlife, 3060 Eiwa Street Rm. 306, Lihue, HI 96766. (808) 274-3433; fax (808) 274-3438.

O'ahu Branch Manager, Division of Forestry & Wildlife, 2135 Makiki Heights Drive, Honolulu, HI 96822. (808) 973-9778; fax (808) 973-9781.

Maui (& Moloka'i) Branch Manager, Division of Forestry & Wildlife, 54 South High Street, Wailuku, HI 96793. (808) 984-8100; fax (808) 984-8111.

Hawai'i Branch Manager, Division of Forestry & Wildlife, Mailing address: PO Box 4849, Hilo, HI 96720. Street address: 19 E. Kawili St. (808) 974-4221; fax (808) 974-4226.
- F. A Special Use Permit is needed for NARS areas. Contact the NARS Commission Executive Secretary, Division of Forestry and Wildlife, 1151 Punchbowl Street Rm. 325, Honolulu, HI 96813. (808) 587-0063; fax (808) 587-0064.
- G. NOTE: For the protection of the forests and other wildland areas from pest infestations (particularly weeds and plant diseases), please clean off your shoes when moving from one island to the next.

I, **PATRICK O'GRADY**, have read the general and special conditions/understandings listed on pages 2 and 3, understand them, and hereby agree to abide by them.

PATRICK O'GRADY
Principal Permit Holder

LISA J. HADWAY, Administrator
Division of Forestry and Wildlife