Guam Department of Agriculture
Division of Aquatic and Wildlife Resources

New Recovery Permit Application

Hypolimnas octocula marianensis, Mariana eight-spot butterfly

June 15, 2016

Contents

1 New Recovery Permit Application

1.1 Form 3-200-55

Department of the Interior
U.S. Fish and Wildlife Service

OMB Control No. 1018-0094
Expires 01/31/2017

Federal Fish and Wildlife Permit Application Form

click here for return addresses

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Native Endangered and Threatened Species – Scientific Purposes, Enhancement of Propagation or Survival Permits (i.e., Recovery Permits) & Interstate Commerce Permits

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual

1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix

2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)

6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution

1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)
Guam Division of Aquatic & Wildlife Resources	

2. Tax identification no.	3. Description of business, agency, tribe, or institution
	Territorial government

4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
Vice	Diane	L	

5. Principal officer title	6. Primary contact name
Wildlife Supervisor	Diane Vice

7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address
671-735-3990	671-735-0286	671-734-3154	dianevice@gmail.com

C. All applicants complete address information

1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)
163 Dairy Road

1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
Mangilao	Guam	96913		USA

2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)

2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount indicated on pages 2-3(nonrefundable processing fee).** Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: 1 No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

Signature (in blue ink) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

**** See page 15 for additional instructions on completing the above form. See page 16 for information on the Paperwork Reduction Act, Privacy Act, and Freedom of Information Act aspects of this application form.**

Section E. **ALL APPLICANTS COMPLETE SECTION E.** Provide the information outlined in Section E. on the following pages. Be as complete and descriptive as possible. Please do not send pages that are over 8.5" x 11", videotapes, or DVDs.

SCIENTIFIC PURPOSES, ENHANCEMENT OF PROPAGATION OR SURVIVAL PERMITS (i.e., RECOVERY PERMITS) & INTERSTATE COMMERCE PERMITS

What type of permit are you requesting?

- ☐ Recovery (see instructions and requirements on pp. 2-10 and 15-16 of this application form)

OR

- ☐ Interstate Commerce (see instructions and requirements on pp. 2-4, 11-12 and 15-16 of this application form)

Have you obtained all required Federal, tribal, State, county, municipal or foreign government approval to conduct the activity you propose? Please be aware that there may be other requirements necessary to conduct this activity such as an import permit, collection permit, permission to work on Federal or tribal lands, Federal bird banding permit, Corps of Engineers permits, Environmental Protection Agency NPDES permits, tribal, State, county or municipal permits, etc.

- ☐ Yes. Provide a copy of the approval(s). List the Federal agency, tribe, State, county, municipality or foreign countries involved and type of document required. Include a copy of these documents with the application.

- ☐ I have applied. List the Federal agency, tribe, State, county, municipality or foreign countries involved and type of documents required. Provide the reasons why the permits have not been issued.

  _____

- ■ Not required. The proposed activity is not regulated.

Application Processing Fees

You may update your name, address, telephone number, fax number, or e-mail address in your current application package on file at any time. These changes are considered an administrative change, and no application processing fee is required. If you wish to make an administrative change, please fill out page 1 and indicate the information that you are updating. Then check the box below, provide your permit number, and send the completed pages 1-2 to the appropriate Regional Office (see attached list).

- ☐ Administrative change for permit number: _____.

If you wish to make changes other than an administrative change, then an application processing fee is required as described below.

The application processing fee for a new Recovery or Interstate Commerce permit, or to renew/substantively amend an existing valid permit *(with major changes)* is $100. If permit amendment *(with minor changes)* is required at a time other than renewal, the processing fee is $50. For additional information on the application processing fee and the requirements to qualify for a fee exemption, please see the instructions for section D. on page 15.

If the information in your current application package on file has changed in a manner that triggers a substantive amendment or a change not otherwise specified in the permit, then you must apply for substantive amendment to your valid permit. For example, such major changes may include changes in study plan or research proposal, location, activity, amount or type of take, or species to be covered by the permit. Please contact the Regional Endangered Species Program located within the U.S. Fish and Wildlife Service (Service) Region of your proposed activity for technical assistance in making this determination (see attached list).

Check the appropriate box below and enclose check or money order payable to the *U.S. Fish and Wildlife Service* in the amount of

☐ $100 [or ☐ fee exempt (attach justification if required)] for a **new** permit. Use Option III. below to provide the required information.

OR

□ $100 [or □ fee exempt (attach justification if required)] to **renew or substantively amend** my existing valid permit (*with major changes*) using my current application package on file. Use Options II. and III. below to provide the required information. Please indicate the information that you are changing.

OR

□ $100 [or □ fee exempt (attach justification if required)] to **renew/re-issue** my existing valid permit (*without changes*) using my current application package on file. Use Option I. below to provide the requested information.

OR

□ $50 [or □ fee exempt (attach justification if required)] to **amend** my existing valid permit *(with minor changes)* at a time other than permit renewal. Use Options II. and III. below to provide the required information. Please indicate the information that you are changing.

Please check the **type of amendment** you are requesting --

□ add species (specify) _____

□ add new activity with previously permitted species (specify) _____

□ add a geographic area □ change in personnel

□ other (specify) _____

Referral of a Recovery permittee's contact information (optional)

The U.S. Fish and Wildlife Service often receives requests for lists of Recovery permittees who could conduct contract work for endangered and threatened species (e.g., presence/absence surveys). In accordance with our Privacy Act System of Records Notice (Permits System, Interior – FWS-21), we may release the name and work address or work telephone number of those who wish to be contacted by third parties to do commercial survey activities. Such information is not normally released under the Freedom of Information Act - unless a compelling need on the part of the general public can be cited.

Please be aware that this list does not represent an endorsement by us of any particular permittee. This referral is provided at the discretion of each U.S. Fish and Wildlife Service Regional Office as time and workload allow.

Please indicate below your preference for the release of your information to third parties.

■ Yes, I authorize the U.S. Fish and Wildlife Service to release my name, work address and/or work telephone number to third parties as a referral for contract work for endangered and threatened species.

□ No, I do not authorize the U.S. Fish and Wildlife Service to release my name and work address and/or work telephone number to third parties.

Application Processing

To expedite a final decision on your application, you are urged to coordinate with us as soon as possible for guidance in assembling a complete application package, and to send us your complete permit application package at least three months prior to the start of your proposed activities. If you are renewing or amending a valid permit, your complete application package must be received at least 30 days prior to the expiration of the valid permit. These time periods begin with our acceptance of a complete permit application package and do not include any time required for requesting clarification or additional information about your application, or the length of time between our request and your response.

The information provided in your permit application will be used to evaluate your application for compliance with the Endangered Species Act, its implementing regulations (which may require a 30 day public comment period), and with U.S. Fish and Wildlife Service policy. Receipt and possession of a permit under the Endangered Species Act should be regarded as a privilege, as we must balance permit issuance with our duties to protect and recover listed species.

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal, re-issuance or amendment.

If your activities may affect species under the authority of the National Marine Fisheries Service (NMFS/NOAA Fisheries), then you may need to obtain a separate permit from that agency. In addition we share jurisdiction with NMFS/NOAA Fisheries for sea turtles (e.g., we evaluate applications for permits to conduct activities impacting sea turtles on land, and NMFS/NOAA Fisheries evaluates applications for permits to conduct activities impacting sea turtles in the marine environment). To apply for a permit to conduct activities with sea turtles in the marine environment or other species under NMFS/NOAA Fisheries jurisdiction, please contact them via their permit web page at http://www.nmfs.noaa.gov/pr/permits/

****

If you are not applying as an individual but as a business, corporation, tribe, institution, or non-Federal public agency (block B. on page 1 of the application), the person to whom the permit will be issued (e.g., the landowner, president, director, executive director, or executive officer) is legally responsible for implementing the permit. Although other people under the direct control of the permittee (e.g., employees, contractors, consultants) receive third party take authorization in their capacity as designees of the permittee, the individual named as the permittee ultimately is legally responsible for the permit and any activities carried out under the permit except as otherwise limited in the case of permits issued to State or local government entities under 50 CFR 13.25(e).

****

RECOVERY PERMIT APPLICATION INSTRUCTIONS

(see pp. 11-12 for Interstate Commerce permit application instructions)

You have 3 options for providing the required information for a Recovery permit application.

Recovery Permit Application: Option I. Renew/Re-issue of an Existing Valid Recovery Permit (*Without Changes*) Using My Current Application Package On File.

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal or re-issue.

Sign the following statement if you are applying to renew or re-issue an existing valid Recovery permit without changes. If you are proposing changes to your Recovery permit, you must use Options II. and III. below.

The individual signing box D. on page 1 of the application must also sign (in blue ink) the following statement. This certification language is required under 50 CFR 13.22(a).

> I certify that the statements and information submitted in support of my original application for a U.S. Fish and Wildlife Service Recovery permit # _____ are still current and correct and hereby request (please check either ☐ renewal or ☐ re-issuance) of that permit without changes.
>
> _____ _____
> signature (in blue ink) date
>
> _____
> please print name legibly
>
> * Please note: If you have signed the above statement, then your renewal/re-issue request is complete. Please submit completed pages 1- 5 of this application to our Regional Office (see attached list) covering the location of your proposed activity. Requests for renewals/re-issuance must complete and accepted by the Service no later than 30 days prior to permit expiration to ensure that your current permit remains in effect while we process your request.

Recovery Permit Application: Option II. Renewal or Amendment of an Existing Valid Recovery Permit (*With Changes*)

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal or amendment.

Sign the following statement if you are proposing to renew or amend an existing valid Recovery permit, including making major changes. Such major changes may include changes in a study plan or research proposal, location, activity, amount or type of take, or species to be covered by the permit.

The individual signing box D. on page 1 of the application must also sign (in blue ink) the following statement. This certification language is required under 50 CFR 13.22(a).

> I certify that the statements and information submitted in support of my original application for a U.S. Fish and Wildlife Service Recovery permit # _____ are still current and correct, except for the changes listed in Option III. below, and hereby request (please check either ☐ renewal or ☐ amendment) of that permit.
>
> _____ _____
> signature (in blue ink) date
>
> _____
> please print name legibly

Provide a brief description of the changes to your valid permit (answer the appropriate questions for these changes requested under Recovery Permit Application Option III. below). Please submit this page and completed pages 1-3 of this application form (along with the changed information relative to Option III. below) to our Regional Office (see attached list) covering the location of your proposed activity.

_____

Recovery Permit Application: Option III. New Recovery Permit & Supplementary Information for Renewal or Amendment of an Existing Valid Permit (*With Changes*)

General permit regulations for the U.S. Fish and Wildlife Service can be found at 50 CFR 13. Regulations for Recovery and Interstate Commerce permits under the Endangered Species Act can be found at 50 CFR 17.22(a)(1) for endangered wildlife species, 50 CFR 17.32(a)(1) for threatened wildlife species, 50 CFR 17.62 for endangered plant species, and 50 CFR 17.72 for threatened plant species.

Applications for a Recovery permit must provide the following specific information (relevant to the activity) in addition to the general information on pages 1-4 of this application. Please attach separate pages. In order to assist us in processing your request, please provide the item number (A.1.a., etc.) of the required information before each of your responses. Thank you.

A. Identify species and activity:

1. For a new Recovery permit:

   a. Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)).

   b. Provide the number, age, and sex of such species to the extent known.

   c. Identify the activity sought to be authorized (i.e., presence/absence survey, nest monitoring, bird banding, etc.) for each species.

2. For an amended Recovery permit:

   a. Identify the activities and/or species to be added to your valid permit (provide both the scientific, to the most specific taxonomic level, and common names) as well as the species' status (see 1.a. above).

   b. Provide the number, age, and sex of such species to the extent known.

   c. If any activities requested in this application differ from those authorized in your valid permit, then for each species state the currently authorized activity, the requested new activity, and how the new activity will impact each species.

   d. Identify the activity sought to be authorized (i.e., presence/absence survey, nest monitoring, banding, etc.) for each species.

   e. Quantify any anticipated effects to the habitat of each added species.

   f. Identify activities and/or species to be deleted from your valid permit and the reason(s) for the deletion.

3. If you are applying for a permit for the collection of plants from the wild:

   a. Describe what plant part(s), and the number(s) or other type(s) of indication of material you plan to collect (i.e., whole plant, leaves, pollen, seeds, etc.).

   b. If the proposed activity involves the collection of seeds taken from the wild, provide information that evaluates the effects of the seed collection on the reproductive potential of the species at the collection location.

B. Identify location of the proposed activity:

1. Provide the name of the State, county, tribal land, and the specific location of the proposed activity site(s). Include a formal legal description, section/township/range information, county tax parcel number, local address, or any other identifying property designation that will precisely place the location of the proposed activity site(s).

2. If the specific study area is known at the time of application, attach a U.S. Geological Survey map of the study area in 7.5 minute quadrangle (1:24,000) scale, or other appropriately scaled map. If you plan to conduct surveys on a

contract basis in the future, these maps can be provided once the specific area is known (the counties in which you will work must be provided at this time).

3. If your request is for aquatic species, identify the aquatic system (river/lake/stream name, river mile information, and drainage basin).

C. Describe the proposed activity:

1. Provide a statement justifying the permit request, including the following: *[A copy of a research or study proposal that provides this information can be attached in lieu of the information requested below.]* Use additional sheets as necessary.

   a. Describe in detail the purpose(s) and objective(s) of the project.

      i. Include study design, sampling methodologies and equipment to be used.

      ii. Identify any null hypothesis or other anticipated results from the project that will support the reasoning why the project is justified for enhancement of propagation or survival of the affected species.

      iii. Include planned disposition of specimens upon completion of project.

   b. Describe how the proposal will help recover each species.

      i. If there is an approved recovery plan, identify the recovery tasks by number and name, if applicable. Include any additional recovery tasks identified in a Spotlight Species Action Plan, or in a 5-year status review of the species.

      ii. Identify, or provide copies of any previous or similar research conducted on this species.

      iii. If this information exists, explain how the project will answer questions not answered by earlier research.

      iv. Explain how you will coordinate your efforts with past and ongoing research studies.

   c. Can this project result in the injury, death, or removal from the wild of any individuals of the species?

      i. If yes, describe all that apply (i.e., injury, death, removal from the wild).

      ii. For each species, please state the maximum number of individuals that would be injured, killed, or removed from the wild: *[If applicable, please identify, based on a reasonable expectation, the number of individuals likely to be injured or killed per activity.]*

      iii. Please state what will be done to minimize the possibility of injury to or death of individuals.

      iv. If the proposed activity would cause the death of individuals from the wild or remove individuals from the wild, describe your attempts to obtain the wildlife or plant specimens currently held in captivity/nurseries/museums, or produced in captivity. You must demonstrate conclusively that existing specimens are unavailable or your study objectives require new/additional specimens. *[Provide the identity and phone number of each contact made in this regard.]*

   d. Identify contracts and agreements held for the proposed activities (attach copy or give title, funding organization name and address, date of signature, duration of contract).

      i. State whether full funding will be available for the completion of the proposed activity. *[If you do not hold a contract at this time, but foresee receiving one, you may apply for a permit contingent upon receiving the contract(s).]*

   e. If live wildlife or plants to be covered by the permit are to be held in captivity:

[Note: Under our regulations at 50 CFR 17.22(a)(3) and 17.32(a)(3), escape of wildlife held in captivity must be reported immediately to our appropriate Regional Office (see attached list)].

i. Give a complete description, attaching photographs and/or diagrams, of the area and facilities where wildlife or plant(s) will be held and/or maintained in captivity and describe arrangements for care during transportation and maintenance. Include the name and address of the area and facilities. *[A separate discussion specific for each species must be provided, if applicable.]*

ii. Provide the full names of person(s) who will care for live specimens, including a resume of their experience in raising, caring for, and propagating similar wildlife or plants.

iii. Provide any contract or agreement you have secured for care of any live specimens collected under this permit request if the identified facility is not affiliated with you. Attach a copy or give title, funding organization name and address, date of signature, and duration of contract. *[A joint application may be appropriate in situations where one entity will collect the specimens and another entity will conduct the propagation/maintenance activities.]*

iv. List mortalities resulting from your activities with these or similar species in the last 2 years.

v. Provide an explanation of each mortality event and the procedures employed or modified to eliminate any future mortality events.

vi. Indicate your willingness to participate in a cooperative breeding or propagation program or to contribute data to a database or studbook. Holding wildlife and plants in captivity must comply with our Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act. This policy can be found on the U.S. Fish and Wildlife Service's Endangered Species web page at http://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html. Briefly describe how the proposed activity will comply with this policy.

vii. State the planned disposition of the collected and/or propagated species after termination of the project/activity.

D. Identify the persons who will conduct the proposed activity:

1. Provide the full name of all individuals, *including first name, middle initial, and last name*, who you propose will work under this permit.

   a. If more than one activity is included in the permit application, indicate which activity(ies) will be completed by each individual.

   b. For each listed individual, please also provide a copy of each person's resume and/or curriculum vitae, plus specific information on previous professional training and experience working with the species affected by the permit request. Information must include: the approximate number of hours of focused activity with each species in occupied habitat; approximate number of each species the applicant has worked with at each site (e.g., how many pair of birds at a specific site); names, dates, and location of areas surveyed; and experience with similar species. Please provide the names and phone numbers of at least two references who can verify experience with the species (reference letters are always appreciated).

E. Identify the location of the affected species, to the extent known:

1. For each species indicate whether, at the time of the application, the organism was:

   a. Still in the wild;

   b. Had been removed from the wild (provide State, county, and specific location of removal); and

   c. Was born in captivity or artificially propagated (provide State, county, specific location, and name of the institution where born or propagated).

2. If you are applying for a permit for the collection of plants from the wild, list the lands from which you plan to collect the plants.

   a. If these lands are under Federal jurisdiction, identify the Federal land management agency(ies) that have jurisdiction for the lands. Include the name, title (District Ranger, Field Supervisor, etc.), address, and telephone number of the person in charge of the Federal lands.

1.2 Details

A. **Identify species and activity:**

1. **For a new Recovery permit:**

a. **Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)).**

Hypolimnas octocula marianensis
Mariana eight-spot butterfly
Endangered

2. **Provide the number, age, and sex of each species to the extent known.**

Not known

3. **Identify the activity sought to be authorized (i.e., presence/absence survey, nest monitoring, bird banding, etc.) for each species.**

Collection of 30 eggs and/or larvae to establish a captive population

4. **Identify location of the proposed activity:**

All activity will be performed on the island of Guam. Eggs and/or caterpillars will be collected from limestone cliff areas in northern Guam and captive rearing will be done at the the University of Guam Agricultural Experiment Station in Yigo, Guam.

5. **Describe the proposed activity:**

Proposed activity is described in the attached proposal entitled "Establishment of Captive and Managed Populations of the Mariana Eight-spot Butterfly, *Hypolimnas octocula marianensis*". The objective of this proposal is to partially implement an action plan for *H. octocula* published in Guam's Comprehensive Wildlife Conservation Strategies. The proposal was accepted and funded by USFWS and two University of Guam biologists, Dr. Aubrey Moore and Dr. Curt Fiedler, began work on the project. Unfortunately, the project was put on hold pending issuance of a recovery permit following listing of *H. octocula* in late 2015.

6. **Identify the persons conducting the proposed activity:**

The proposed activity will be performed by two University of Guam biologists. Both have worked with the eight-spot butterfly for several years.

Dr. Aubrey Moore (CV avalable in section 3.1)
Dr. Curt Fiedler (CV avalable in section 3.2)

7. **Identify the location of affected species, to the extent known:**

The eight-spot butterfly is still in the wild in limited areas on Guam. The exact distribution areas are not well studied. However, it seems that the host plants are limited to areas where ungulate activities are reduced – i.e., hard to reach deep karst areas near cliff areas.

2 Previously Approved Conservation Project

2.1 Original Proposal

STATE WILDLIFE GRANT PROGRAM

CFDA: 15.634

FON12AS00102

T-12-R-1 Project:

Establishment of Captive and Managed Populations of the Mariana Eight-Spot Butterfly, *Hypolimnas octocula marianensis*

FISCAL YEAR 2014

July 26, 2013 (FINAL)

Division of Aquatic and Wildlife Resources
Department of Agriculture
Government of Guam
(671) 735-3955 (PH)
(671) 734-6570 (FAX)

GUAM STATE WILDLIFE GRANT PROGRAM: T-12-R-1
Grant Period: October 1, 2013-September 30, 2014

PROJECT TITLE: Establishment of Captive & Managed Populations of the Mariana Eight-Spot Butterfly (*Hypolimnas octocula marianensis*)

INTRODUCTION

Projects funded by the State Wildlife Grant Program (SWGP) are administered within the Wildlife Section of the Guam Agriculture's Division of Aquatic and Wildlife Resources. Guam's Comprehensive Wildlife Conservation Strategy (GCWCS) is the guiding document for projects funded under SWGP. The cost for T-12 FY2014 project is $23,212.00.

NEED

The Mariana eight-spot butterfly, *Hypolimnas octocula marianensis*, also known as the forest flicker, is a candidate for listing under the US Federal Endangered Species Act (1973). This rare butterfly subspecies is currently found only in Guam's limestone forest habitat where its larval host plants *Procris pedunculata* and *Elatostema calcareum* occur.

The GCWCS goal, objectives and action plan for conserving this subspecies are:

- **Goal:** To establish a viable population of *H. o. marianensis* in Guam
- **Objectives:** To survey on Guam habitats containing *Procris* spp.. To study seasonal population dynamics of *H. o. marianensis* in the laboratory, culture *H. o. marianensis* in the laboratory, survey natural enemies, study the biology of the butterfly, and release laboratory reared butterfly in the *Procris* habitats
- **Action Plan**: Habitat degradation and loss: Identify and map occurrences of *Procris pedunculata*. Reduce impacts of ungulates and invasive plants in limestone forests areas where *Procris* occurs. Small or extirpated population: Conduct monthly surveys at the Hilaan Point to observe seasonal activity for this butterfly species, and cultivate caterpillars of this species and rear them to adult stage in a parasite and predation free enclosure for propagation. Release reared in the lab adults in limestone habitats where the host plant is abundant and especially in conservation areas of Guam.

Larval host plants of the butterfly are heavily browsed by ungulates and many areas where they exist are being cleared for military buildup and associated development projects. Although there have been several recent surveys *H. o. marianensis* and its host plants, no work has been done towards establishing captive and managed populations of *H. o. marianensis* and its host plants.

The project will investigate the feasibility of rearing and breeding *H. o. marianensis* on host plants in cages and also in field sites where ungulates are excluded. The establishment of captive breeding colonies and managed populations of this rare butterfly will reduce risk of extinction. However, in order to maintain or increase the habitat available for the recovery of the eight-spot butterfly the public must be engaged to

preserve and/or establish habitat on private lands. Awareness materials that encourage the preservation of limestone habitat and establishment of butterfly gardens will assist in enlisting the support of the public to preserve and protect Guam's species of greatest conservation need.

OBJECTIVES

1. Propagate and maintain at least 100 plants of each of the eight-spot's known host plants, *Procris pendunculata* and *Elatostema calcareum* in a plant nursery.
2. Establish a self-sustaining, caged, breeding colony of eight-spot butterflies using 30 field-collected caterpillars reared on plants from the nursery.
3. Propagate host plants throughout two 10 x 10 meter, wooded limestone areas at the University of Guam's Agricultural Experiment Station in Yigo.
4. Release 60 cage-reared eight-spot butterflies and larvae on protected host plants.
5. Produce 2000 posters and fact sheets on eight-spot butterflies to encourage the establishment of butterfly gardens (i.e., habitat) on private and public lands.

BENEFITS

This project will create and protect fragile habitat of a SGCN. The development of captive propagation and release techniques for the Mariana eight-spot butterfly can be used for future projects to reestablish the butterfly in other places on Guam. Future projects could include butterfly gardens in private and public lands. Butterflies are important for pollination of host plant species. The public awareness materials produced within this project will assist with the development of future areas where butterflies can be established. Awareness of Guam's SGCN helps produce a public that expects conservation actions from their government and supports policies to preserve and protect Guam's natural resources.

APPROACH

1. Guam Department of Agriculture will sub-grant **$21,212.00** to the University of Guam (UOG) via a Memorandum of Understanding between the Guam Department of Agriculture and the UOG to complete objectives related to the propagation of eight-spot butterflies and their host plants for the establishment of the captive and managed populations.
2. **Propagate and maintain at least 100 plants of each of the eight-spot's known host plants, *Procris pendunculata* and *Elatostema calcareum* in a plant nursery.** Host plants will be collected in the wild and propagated from cuttings. A nursery containing at least 100 plants of each species will be established and maintained to supply food for caged insects and starts for out-planting in ungulate-free areas. Botanists Lauren Gutierrez and John Benedict have established successful protocols for propagating host plant species.
3. **Establish a self-sustaining, caged, breeding colony of eight-spot butterflies using 30 field-collected caterpillars reared on plants from the nursery.** Ten *H. o. marianensis* caterpillars will be placed in each of 3 screen cages (BugDorm;

6620 Insect Rearing Cage; 60x60x120cm) containing *Procris pendunculata* plants from the nursery. Founding members of the colony will be field collected as caterpillars. At each field collection site, we will collect no more than 25% of the caterpillars available on each site visit date. Upon generation of F1 offspring, we will expand the colony to 6 cages. Generation time, food consumption, host plant preference and fecundity will be recorded.

4. **Propagate host plants throughout two 10 x 10 meter, wooded limestone areas at the University of Guam's Agricultural Experiment Station in Yigo.** Permission for this work to be completed within the fenced property of the University of Guam's Agricultural Experiment Station in Yigo has already been granted. Host plants from the nursery will be out-planted into two 10 m by 10 m plots within forested limestone at UOG Yigo Experiment Station. Out-plantings will be monitored to ensure growth and establishment.
5. **Release 60 cage-reared eight-spot butterflies and larvae on protected host plants.** After establishment of host plants at the experiment station, we will release individuals from the breeding colony. In one plot, we will release 30 marked, sexed butterflies. In the other plot, we will release 30 late instar caterpillars. During weekly visits we will count all life stages of *H. o. marianensis* populations in both plots and look for signs of predation, parasitism and competition for host plants.
6. **Produce 2000 posters and fact sheets on eight-spot butterflies to encourage the establishment of butterfly gardens (i.e., habitat) on private and public lands.** Guam Division of Aquatic & Wildlife will design a poster and develop an instruction sheet for preserving and creating butterfly habitat. Posters will be distributed to target audiences.

PERSONNEL

Principal Investigator: Aubrey Moore, University of Guam

Project Leader: Diane Vice

Technical Assistance: (UOG)

GEOGRAPHIC LOCATION

Yigo, Guam

Figure 1: Map indicting location of propagation cages for eight-spot butterfly

TIMELINES

Project Leader Administration Activities:

December 2013	Administration - establish accounts
January to February 2014	Develop MOU with UOG
February 2014	Develop collateral materials for dissemination
March 2014	Submit quotes and requisitions for purchase orders.
October 2014	Prepare reports

Eight-spot Propagation Activities	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Propagate the eight-spot's host plants, *Procris pendunculata* and *Elatostema calcareum* in a nursery.												
Establish a self-sustaining, caged, breeding colony of eight-spot butterflies.												
Propagate host plants in limestone area protected from ungulates.												
Release cage-reared eight-spot butterflies on the protected host plants.												
Perform weekly field counts and observations												

BUDGET

DAWR Poster Production	**$ 2,000.00**
UOG Sub-grant (see below for details)	**$ 21,212.00**
Total	**$ 23,212.00**

UOG Sub-grant Details

ITEM	
Personnel	
Student technicians (UOG); $10 per hour; 1100 hours	$11,000.00
Social security at 7.65%	$841.50
Total Personnel	**$11,841.50**
Supplies	
Vehicle maintenance and fuel	$1,000.00
Gardening tools, pots, soil, etc.	$500.00
Insect rearing cages (BugDorm 6620 * 8)	$1,100.00
Laboratory and office supplies	$500.00
Total Supplies	**$3,100.00**
UOG Indirect Costs (57% of hourly wages)	**$6,270.00**
TOTAL	**$21,211.50**

2.2 Grant Award for F13AF01300, Ammendment 2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
911 NE 11th Avenue
Portland, Oregon 97232-4181

In Reply Refer to:
FWS/R1/WSFR

August 28, 2015

Acting Director, Matthew Sablan
Department of Agriculture
163 Dairy Road
Mangilao, Guam 96913

DUNS: 855023235

Subject: Notice of Amendment to Grant Award for **F13AF01300, Amendment #2**

Dear Mr. Sablan:

Your organization's application for Federal financial assistance amendment titled ***"Mariana Eight-Spot Butterfly Project"*** submitted to the U.S. Fish and Wildlife Service (Service)'s CFDA Program 15.634 is approved effective July 14, 2015 This award is amended as follows: **time extension.**

The performance period of this award is ***October 1, 2013*** through ***September 30, 2016***. Only allowable costs resulting from obligations incurred during the performance period and any authorized pre-award costs may be charged to this award. All obligations incurred under the award must be liquidated no later than 90 calendar days after the end of the performance period, unless the Service approves a final financial reporting period extension (see Reporting Requirements section below). If you need more time to complete project activities, you must submit a written request to the Service at r1fa_grants@fws.gov before the end of the stated performance period.

Payments:

Your organization has completed enrollment in U.S. Treasury's Automated Standard Application for Payment (ASAP) system. When requesting payment in ASAP, your Payment Requestor will be required to enter an Account ID. The number assigned to this award is the partial Account ID in ASAP. When entering the Account ID in ASAP, the Payment Requestor should enter the award number identified in the subject line on letter followed by a percent sign (%). Refer to the ASAP.gov Help menu for detailed instructions on requesting payments in ASAP.

Terms of Acceptance:

Acceptance of a financial assistance award (i.e., grant or cooperative agreement) from the Service carries with it the responsibility to be aware of and comply with the terms and conditions

applicable to the award. Acceptance is defined as the start of work, drawing down funds, or accepting the award via electronic means. Awards are based on the application submitted to and approved by the Service. Awards are subject to the terms and conditions incorporated into the notice of award either by direct citation or by reference to the following: Federal regulations; program legislation or regulation; and special award terms and conditions. The Federal regulations applicable to Service recipients and their subrecipients and contractors are listed by recipient type in the **Service Financial Assistance Award Terms and Conditions** posted on the Internet at http://www.fws.gov/grants/. If you do not have access to the Internet and require a full text copy of the award terms and conditions, contact our office.

Special Conditions and Provisions:

All conditions and provisions from the original grant award letter and any amendments remain in effect.

As of this amendment, this grant is subject to 2 CFR 200 "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards".

Reporting Requirements:

Report Title	Report Period:	Due Date
Interim Federal Financial Report (SF-425)	September 30, 2015	December 29, 2015
Interim Performance Report	September 30, 2015	December 29, 2015
Final Federal Financial Report (SF-425)	September 30, 2016	December 29, 2016
Final Performance Report	September 30, 2016	December 29, 2016

All Reports should be sent to r1fa_grants@fws.gov.

Recipients must use the Standard Form (SF) 425, *Federal Financial Report* form for all financial reporting. This form is available at http://www.whitehouse.gov/omb/grants_forms.

Performance reports must contain: 1) a comparison of actual accomplishments with the goals and objectives of the award as detailed in the approved scope of work; 2) a description of reasons why established goals were not met, if appropriate; and 3) any other pertinent information relevant to the project results. ***A technical report of the completed project should be provided with the basic final performance report at the end of the grant.*** Please include the Service award number provided in the subject line of this letter on all reports.

Financial and performance reporting due dates may be extended by the Service upon receipt of a written request addressed to the Service at r1fa_grants@fws.gov identifying the type of report to be extended, the requested revised due date, and a justification for the extension. The Service may approve an additional extension if justified by a catastrophe that significantly impairs the recipient's operations. Requests for reporting due date extensions must be received by the Service no later than one day before the original reporting due date.

Significant Developments Reports (see 2 CFR 200.328(d)):

Events may occur between the scheduled performance reporting dates that have significant impact upon the supported activity. In such cases, notify the Service Project Officer in writing as soon as the following types of conditions become known:

- Problems, delays, or adverse conditions that will materially impair the ability to meet the objective of the Federal award. This disclosure must include a statement of any corrective action(s) taken or contemplated, and any assistance needed to resolve the situation.

Favorable developments that enable meeting time schedules and objectives sooner or at less cost than anticipated or producing more or different beneficial results than originally planned.

Conflict of Interest Disclosures:

Recipients are responsible for notifying the Service Project Officer in writing of any actual or potential conflicts of interest that may arise during the life of this award. Conflicts of interest include any relationship or matter which might place the Recipient, the Recipient's employees, or the Recipient's subrecipients in a position of conflict, real or apparent, between their responsibilities under this award and any other outside interests. Conflicts of interest may also include, but are not limited to, direct or indirect financial interests, close personal relationships, positions of trust in outside organizations, consideration of future employment arrangements with a different organization, or decision-making affecting the award that would cause a reasonable person with knowledge of the relevant facts to question the impartiality of the Recipient, the Recipient's employees, or the Recipient's subrecipients in the matter. Upon receipt of such a notice, the Service Project Officer in consultation with their Ethics Counselor will determine if a conflict of interest exists and, if so, if there are any possible actions to be taken by the Recipient, the Recipient's employee(s), or the Recipient's subrecipient(s) that could reduce or resolve the conflict. Failure to resolve conflicts of interest in a manner that satisfies the Service may result in any of the remedies described in 2 CFR 200.338, Remedies for Noncompliance, including termination of this award.

Other Mandatory Disclosures:

Recipients and their subrecipients must disclose, in a timely manner, in writing to the Service or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting this award. Failure to make required disclosures can result in any of the remedies described in 2 CFR 200.338, Remedies for noncompliance, including suspension or debarment (See 2 CFR 200.113, 2 CFR Part 180, and 31 U.S.C. 3321).

Indirect Costs:

Indirect costs under this award are approved on the condition that the Recipient will submit an indirect cost rate proposal to their cognizant agency immediately after the award is made and no later than 90 calendar days past the award performance period start date. The Recipient is not authorized to charge indirect costs under this award until the Recipient has received, and provided a copy to our office at r1fa_grants@fws.gov, an approved Negotiated Indirect Cost Rate Agreement (NICRA) from the Federal government. In the event the Recipient fails to

establish an approved rate before the end of the award performance period, the Service may either: 1) deobligate the Federal amount budgeted for indirect costs and, if not otherwise prohibited by legislation or regulation, allow the Recipient to use costs otherwise allocable as indirect costs to satisfy cost-sharing or matching requirements; or 2) allow the Recipient to transfer the amount otherwise allocable as indirect costs to direct costs. Service approval of such budget changes will depend on the particular award circumstance. Indirect costs otherwise allocable to this award may not be shifted to another Federal award unless specifically authorized by legislation. The Recipient must comply with the approved NICRA Agreement.

System for Award Management (SAM) Registration:

Under the terms and conditions of this award, your organization must maintain an active SAM registration at https://www.sam.gov/portal/public/SAM/ until the final financial report is submitted or final payment is received, whichever is later. If your organization's SAM registration expires during the required period, the Service will suspend payment under this and all other Service awards to your organization until you update your organization's SAM registration.

Project Contacts:

Service Project Officer for this award is:	Recipient Project Officer for this award is:
Ruth C.B. Utzurrum, Ph.D. (808) 792-9571 ruth_utzurrum@fws.gov	Celestino Aguon (671) 7635-3955 tinoaguon@gmail.com

Please contact Ruth C.B. Utzurrum with any questions. Please include the Service award number provided in the subject line of this letter in all written communications.

Thank you for your interest and efforts in supporting conservation of fish and wildlife and their habitats.

Sincerely,

Paul Hayduk, Acting Chief
Wildlife and Sport Fish Restoration Program

Enclosure

OMB Number: 4040-0004
Expiration Date: 8/31/2016

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [ ] Application
- [x] Changed/Corrected Application

* 2. Type of Application:
- [ ] New
- [ ] Continuation
- [x] Revision

* If Revision, select appropriate letter(s): C: Increase Duration

* Other (Specify):

* 3. Date Received: ~~10/01/2013~~ 7/14/2015

4. Applicant Identifier: Guam State Wildlife Grant T-12

5a. Federal Entity Identifier: USFWS

5b. Federal Award Identifier: F13AF01300 Amd2

State Use Only:

6. Date Received by State: 10/01/2013

7. State Application Identifier: Guam State Wildlife Grant-T-12

8. APPLICANT INFORMATION:

* a. Legal Name: Guam Department of Agriculture, Div Aquatic and Wildlife Res

* b. Employer/Taxpayer Identification Number (EIN/TIN): 98-0018947

* c. Organizational DUNS: 8550232350000

d. Address:

* Street1: 163 Dairy Road

Street2:

* City: Mangilao

County/Parish:

* State: GU: Guam

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: Zip 96913

e. Organizational Unit:

Department Name: Agriculture

Division Name: Aquatic & Wildlife Res.

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.

* First Name: Celestino

Middle Name: Flores

* Last Name: Aguon

Suffix:

Title: Chief of DAWR

Organizational Affiliation: Government of Guam

* Telephone Number: 671-735-3955/6

Fax Number: 671-734-6570

* Email: tinoaguon@gmail.com

Application for Federal Assistance SF-424

* 8. Type of Applicant 1: Select Applicant Type:

A: State Government

Type of Applicant 2: Select Applicant Type:

F: U.S. Territory or Possession

Type of Applicant 3: Select Applicant Type:

* Other (specify):

* 10. Name of Federal Agency:

U.S. Fish and Willdlife Service

11. Catalog of Federal Domestic Assistance Number:

15.634

CFDA Title:

State Wildlife Grant-T-10

* 12. Funding Opportunity Number:

N/A

* Title:

T-12-R-1 Project Amendment #2 Establishment of Captive and Managed Populations of the Mariana Eight-Spot Butterfly,Hypolimnas octocula marianensis

13. Competition Identification Number:

N/A

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

* 15. Descriptive Title of Applicant's Project:

This a no-cost extension for Guam Sea Turtle nesting monitoring for FY16

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: Guam
* b. Program/Project: T12R1

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 10/01/2013
* b. End Date: 09/30/2016

18. Estimated Funding ($):

* a. Federal	0.00
* b. Applicant	0.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	0.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☒ a. This application was made available to the State under the Executive Order 12372 Process for review on 09/30/2013.

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	Mr.
* First Name:	Matthew
Middle Name:	L.G.
* Last Name:	Sablan
Suffix:	
* Title:	Acting Director
* Telephone Number:	Acting Director
Fax Number:	671-734-6570
* Email:	matt.sablan12@yahoo.com
* Signature of Authorized Representative:	for MLGS
* Date Signed:	09/14/2014

Department of Agriculture
Dipåttamenton Agrikottura

163 Dairy Road, Mangilao, Guam 96913

Director's Office	300-7965/7966; Fax 734-6569
Agricultural Dev. Services	300-7973/7972; Fax 734-8096
Animal Health	300-7965
Aquatic & Wildlife Resources	735-3955/56; Fax 734-6570
Forestry & Soil Resources	300-7976; Fax 734-0111
Plant Nursery	300-7974
Plant Inspection Facility	472-1426; 475-1427; Fax 477-9487

Edward J.B. Calvo
Governor

Raymond S. Tenorio
Lt. Governor

Matthew L.G. Sablan
Acting Director

Jessie B. Palican
Deputy Director

July 13, 2015

Dr. Ruth Utzurrum
Pacific Islands Federal Coordination Specialist
U.S. Fish & Wildlife Service
300 Ala Moana Blvd., Federal Aid Room 5-207
P.O. Box 50167
Honolulu, HI 96850

Re: F13AF01300 Amendment #2 (T-12-R-1) – Establishment of Captive and Managed Populations of the Mariana Eight-Spot Butterfly

Dear Dr. Utzurrum:

Hafa Adai! Please find attached documentation to amend F13AF01300. We are requesting an extension until September 30, 2016 to complete the project in FY 2016. The initial administration of grant documents, account establishment were completed in year one; and, year two has resulted in contracting the propagation of host plants for out-planting in the protected areas. Next step in FY 2016 is to complete the butterfly rearing/propagation and release.

Thank you for your continued cooperation. Should you have any questions, please contact Ms. Diane Vice, at dianevice@gmail.com, or via phone, at (671) 735-3955/56.

Sincerely,

MATTHEW L.G. SABLAN
Acting

Attachment(s):

STATE WILDLIFE GRANT PROGRAM

CFDA: 15.634

F13AF01300

T-12-R-1 Project Amendment #2

Establishment of Captive and Managed Populations of the Mariana Eight-Spot Butterfly, *Hypolimnas octocula marianensis*

FISCAL YEAR 2016

June 2, 2015

Division of Aquatic and Wildlife Resources
Department of Agriculture
Government of Guam
(671) 735-3955/56
(671) 734-6570 (FAX)

GUAM STATE WILDLIFE GRANT: F13AF01300 (T-12)
Grant Period: October 1, 2011 - September 30, 2016

PROJECT TITLE: Establishment of Captive & Managed Populations of the Mariana Eight-Spot Butterfly (*Hypolimnas octocula marianensis*)

INTRODUCTION/NEED (Revised)
The cost for F13AF01300 (T-12) project remains at $23,212.00. No additional funds are necessary; however, an extension of time through FY 2016 is necessary to complete project objectives.

PROJECT STATUS UPDATE (Revised)
In FY 2014 the Memorandum of Understanding between the University of Guam and the Division of Aquatic and Wildlife Resources was completed. Supplies and equipment were purchased in preparation for implementation. In FY 2015, as of May, a botanist has successfully propagated the butterfly's host plants, *Procris pedunculata* and *Elatostema calcareum* for planting in two forested plots within the fenced ungulate free area, as well as within the cages for captive propagation. In FY 2015 an on-line field guide to butterflies was created using the information and pictures contained in the book, "Butterflies of Micronesia", by Ilse Schreiner and Don Nafus, former University of Guam entomologists and available for download from http://guaminsects.myspecies.info/butterflies-micronesia. The intent is to make the guide available through iNaturalist (http://iNaturalist.org) so that it can be used on smart phones and tablets. Stickers with the eight-spot butterfly will be designed and distributed for increased awareness and identification of butterfly. Historical and current sightings of eight-spot butterflies are being documented. The project started slowly due to administrative processes, however the project is now ready to move forward with the management portion of the project.

OBJECTIVES (#5 Revised)

1. Propagate and maintain at least 100 plants of each of the eight-spot host plants, *Procris pendunculata* and *Elatostema calcareum* in a plant nursery.

2. Establish a self-sustaining, caged, breeding colony of eight-spot butterflies using 30 field-collected caterpillars reared on plants from the nursery.

3. Propagate host plants throughout two 10 x 10 meter, wooded limestone areas at the University of Guam's Agricultural Experiment Station in Yigo.

4. Release 60 cage-reared eight-spot butterflies and larvae on protected host plants.

5. Produce eight-spot butterfly collateral materials (i.e, stickers, magnets, trading cards) to encourage the reporting and recovery of eight-spot butterfly. If appropriate after testing planting of host plants, land owners will be encouraged to plant butterfly gardens on private and public lands.

APPROACH

1. **Guam Department of Agriculture will sub-grant $21,212.00 to the University of Guam** (UOG) via a Memorandum of Understanding between the Guam Department of Agriculture and the UOG to complete objectives related to the propagation of eight-spot butterflies and their host plants for the establishment of the captive and managed populations.

2. **UOG will propagate and maintain at least 100 plants of each of the eight-spot's known host plants, *Procris pendunculata* and *Elatostema calcareum* in a plant nursery.** Host plants will be collected in the wild and propagated from cuttings. A nursery containing at least 100 plants of each species will be established and maintained to supply food for caged insects and starts for out-planting in ungulate-free areas. Botanist Lauren Gutierrez has established successful protocols for propagating host plant species.

3. **UOG will establish a self-sustaining, caged, breeding colony of eight-spot butterflies using 30 field-collected caterpillars reared on plants from the nursery.** Ten *H. o. marianensis* caterpillars will be placed in each of 3 screen cages (BugDorm; 6620 Insect Rearing Cage; 60x60x120cm) containing *Procris pendunculata* plants from the nursery. Founding members of the colony will be field collected as caterpillars. At each field collection site, we will collect no more than 25% of the caterpillars available on each site visit date. Upon generation of F1 offspring, we will expand the colony to 6 cages. Generation time, food consumption, host plant preference and fecundity will be recorded.

4. **UOG will establish host plants throughout two 10 x 10 meter, wooded limestone areas at the University of Guam's Agricultural Experiment Station in Yigo.** Permission for this work to be completed within the fenced property of the University of Guam's Agricultural Experiment Station in Yigo has already been granted. Host plants from the nursery will be out-planted into two 10 m by 10 m plots within forested limestone at UOG Yigo Experiment Station. Out-plantings will be monitored to ensure growth and establishment.

5. **UOG will release 60 cage-reared eight-spot butterflies and larvae on protected host plants.** After establishment of host plants at the experiment station, individuals will be released from the breeding colony. In one plot, 30 marked, sexed butterflies will be released. In the other plot, 30 late instar caterpillars will be released. All life stages of *H. o. marianensis* populations will be monitored in both plots and signs of predation, parasitism and competition for host plants will be documented.

6. **GDAWR will produce eight-spot butterfly collateral materials** (i.e, stickers, magnets, trading cards) to encourage the reporting and recovery of eight-spot butterfly. If appropriate after testing the planting of host plants in non-karst areas, landowners will be encouraged to plant butterfly gardens on private and public

lands. Collateral materials will focus on habitat protection for the butterflies – limestone forest – and creating new habitat.

TIMELINE (Revised)

December 2013	Administration established accounts
January - February 2014	Developed MOU with UOG
June 2014	MOU signed by Governor
August 2014	Contracted propagation of host plants
December 2014 – July 2015	On-line field guide development
June 2015	Host plants delivery to UOG
June-August 2015	Students hired to collect butterfly larvae, plant host plants
June – December 2015	Captive propagation of butterflies
June – December 2015	Release larvae & monitor
May – December 2015	Develop collateral materials for dissemination

3 Resumes

3.1 Aubrey Moore

PO Box 5345, UOG Station
Mangilao, Guam, U.S.A. 96923

TEL: 671-686-5664
aubreymoore@guam.net

Aubrey Moore

Education

1988	Ph.D., Entomology, University of Hawaii, Honolulu, Hawaii
1984	M.S., Entomology, Michigan State University, East Lansing, Michigan
1979	B.Sc., Integrated Science Studies, Carleton University, Ottawa, Ontario

Professional Experience

2008-Pres.	Extension Entomologist, Cooperative Extension Service, University of Guam, Guam
2003-2008	Research Associate, College of Natural & Applied Sciences, University of Guam, Guam
1999-2003	Pesticide Evaluator, Pest Management Regulatory Agency, Health Canada, Ottawa, ON
1998-1999	Entomologist, School of Agriculture & Life Sciences, Northern Marianas College, Saipan
1992-1997	Research Director, School of Agriculture & Life Sciences, Northern Marianas College, Saipan
1991-1992	Entomologist, Northern Mariana Islands Department of Natural Resources, Saipan
1990-1991	Entomologist, USDA Agricultural Development in the American Pacific Project, Guam & Maui
1989-1990	Research Associate, University of Hawaii Agricultural Experiment Station, Maui, Hawaii
1988	Post-doctoral Fellow, Hawaiian Evolutionary Biology Program, Honolulu, Hawaii
1985–1988	Graduate Assistant, Department of Entomology, University of Hawaii, Honolulu, Hawaii

1985-1986	Programmer/consultant, University of Hawaii Computing Centre, Honolulu, Hawaii
1984	Research Associate, Department of Entomology, Michigan State University, East Lansing, MI
1984	Entomologist, Insect and Rodent Control Section, Michigan Dept. of Public Health, Lansing, MI
1981-1984	Graduate Assistant, Department of Entomology, Michigan State University, East Lansing, MI
1979-1981	Research Tech., Forest Pest Management Institute, Environment Canada, Sault Ste. Marie, ON
1975-1979	Research Technician, Chemical Control Research Institute, Environment Canada, Ottawa, ON

Professional Memberships

Entomologial Society of America
Hawaian Entomological Society
Florida Entomological Societry
Pacific Science Association
Sigma Xi Research Fraternity

Publications

Book Chapters

[1] Moore, A. & J. A. Tenorio 2006. Our Islands' Insects and Their Relatives. In *Island Ecology and Resource Management*. Editor: J. Furey; Publisher: Northern Marianas College Press.

[2] Schreiner, I., L. Yudin, A. Moore & D. Nafus 1998. Management of Insects and Mites. In *Guam Cucurbit Guide*. Editors: L. Yudin & R. Schlub; Publisher: College of Agriculture & Life Sciences, University of Guam.

[3] Hunter, W. B., D. E. Ullman & A. Moore 1994. Electronic Monitoring: Characterizing the Feeding Behavior of Western Flower Thrips (Thysanoptera: Thripidae). in *History, Development, and Application of AC Electronic Insect Feeding Monitors*. Editors: M. M. Ellsbury, E. A. Backus & D. L. Ullman; Publisher: Entomological Society of America.

Refereed Journal Articles

[1] Moore, A., T. Jackson, R. Quitugua and P. Bassler 2015. Coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae), grubs develop in live coconut palm crowns on Guam. Florida Entomologist, 98(3):1012-1014.

[2] Moore, Aubrey, Gillian Watson, and Jesse Bamba 2014. First record of eggplant mealybug, *Coccidohystrix insolita* (Hemiptera: Pseudococcidae), on Guam: Potentially a major pest. Biodiversity Data Journal 2. DOI: 10.3897/BDJ.1.e1042. URL: http://biodiversitydatajournal.com/articles.php?id=1042.

[3] Fisher, Nicole, Aubrey Moore, Bradley Brown, Matthew Purcell, Gary Taylor, and John Salle 2014. Two new species of *Selitrichodes* (Hymenoptera: Eulophidae: Tetrastichinae) inducing galls on Casuarina (Casuarinaceae). Zootaxa 3790.4, 534–542. ISSN: 1175-5334. URL: http://biotaxa.org/Zootaxa/article/view/ zootaxa.3790.4.2/7933.

[4] Marler, T.E, A. Moore, and R. Miller 2013. Vertical stratification in predation of armored scale on *Cycas micronesica* seedlings. HortScience 48(1) 60-62.

[5] Marler, TE, Wiecko G, Moore A. 2012. Application of game theory to the interface between militarization and environmental stewardship in the Mariana Islands. Commun Integr Biol. 5:193-195 .URL: http://dx.doi.org/10.4161/cib.18889

[6] Marler, T. E., L. S. Yudin and A. Moore 2011. *Schedorhinotermes longirostris* (Isoptera: Rhinotermitidae) invades Guam: yet another assault on the endemic *Cycas micronesica*. Florida Entomologist 94: 699-700.

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Scientific Meeting Presentations

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[2] Moore, Aubrey 2014. Biological invasion of forests on Guam and other islands of Micronesia. 65th Western Forest Insect Work Conference. Oral presentation. Sacramento, California.

[3] Moore, Aubrey 2014. Evaluation of a Scratchpad template as an online database for the University of Guam insect collection. iDigBio Biodiversity Collections Digitization in the Pacific Workshop. Oral presentation. Honolulu, Hawaii.

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[10] Moore, A. 2012. CRB is the BTS of the 21st Century. Brown Treesnake Technical Working Group Meeting. Conference Paper (oral presentation)

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[18] Miller, RH, Moore A, Reddy GVP. 2011. The invasion of Pacific islands: some thought on invasive species, insular ecosystems, and human impact in the western Pacific. Entomological Society of America Pacific Branch Annual Meeting. Conference Paper (oral presentation)

[19] Moore, A. 2011. An update on the Guam coconut rhinoceros beetle eradication project. Western Micronesia Invasive Species Committee Annual Meeting. Conference Paper (oral presentation)

[20] Moore, A. 2011. Containing the rhinoceros beetle outbreak on Guam. International Plant Protection Congress. Conference Paper (oral presentation)

[21] Mersha, Z, Schlub RL, Spaine P, Smith J, Nelson S, Moore A, McConnell J, Pinyopusarerk K, Nandwani D, Badilles A. 2010. Pre and post January 2009 Guam ironwood, *Casuarina equisetifolia*, tree decline conference. Conference Paper (oral presentation)

[22] Moore, A. 2010. Update on the Guam Coconut Rhinoceros Beetle Eradication Project. Entomological Society of America Annual Meeting. Conference Paper (oral presentation)

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[25] Kirsch, P, Moore A, Kirsch C, Oluput G. 2009. Q-TRAP: In-transit detection of bioinvasive insects in intermodal shipping containers. 6th International Integrated Pest Management Symposium. Conference Paper (poster presentation)

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[29] Moore, A., C. Apperson, J. McLaughlin, P. Kirsch & D. Czokajlo. Automated classification of morphologically identical mosquito sibling species using wingbeat harmonics. Poster presentation at the Annual Meeting of the Entomological Society of America, San Diego, December, 2007.

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[32] Moore A. Invasive Insects on Guam. Guest speaker; TSTAR Economics of Invasive Species Workshop. Guam, February, 2006.

[33] Moore A. FAST-ID: Instrumentation for Automated Classification of Flying Insects Using Optically-Sensed Wingbeat Waveforms. Western Pacific Tropical Research Center Conference, August, 2006.

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[35] Moore, A. Development of an optical flying insect detection and identification system (OFIDIS).[poster] International Conference on Integrated Pest Management, Toronto 2002.

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[48] Moore, A. Fruit flies in the Marianas: Past, Present, & Future. III Regional Conference on Agricultural Development in Micronesia. Saipan, 1993.

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[56] Yudin, L. S., B. E. Tabashnik, W. C. Mitchell, & A. Moore. Predicting tomato spotted wilt incidence in lettuce. International Conference on Tomato Spotted Wilt, Honolulu, 1989.

[57] Moore, A. & B.E. Tabashnik. Monitoring insect landing activity using a digital balance interfaced with a microcomputer. Entomological Society of America, National Meeting, Boston, MA, 1987.

[58] Moore, A. Auto-amputation in diamondback moths: a new form of insecticide resistance? Tester Symposium, Honolulu, HI, 1987.

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[60] Moore, A. Automated identification of flying insects by analysis of wingbeat harmonics. Entomological Society of America, Pacific Branch Meeting, Honolulu, HI, 1985. (Awarded second prize in student paper competition)

[61] Moore, A. & S. H. Gage. Fitting curves to phenology data using an optimization technique. Entomological Society of America, National Meeting, Detroit, MI., 1983.

[62] Moore, A. & S. H. Gage. The Cooperative Crop Monitoring System as a Potential Source of Data for Pest Phenology Models. Entomological Society of America, North Central Branch Meeting, St. Louis, MO., 1983.

3.2 George Curt Fiedler

CURRICULUM VITAE

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Date of Birth: 27 November, 1963 **Nationality:** USA

Relevant Experience

- Three years of *tree snail* research on Guam, including surveys and population estimates
- One year of rare butterfly survey experience
- Field team leader for 2013 DoD survey project for rare butterflies and tree snails on DoD lands
- Ten years experience on various biology survey projects in Hawaii
- Seasoned field biologist and photographer
- Extensive entomology and invertebrate zoology collection & identification experience

Positions:

Editor, Micronesica, University of Guam, Mangilao, Guam, January 2014 to present.

Field Research Team Leader, NAVFAC/UOG Federal Candidate Species Surveys on Guam (N40192-12-2-8001), Spring -Winter 2013.

Associate Professor in Biology, *UOG Marine Lab Research Associate*, University of Guam, Mangilao, Guam, Fall 2012 to present.

Associate Professor in Natural Sciences, University of Maryland University College, Asia Division, Tokyo, Japan, Fall 2003 to Summer 2012.

Instructor, University of Puget Sound, Pacific Rim/Asia Study-Travel Program, (Marine Biology & Oceanography), Okinawa, Japan Session, Fall 2002.

Graduate Teaching Assistant, University of Hawai`i at Manoa. (Zoology, Biology, and Entomology Departments), 1988-1990 & 1992-2000.

Research Consultant, US Fish & Wildlife Service, Honolulu, Hawai`i 1996-1997.

Instructor, Kansai Gai Dai Hawai`i College. Chemistry Lecturer (6th term), Spring 1994.

Research Assistant, Hawai`i Institute of Marine Biology. Research consists of assessment of Kaneohe Bay fisheries stocks for a portion of the MHI/MRI program, 1990-1992.

Field Technician, Hawai`i Cooperative Fisheries Research Unit. Research includes biological surveys of stream and estuary habitats for environmental assessment, Spring/Summer 1990.

Education/Training:

Postdoctoral Research Fellow, Japan Society for the Promotion of Science, Tropical Biosphere Research Center, University of the Ryukyus, Okinawa, Japan, Spring 2001 – Spring 2003. [Dr. Kazuhiko Sakai]

PhD Zoology, Zoology Department, University of Hawai`i at Manoa. Dissertation title: Reproductive Biology and Sex Determination of Two Caridean Shrimp Genera: *Hymenocera and Lysmata*, December, 2000. [Drs. Ernst Reese, Christopher Brown, S. Randy Haley]

M.S. Zoology, University of Hawai`i at Manoa, Zoology Department. Thesis Title: Larval Stages of the Harlequin Shrimp, *Hymenocera picta*. May, 1994. [Drs. Ernst Reese, George Losey, Julie Bailey-Brock].

B.S. in Biology (Honors) with a minor in Psychology from the Case Institute of Technology, Case Western Reserve University, August, 1986.

Awards & Honors:

- *McIntire-Stennis Forestry Research Grant* (Native Tree Snails) 2014-2018
- *Research Associate,* University of Guam Marine Laboratory, Fall 2012 to present.
- *Visiting Researcher*, Tokyo Metropolitan University, October 2003 - 2012.
- Nominated in 2006 & 2007 for *Outstanding Faculty Award* at UMUC Asia
- *JSPS Research Fund*, JSPS Fellow Research Support Grant (2001, 2002)
- *Edmondson Scholarship Grant-in-aid*, University of Hawai`i, 1996.
- *Edmondson Award*, University of Hawai`i, 1993.
- *Honorable Mention*, Graduate Student Organization Symposium, University of Hawai`i, 1993.

Relevant Publications:

Fiedler, G.C., Pillman, S.K., & Kerr, A.M. (*In Prep)*. Update on the status and distribution of partulid tree snails (Partulidae: Stylommatophora) on Guam, Mariana Islands.

Kerr, A.M. and Fiedler, G.C. (*In Prep)*. Partulid tree snails (Partulidae: Stylommatophora) of the Mariana Islands, Micronesia

Kerr, A.M. and Fiedler, G.C. (2015). Sinistral coiling in the arboreal snail *Partula gibba* Férussac, 1821 (Stylommatophora: Partulidae) from Guam, Mariana Islands. American Malacological Bulletin, *In Press*.

Onaga, H., Fiedler, G.C., Baeza, A. (2012). Protandric simultaneous hermaphroditism in *Parhippolyte misticia* (Clark, 1989) (Caridea: Hippolytidae): Implications for the evolution of mixed sexual systems in shrimp. Journal of Crustacean Biology, *32(3)*: 383-394.

Fiedler, G.C., Rhyne, A., Segawa R., Aotsuka, T., and Schizas, N. (2010). The evolution of euhermaphroditism in caridean shrimps: a molecular perspective of sexual systems and systematics, BMC Evolutionary Biology, *10*: 297.

Okuno, J. and Fiedler, G.C. (2010). *Lysmata lipkei*, a new species of peppermint shrimp (Decapoda, Hippolytidae) from the warm temperate and subtropical waters of Japan In: C. H. J. M. Fransen, S. De Grave and P. K. L. Ng (eds.), Studies on Malacostraca: Lipke Bijdeley Holthuis Memorial Volume, Crustaceana Monograph, *14*: 597-610.

Hermansen, T.D., Arvedlund, M., & Fiedler, G.C. (2005). Calcium antagonists inhibit the discharge of cnidae in response to electrical stimulation in the giant tropical sea anemone *Heteractis crispa* Ehrenberger (Anthozoa), Marine and Freshwater Behaviour and Physiology, *38*: 269-274.

Fiedler, G.C. (2002). The Influence of social environment on Sex Determination in Harlequin Shrimp (*Hymenocera picta*: Decapoda, Gnathophyllidae), Journal of Crustacean Biology, *22*: 750-761.

Karplus, I., Fiedler, G.C., and Ramcharan, P. (1998). The intraspecific fighting behaviour of the Hawai`ian boxer crab, *Lybia edmondsoni* - Fighting with Dangerous Weapons?, Symbiosis, *24*: 287-302.

Fiedler, G.C. (1998). Functional, simultaneous hermaphroditism in female-phase *Lysmata amboinensis*, Pacific Science, *52*: 161-169.

Kalaria, R.N., Fiedler, C. and Hunsaker, J.C. (1993). Synaptic Neurochemistry of Human Striatum During Development: Changes in Sudden Infant Death, Journal of Neurochemistry *60*: 2098-2102.

Arora, P.K., Riachi, N.J., Fiedler, G.C., Malvinder, M.P. Abdallah, F., Harik, S.I. & Sayre, L.M. (1990). Structure-neurotoxicity trends of analogues of 1-Methyl-4-Phenylpyridinium (MPP+), the cytotoxic metabolite of the dopaminergic neurotoxin MPTP, Life Sciences *46*:379-390.

Presentations, Posters, Abstracts:

Fiedler, G.C., Rhyne, A., and Schizas, N. (2009). Mitochondrial and nuclear ribosomal phylogeny of the genus *Lysmata* Risso and other selected hippolytid shrimp genera: the evolution of unique sexual patterns in the Hippolytidae, Presentation for the 2009 Crustacean Society Summer Meeting, Tokyo, Japan.

Schizas, N., Rhyne, A., and Fiedler, G.C. (2007). Multigene phylogeny of the caridean shrimp genus *Lysmata*, Presentation for the 2007 Benthic Ecology Meeting, Atlanta, Georgia.

Schizas, N., Rhyne, A., and Fiedler, G.C. (2007). Multidata phylogeny of the Western Atlantic *Lysmata*. Presentation for the 2007 SICB Meeting, Phoenix, Arizona.

Fiedler, G.C. (2005). The Evolution of Simultaneous Hermaphroditism in the Hippolytidae, Presentation for the 2005 Japan Carcinological Society meeting, Nara, Japan.

Onaga, H. and Fiedler, G.C. (2004). Protandric Simultaneous Hermaphroditism in *Parhippolyte mistica* (Clark, 1989), Poster for the 2004 Japan Carcinological Society meeting, Tokyo, Japan.

Fiedler, G.C. and Shinjo, K. (2003). Protandric Hermaphroditism in the Semi-terrestrial Shrimp, *Merguia oligodon* (De Man, 1888), Presentation for the 2003 Japan Carcinological Society meeting, Okinawa, Japan.

Fiedler, G.C. (2001). Sperm transfer in a simultaneous hermaphrodite shrimp, *Lysmata amboinensis*, Presentation for the 2001 Japan Carcinological Society meeting, Tokyo, Japan.

Fiedler, G.C. (2001). Hermaphrodites & parasites: A sordid tale of shrimp sex and isopod manipulation, Presentation for the Fifth International Crustacean Congress, Melbourne, Australia.

Fiedler, G.C. (1996). Simultaneous, functional hermaphroditism in Hawai`ian *Lysmata amboinensis*, Presentation for the 21st Annual Albert L. Tester Memorial Symposium, Department of Zoology, University of Hawai`i.

Fiedler, G.C. (1995). Simultaneous, functional hermaphroditism in Hawai`ian *Lysmata amboinensis*, Presentation for the XXIV International Ethological Conference, Honolulu, Hawai`i.

Fiedler, G.C. (1993). Early life history and sex determination in the harlequin shrimp, *Hymenocera picta*, American Zoologist 33:104, Presentation and abstract for 1993 Annual meeting of ASZ.

Fiedler, G.C., Aeby, G.S., and Clarke, T.A. (1992). Use of small midwater objects to monitor pelagic juvenile stages of tropical carangid fishes, Presentation for the 77th Annual Ecological Society of America Meeting, Honolulu, Hawai`i.

Fiedler, G.C. (1992). Pair bond development in *Hymenocera picta*, Presentation for the 17th Annual Albert L. Tester Memorial Symposium, Department of Zoology, University of Hawai`i.

Fiedler, G.C. (1989). Observations on the social behavior of a small population of the butterflyfish *Chaetodon ornatissimus* in Kaneohe Bay, Hawai`i, Presentation for the 14th Annual Albert L. Tester Memorial Symposium, Department of Zoology, University of Hawai`i.

Specialized Skills:

- SCUBA Certification, Advanced Open Water.
- Small boat operation & piloting skills.
- Experience in Windows & Macintosh computer platforms, & various data analysis packages.
- Spanish, French, and Japanese language experience.

Community Service:

- •Nature Guide and Consultant, Japanese School of Guam, Mangilao, Guam, 2013-present.
- •Fish Bowl Quiz Show Moderator, Guam, 2013 - 2015.
- •Guam Island Wide Science Fair Judge, 2013.
- •Volunteer for Hosen Kindergarten special events, Sagamihara, Japan, 2010-2012.
- •Organizer of weekly amateur ultimate frisbee game, Futakotamagawa, Japan, 2004-2005.
- •Volunteer guide for community tours of the Hawai`i Institute of Marine Biology, 1992-1999.
- •Volunteer judge and tournament organizer for youth card games, Honolulu, Hawai`i, 1997-1998.
- •Volunteer editor for newsletter of community computer users group, Honolulu, Hawai`i, 1990-1992.

Professional References:

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