# University of Guam

College of Natural & Applied Sciences

Cooperative Extension & Outreach

## Reflective Form

### Comprehensive Faculty Evaluation System – Part I

**Your name:** Aubrey Moore

**Your current Rank and Step:** Extension Entomologist / Associate Professor

**This CFES evaluation period:** June 15, 2015 – June 14, 2016

| Role Assignments | Percent of Time |
|---|---|
| Extension & Outreach | 51% (primary focus must be a minimum of 50%) |
| Creative/Research/Scholarly | 34% |
| Instruction | 0% |
| University Service | 15% |
| TOTAL | 100% |

**Please list any outside consulting activities for this performance period:**
None.

The components of: (1) Planned Activities, (2) Evidence of Accomplishment, and (3) Evaluated By for each of the Roles identified above are found in Part II.

As called for by the University Comprehensive Faculty Evaluation System, I hereby acknowledge that I have notified my unit Chair and unit colleagues of my preferences for role assignments.

Further, I have met with my appropriate administrative supervisor and discussed my evaluation plan for the period above cited. I understand that amendments to my plan are possible and that said amendments, if any, are to be discussed with and agreed upon by my administrator prior to initiating.

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Signature of Faculty Date:

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Signature of Associate Dean Date:

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Signature of Dean/Director Date:

## Comprehensive Faculty Evaluation System – Part II

Directions: This document serves as a Plan of Work for the upcoming period and then as the Annual Report, a year later, relative to your accomplishments in the Plan of Work. Please note any deviations from your original plan – activities that changed and the ones that got added for some reason – in the second table. DO NOT ALTER THE ORIGINAL TOP TABLE. For any papers, presentations, workshops, attach hard copy evidence at the end of this document.

### Role Assignment: Extension & Outreach 51%

**Planned Activities for this CFES year:** June 15, 2015 – June 14, 2016

| Planned Activities | Planned Evidence of Accomplishment | Planned Evaluation By |
|---|---|---|
| **1. Insect Diagnostic Services**<br><br>Identify insects and make control recommendations when requested. | Records of insect identifications and control recommendations, some in the form of iNaturalist observation postings. | Jim Hollyer |
| **2. Detection and Documentation of Invasive Species**<br><br>Continue adding to and maintaining the Guam Invasive Species Alerts fact sheet series. | Publish Guam Invasive Species Alerts fact sheets | Jim Hollyer |
| **3. University of Guam Insect Collection**<br><br>Continue curation and databasing of the UOG Insect Collection. | none | Jim Hollyer |
| **4. Guam Coconut Rhinoceros Beetle Project** | presentations, technical reports, journal articles | Jim Hollyer |
| **5. National Plant Diagnostic Network (NPDN)**<br><br>Participate in monthly conference calls.<br><br>Train and certify First Detectors.<br><br>Attend the NPDN National Conference in Washington, D.C., March 8-12, 2016. | none | Jim Hollyer |
| **6. Guam Invasive Species Advisory Committee (GISAC)** | GISAC meeting minutes | Jim Hollyer |

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| Participate in GISAC meetings. | | |
| **7. Public Outreach (Guest lectures, presentations, interviews)**<br><br>Provide accurate scientific and technical information to the public as required. | Radio, TV, and newspaper articles | Jim Hollyer |
| **8. Public Outreach(Internet)**<br><br>Assist in migrating the CNAS-RE WordPress test site on DreamHost to a more permanent home.<br><br>Phase out use of the ANR Drupal site and move content to the new CNAS-RE WordPress Site. | None. | Jim Hollyer |

**Activities that were planned above the year before and these are the Actual Activities that took place during the evaluation period:** June 15, 2015 – June 14, 2016

| Actual Activities | Actual Evidence of Accomplishment | Actual Evaluation By |
|---|---|---|
| **1. Insect Diagnostic Services**<br><br>The number of extension calls requiring my assistance during the reporting year averaged approximately three per day.<br><br>During this reporting year, my USDA-APHIS cooperator workload was very high because the Guam Territorial Entomologist retired and there was a campaign to intercept pests arriving withthe Pacific Festival of the Arts. | Insect diagnostic cases documented as iNat observations: [1]<br><br>Press stories on flies discovered in nipa leaves imported from the Philippines for FestPac: [2, 3, 4, 5, 6]<br><br>On May 26, 2016 I wrote a press release with Olympia Terral, intended to highlight cooperation among GCQA, Guam Agriculture, USDA-APHIS, and UOG: [7]<br><br>Press stories triggerred by the above press release: [8][9] | Jim Hollyer |
| **2. Detection and Documentation of Invasive Species**<br><br>Added a page to the CNAS-RE web site which links to the Guam Invasive Species Alerts fact sheets. [10]<br><br>Prepared a fact sheet for Vespa tropica. [10] | References provided. | Jim Hollyer |
| **University of Guam Insect Collection**<br><br>I have begun evaluating Specify as an online database for the UOG Insect Collection. iDigBiorecommends Specify as the online collection database of choice for small biological collections.<br><br>Whenever, taxonomists visit Guam, I recruit their expert help to improve the collection. Dr. Mary-Liz Jamison and Dr. Josh Dunlap visited during January 14-16, 2016 and worked on the scarab beetles. Dr. Peter Maddison visited Guam June 23-29, 2016 and put together a | Sorted and identified specimens. | Jim Hollyer |

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| synoptic collection of common insects using specimens collected by students. | | |
| **4. Guam Coconut Rhinoceros Beetle Project**<br><br>Discovery of arboreal breeding of CRB on Guam:<br>• Refereed journal article published [12, hard copy provided]<br>• Prepared press release and web post with Olympia Terral [13]<br>• Press articles : [14, 15, 13]<br><br>Radio-tracking CRB to find cryptic breeding sites:<br>• Referred journal article submitted [16]<br>• Press release and generated articles. [17][18] [19][20]<br><br>Discovery of the CRB-Guam biotype:<br>• Whitepaper prepared as requested by the Western IPM Center [21]<br>• Discovery of the CRB-Guam biotype announced at a Society for Invertebrate Pathology meeting [22]<br>• Fact sheet on CRB-G prepared for SPC [23]<br>• Made a presentation on CRB-G and participated in discussions on a coordinated responseto CRB-G at the Pacific Plant Protection Meeting in Fiji, September 2015. [24]<br>• In June 2016, I attended a meeting on CRB Biocontrol in Fiji. I made a presentation on<br>CRB-G and discussed a | References provided. | Jim Hollyer |

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| coordinated response to CRB-G with participants from SPC, PNG, Solomon Islands, and Samoa. I compiled an online repository of materials from this meetingon my Open Science Framework site. [25]<br><br>Movement of packaged soil as a dispersal pathway for coconut rhinoceros beetles:<br>• Refereed journal article submitted and accepted [26]<br>• Press release and web article prepared with Olympia Terral [27]<br>• RPress articles generated: [28, 29, 30] | | |
| **5. National Plant Diagnostic Network (NPDN)**<br><br>Participated in monthly conference calls.<br><br>Submitted an article to the Pacific Pest Detector Newsletter [31].<br><br>Trained and certified students as First Detectors via a module in my Fall 2015 AG/BI 345 course.<br><br>Attended the NPDN National Conference in Washington, D.C., March 8-12, 2016. | Conference call minutes, article in Pacific Pest Detector Newsletter, National Certified First Detector List | James Hollyer |
| **6. Guam Invasive Species Advisory Committee (GISAC)**<br><br>Participated in meetings. | GISAC meeting minutes | Jim Hollyer |
| **7. Public Outreach (Guest lectures, presentations, interviews)**<br><br>During the reporting period I was interviewed numerous times by newspaper re-porters, radio talk show hosts, and television news reporters. Most, but not all involved | A Google news archive search for pages containing “Aubrey Moore” and “Guam” posted between June 15, 2015 and June 14, 2016 returned 23 results. [32] | Jim Hollyer |

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| questionsabout the Guam coconut rhinoceros beetle and other invasive species issues. I helped to produceseveral fact sheets and articles for public print media. | | |
| **8. Public Outreach(Internet)**<br><br>The CNAS-RE test site http://guaminsects.net/wp was moved to its more permanent home https://cnas-re.uog.edu during August 2015.<br><br>Some content, bibliographic information for instance, was imported into the CNAS-RE site from ANR site. | | Jim Hollyer |

**Role Assignment:** Creative/Research/Scholarly 34%

**Planned Activities for this CFES year:** June 15, 2015 – June 14, 2016

| Planned Activities | Planned Evidence of Accomplishment | Planned Evaluation By |
|---|---|---|
| **1. Coconut Rhinoceros Beetle (CRB) Biocontrol**<br><br>Complete bioassays to recheck pathogenicity of previously tested OrNV samples from AgResearch New Zealand. This task is already included in the work plan for 2 of my grants.<br><br>As per an action item from the WIPM CRB IPM meeting in Honolulu, I will work with Sean Marshall (AgResearch NZ) and Maclean Vaqalo (SPC) on generating a white paper prioritizing applied research needs for CRB management.<br><br>I plan to attend the Pacific Plant Protection Conference as a technical rep for Guam and willmake a presentation based on the white paper.<br><br>I will work to set up an international collaborative project with the goal of mapping the CRB-Guam biotype and finding a strain of OrNV wich can be used as an effective biocontrol agent. Potential collaborators are AgResearch NZ, SPC, Philippine Coconut Authority, and USDA. This project will have a foreign exploration component which will collect CRB and virus samples throughout the Asian/Pacific region. Genotyping and virus detection will done by AgResearch NZ. Bioassays in which CRB-Guam beetles will be | None | Jim Hollyer |

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| challenged with virus candidates will be done in my laboratory at UOG.<br><br>I will set up an insect pathology lab and recruit Ian Iriarte as a graduate assistant to run bioassays.<br>I have already applied to US Forest Service for $20K to fund this assistantship. | | |
| **2. Cycad Aulacaspis Scale Biocontrol**<br><br>Evaluate the impact of Arrhenophagus sp. on the Guam cycad population<br><br>Write and submit a peer-reviewed scientific journal article entitled something like **Fortuitous introduction of the parasitoid *Arrhenophagus* sp. to Guam and its impact on cycas aulacaspis scale, *Aulacaspis yasumatsui*, infesting endemic cycads, *Cycas micronesica*.**<br><br>If Ron Cave is willing to collect Coccobius fulvus again and if APHIS approves, attempt a direct field release of this parasitoid. | none | Jim Hollyer |
| **3. Guam Forest Insect Survey**<br><br>The objective of the proposed survey is to build a knowledgebase on insects associated with plants in Guam's forests. The survey will result in a reference collection of Guam'sforest insects and a publicly available online database to facilitate sharing of specimen data, images and ecological associations among plants and insects. The knowledgebase will be usefull to natural resource managers | none | Jim Hollyer |

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| responsible for maintaining the health of Guam's forests and to biologists trying to understand Guam's terrestrial ecosystems in the wake of major biological invasions. | | |
| **4. Eight Spot Butterfly Conservation**<br><br>Propagate and maintain at least 100 plants of each of the eight-spot's known host plants, *Procrispendunculata* and *Elatostema calcareum* in a plant nursery.<br><br>Establish a self-sustaining, caged, breeding colony of eight-spot butterflies using 30 field-collectedcaterpillars reared on plants from the nursery.<br><br>Propagate host plants throughout two 10 x 10 meter, wooded limestone areas at the University of Guam's Agricultural Experiment Station in Yigo.<br><br>Release 60 cage-reared eight-spot butterflies and larvae on protected host plants. | None | Jim Holler |

**Activities that were planned above the year before and these are the Actual Activities that took place during the evaluation period:** June 15, 2015 – June 14, 2016

| Actual Activities | Actual Evidence of Accomplishment | Actual Evaluation By |
|---|---|---|
| **1. Coconut Rhinoceros Beetle (CRB) Biocontrol**<br><br>We have gone through 4 cycles of the witch's brew bioassays and the mortality increases for each iteration. Gut samples from beetles are being sent to AgResearch NZ to test for OrNV. | technical reports, etc. References provided in the Actual Ativities column | Jim Hollyer |

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| White paper was written [37] and used as a source for the SPC fact sheet on CRB .<br><br>Made a presentation on CRB-G and participated in discussions on a coordinated response to CRB-G at the Pacific Plant Protection Meeting in Fiji, Sepember 2015. [24]<br><br>I continue working to set up an international collaborative project with the goal of mapping the CRB-Guam biotype and finding a strain of OrNV wich can be used as an effective biocontrol agent. Potential collaborators are AgResearch NZ, SPC, Philippine Coconut Authority, and USDA. This project will have a foreign exploration component which will collect CRB and virus samples throughout the Asian/Pacific region. Genotyping and virus detection will done by AgResearch NZ. Bioassays in which CRB-Guam beetles will be challenged with virus candidates will be done in my laboratory at UOG.<br><br>I recruited Ian Iriarte as a graduate assistant to run bioassays and have secured one year of support from my FY16 Farm Bill grant. | | |
| **2. Cycad Aulacaspis Scale Biocontrol**<br><br>Journal article not written due to lack of time.<br><br>Made direct releases of *Coccobius fulvus* at Ritidian in September and November 2015. *C. fulvus* has not been reared from recent leaf collections, so there is no proof that | No evidence provided. | Jim Hollyer |

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| this parasitoid has established. | | |
| **3. Guam Forest Insect Survey** | Please see McIntire Stennis FY2015 Annual Report [38, hard copy provided] | Jim Hollyer |
| **4. Eight Spot Butterfly Conservation**<br><br>Twelve Procris plants were collected and propogated by Lauren Guttierez. These plants were delivered to the Yigo Ag. Expt. Stn. and were immediately attacked by Cuban slugs. Prior to this observation, introduced slugs were not considered as serious competitors for 8-spot butterfly host plants.<br>2. A contract was written to support Lauren Guttierez as a collaborator on the project. Guttierez's role is to collect and propogate host plants. Due to beaurocratic delays, the contract has not yet been signed by UOG.<br>3. In November 2015, Hypolimnus octocula marianensis was list by the US Fish and Wildlife Service as an endangered species. A permit is now required to perform scientific work aimed at conserving this species. A permit application has been written [39]. | Surviving Procris plants are growing in front of ALS105.<br><br>Permit application pending. | Jim Hollyer |

**Role Assignment:** Instruction 0%

**Planned Activities for this CFES year:** June 15, 2015 – June 14, 2016

| Planned Activities | Planned Evidence of Accomplishment | Planned Evaluation By |
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**Activities that were planned above the year before and these are the Actual Activities that took place during the evaluation period:** June 15, 2015 – June 14, 2016

| Actual Activities | Actual Evidence of Accomplishment | Actual Evaluation By |
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| 1. | | |
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**Role Assignment:** Community Service 15%

**Planned Activities for this CFES year:** June 15, 2015 – June 14, 2016

| Planned Activities | Planned Evidence of Accomplishment | Planned Evaluation By |
|---|---|---|
| **1. Instruction**<br><br>I will teach General Entomology AG/BIO-345 during the Fall 2015 term. This is a 4 credit course consisting of 2 lectures per week plus a 3 hour lab session.<br><br>I plan to have Ian Iriarte as my first masters student in the EV program. | Student evaluation. | Jim Hollyer |
| **2. Service as a Reviewer** | None. | Jim Hollyer |
| **3. University Technical Advisory Committee**<br><br>I will continue to serve on UTAC as the representative for the College of Natural and Applied Sciences. | UTAC meeting minutes | Jim Hollyer |
| **4. Faculty Building Facilities Committee for ALS** | None. | Jim Hollyer |

**Activities that were planned above the year before and these are the Actual Activities that took place during the evaluation period:** June 15, 2015 – June 14, 2016

| Actual Activities | Actual Evidence of Accomplishment | Actual Evaluation By |
|---|---|---|
| **1. Instruction**<br><br>I taught General Entomology AG/BIO-345 during the Fall 2015 term.<br><br>I reccruited Ian Iriarte as my first masters student in the EV program and secured support for his first year from my FY2016 Farm Bill grant (CRB-G Biocontrol). | Syllabus for General Entomology AG/BIO-345. [40]<br><br>Web site for General Entomology AG/BIO-345 (static web site built using Pelican) [41].<br><br>Student evaluation for General Entomology AG/BIO-345. My score (3.63) was above the university average (3.55) and the CNAS average (3.48). | Jim Hollyer |
| **2. Service as a Reviewer** | References provided. | Jim Hollyer |

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| Acted as external examiner for master's student John Tuivavalagi, University of Queensland. I was an external examiner of his thesis entitled Investigating **The impacts of the natural enemy *Trichogramma chilonis* Ishii on populations of *Crocidolomia pavonana* in Samoa.** [42]<br><br>2. In September 2015: I acted as peer reviewer for Public Library of Science (PLoS) manuscript PONE-D-15-29086R1 **Insect Biometrics: Optoacoustic signal processing and its applications to remote monitoring of McPhail type traps.** submitted by Ilyas Potamitis.<br><br>3. In July 2016: I acted as peer reviewer for Journal of Medical Entomology manuscript JME-2016-0177 2D **Optoacoustic sensors embedded in mosquito insectary cages report species identity through wingbeats.** submitted by Ilyas Potamis et al. [43] | | |
| **3. University Technical Advisory Committee**<br><br>I continue to serve on UTAC as the representative for the College of Natural and Applied Sciences. | | Jim Hollyer |
| **4. Faculty Building Facilities Committee for ALS**<br><br>I became chair of this committee when Dr. Laura Biggs left during 2015.<br><br>Documented air conditioning problems, especially exessively high humidity (>60% RH) and met with Dr. Rachel Leon Guerrero and Jesse Rosario to discuss possible solutions | Recommendations for improving the ALS 124 as a science teaching environment [44] and obtained<br>a quote for installation of audiovisual equipment. | Jim Hollyer |

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| Procured a large screen HDTV for the teaching lab (ALS 124) (Thanks to Jim Hollyer for help with this)<br><br>Installed Internet cable to provide sufficient bandwidth for streaming video (Thanks to Rudy Magallanes for help with this)<br><br>Organized clean up of the teaching lab following the Fall 2015 semester.<br><br>Compiled recommendations for improving the ALS 124 as a science teaching environment. | | |

# Comprehensive Faculty Evaluation System – Part III

**Summary of Publications and Grant Activities**

On this page, list specific outputs generated during the evaluation period so that they can be entered into the CNAS website databases.

**Publications and other media produced during the review period**

**1. Peer Reviewed Journal Articles**

Moore et al. 2015. Coconut rhinoceros beetles (Coleoptera : Scarabaeidae) develop in arboreal breeding sites in Guam. Florida Entomologist 98(3) 1012-1014. [12]

Moore et al. 2016. Movement of packaged soil products as a dispersal pathway for coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera:Scarabaeidae) and other invasive species. Proceedings of the Hawaiian Entomological Society [In press]. [26]

Moore et al. 2016. Judas beetles: Discovering cryptic breeding sites by radio-tracking coconut rhinoceros beetles, *Oryctes rhinoceros* (Coleoptera: Scarabaeidae). Journal of Environmental Entomology [Submitted] [16]

**2. Fact Sheets**

Moore et al. (2014-2016) Guam Invasive Species Alert Series. [10]

Vaqalo, M., Marshall, S., Jackson, T., & Moore, A. (2015). An emerging biotype of coconut rhinoceros beetle discovered in the Pacific (Pest Alert No. 51) (p. 2). Secretariat of the Pacific Community. [23]

Moore, A. (2015). The new Pacific pests and pathogens app. In Pacific Pest Detector News 23.[31]

**3. Presentations**

Ares, M. A., Meneses, N., Smith, A., Moore, A., & Benford, R. (2015). Molecular Identification of a Lepidopteran Herbivore on a Critically Endangered Tree. Northern Arizona Undergraduate Symposium 2015. [45]

Marshall, S. D. G., Vaqalo, M., Moore, A., Quitugua, R., & Jackson, T. A. (2015). A new invasive biotype of the coconut rhinoceros beetle (Oryctes rhinoceros) has escaped from biocontrol by *Oryctes rhinoceros* nudivirus. In International Congress on Invertebrate Pathology and Microbial Control and the 48th Annual Meeting of the Society for Invertebrate Pathology. Retrieved from [22]

Moore, A. (2015). A report on the Guam coconut rhinoceros beetle infestation for the 8th Pacific Plant Protection Organisation Board Meeting and 16th Regional Technical Meeting on Plant Protection. Nadi, Fiji. September 21-25, 2015.

Moore, A, (2015). Update on the Guam Coconut Rhinoceros Beetle for the Guam Invasive Species Council. Guam, November 20, 2015. [46]

Aubrey Moore. (2016, March). Guam Report. Presented at the National Plant Diagnostics Network Meeting, Washington, D.C. [47]

Aubrey Moore. (2016, April). New variant of rhinoceros beetle, Guam biotype, and implications for global control. Presented at the Annual Meeting of the Pacific Branch of the Entomological Society of America, Honolulu, Hawaii. [48]

Aubrey Moore. (2016, June). Discovery of the Coconut Rhinoceros Beetle Guam Biotype and Implications for Global Control. Presented at the Future proofing the palm industries: Limiting damage by existing (CRB-P) and invasive (CRB-G) coconut rhinoceros beetle (*Oryctes rhinoceros*) in the Pacific, Suva, Fiji. [49]

**Grants applied for during the review period**

USDA-Aphis Biocontrol Program: Oryctes nudivirus for biocontrol of the Guam biotype of the coconut rhinoceros beetle.; $20,000 requested; Not funded; Proposal[50]

2015-16 USDA Farm Bill: Oryctes nudivirus for biocontrol of the Guam biotype of the coconut rhinoceros beetle; $120,000 requested; $100,000 awarded; Work plan [51]

US Forest Service: Detector Beetles: Radio-Tracking Coconut Rhinoceros Beetles (CRB) to Discover Breeding Sites and CRB Biocontrol; $40,000 requested; $40,000 awarded; Proposal [52]

McIntire-Stennis. Guam Forest Pest Survey. $5,000

Dean's 2016 High-impact Project Pool Competition: Coconut rhino beetle as a transmission vector for Tinangaja disease.; $39,911 requested; $39,911 awarded; Proposal [53]

US Fish and Wildlife Service FY2016 (funds passed through GDOA-DAWR via an MOU): Establishment of Captive and Establishment of Captive and Managed Populations of Mariana Eight-spot Butterfly;$18,000 requested; $18,000 awarded; Work Plan [54]

**Grants won during the review period**

As indicated above, applied for 6 grants with a total request of $242,911. I was funded on 5 grants totalling $202,911.