This is provided as an example proposal.
It is important that you follow the current guidelines.

The mentor letter has been removed.
A PROPOSAL TO STUDENT ENHANCEMENT AWARD REVIEW COMMITTEE

TITLE OF PROJECT: Natural Selection on the Damselfly Banded Demoiselle

NAME OF APPLICANT: McKaila Boarman

STATUS: Undergraduate Graduate Medical

CAMPUS/LOCAL ADDRESS: 107 Irvine Hall, Ohio University, Athens, OH 45701

E-MAIL ADDRESS: mb148109@ohio.edu

DEPARTMENT: Biological Sciences

EXPECTED GRADUATION DATE (Month and Year): December 2016

RE-SUBMISSION: YES (Original Submission Date 01/2015) NO

PROPOSAL CATEGORY (select one):

- Life/Biomedical
- Social/Behavioral
- Arts/Humanities
- Physical Sciences/Engineering

BUDGET: Total Request $6,000 (May not exceed $6,000)

FACULTY MENTOR INFORMATION:

NAME: Shawn R. Kuchta

E-MAIL ADDRESS: Kuchta@ohio.edu

CAMPUS ADDRESS: 233 Life Sciences Building

DEPARTMENT: Biological Sciences

DEPARTMENT ADMIN./EMAIL: Kaaz@ohio.edu

IRB AND IACUC APPROVAL:
To ensure that the University is in compliance with all federal regulations, complete the checklist below. Note: your proposal can be approved prior to IRB or IACUC approval (put "pending" or "to be submitted" instead of approval number), but funding will be withheld until notification of approval or exemption.

<table>
<thead>
<tr>
<th>Yes No</th>
<th>Office of Research Compliance</th>
<th>Policy #</th>
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<tbody>
<tr>
<td>X</td>
<td>Human Subjects in Research (including surveys, interviews, educational interventions): Institutional Review Board (IRB) Approval #: Expiration Date:</td>
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<tr>
<td>X</td>
<td>Animal Species: Institutional Animal Care &amp; Use Committee (IACUC) Approval #: Expiration Date:</td>
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SIGNATURES

<table>
<thead>
<tr>
<th>Applicant’s Signature</th>
<th>Faculty Mentor’s Signature</th>
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<tbody>
<tr>
<td>Signature</td>
<td>Signature</td>
</tr>
<tr>
<td>Name</td>
<td>Shawn R. Kuchta</td>
</tr>
<tr>
<td>Dept/School</td>
<td>Unit</td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
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</table>

Optional:
If selected for funding, I give permission to the Office of the Vice President for Research and Creative Activity to use my proposal as an example during training and workshop exercises. (Sign below)

Signature: McKaila Boarman Date: 01/19/2016
# STUDENT ENHANCEMENT AWARD

## APPLICATION CHECKLIST

Applicants **must** complete and sign the checklist. The checklist should be included as the second page of the application (following the cover page).

<table>
<thead>
<tr>
<th>Item</th>
<th>Pages/Limit</th>
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<tbody>
<tr>
<td>Cover page</td>
<td>use SEA form</td>
</tr>
<tr>
<td>Checklist</td>
<td>use SEA form</td>
</tr>
<tr>
<td>Abstract*</td>
<td>1 double-spaced page</td>
</tr>
<tr>
<td>Resubmission Summary <em>(For Re-submissions Only)</em></td>
<td>1 double-spaced page</td>
</tr>
<tr>
<td>Project Narrative</td>
<td>5 double-spaced pages</td>
</tr>
<tr>
<td>Glossary/Definition of Terms* <em>(Not required)</em></td>
<td>2 double-spaced pages</td>
</tr>
<tr>
<td>Bibliography <em>(Not required)</em></td>
<td>2 pages</td>
</tr>
<tr>
<td>Presentation of Results</td>
<td>1 double-spaced page</td>
</tr>
<tr>
<td>Mentor’s Endorsement</td>
<td>1 page</td>
</tr>
<tr>
<td>Biographical Information <em>(Applicant(s) and key personnel)</em></td>
<td>3 pages per person</td>
</tr>
<tr>
<td>Budget and Justification</td>
<td>no limit specified</td>
</tr>
<tr>
<td>Appended Materials/Multimedia Files</td>
<td>5 pages; and no more than 10 minutes of footage</td>
</tr>
<tr>
<td>Electronic copy of proposal</td>
<td>Single Acrobat file, containing entire proposal and required signatures</td>
</tr>
</tbody>
</table>

Sections marked with a bullet (*) identify text sections that should be written in language understandable by an informed layperson to assist the Committee in its review.

**Please Note: The committee has the right to return without review any proposals that do not conform to these format requirements**

Applicant signature: [Signature]

Date: 01/20/2010
Abstract- Natural selection is a multifaceted process in which organisms possessing traits better suited to an environment tend to survive and reproduce at a higher rate than organisms lacking those traits. Sexual selection is a difference in mating success among members of the same sex. The interplay between natural selection and sexual selection can result in countervailing selective pressures on the same traits. For instance, while the bright, conspicuous plumage of a male bird is effective at attracting a mate, it might also attract the attention of a predator. This cost-benefit relationship between an individual’s mating success and their risk of predation is of critical importance for understanding why animals have evolved to look the way they do, yet it has been little studied in the wild. This study aims to quantify the trade-off between sexual selection and predation risk in a damselfly called the Banded demoiselle (Calopteryx splendens). Banded demoiselles are sexually dimorphic, meaning that males and females physically differ in appearance. Males possess a dark, iridescent color patch on each wing that plays an important role in mate attraction. Their main predator is a small bird known as the White Wagtail (Motacilla alba). This bird captures damselflies in flight, then flies to feeding stations where it removes the wings prior to consumption of the body. For this study I will compare these wings to a random sample of wings from the population, which will allow me to quantify the strength and direction of natural selection on males by a known predator. Similarly, by comparing wings of individuals that are in the process of mating to a random sample, I can quantify the strength and direction of sexual selection on male wings. With this data, I can test for a trade-off between natural and sexual selection using advanced multivariate statistical methods.
Resubmission Summary

I have changed various aspects of my proposal in accordance with the feedback that I received from the review committee after my last proposal submission. Firstly, I included a letter of participation and a CV from my collaborator on the project, Dr. Erik Svensson. Additionally, I included the necessary paperwork for international travel through Ohio University.

The project narrative itself is largely unchanged, though I attempted to clarify any details that the committee was unsure on in my previous submission. I was also able to provide more specific information on obtainable sample sizes for each field season, as I completed my first field season last summer, subsequent to submitting my first grant proposal.
Project Narrative

Introduction- Competition for mating success leads to the evolution of physical differences between the sexes in many species, a phenomenon called sexual dimorphism. Evidence of this abounds, from the magnificent, colorful display of the male peacock to the vast difference in body size between male and female elephant seals (Michael et al. 1994, Schillaci 2006). While conspicuous traits in males are effective at attracting mates, they often come at a cost (Allen et al. 2007, Stuart-Fox et al. 2003): what serves to attract the attention of the opposite sex is also likely to attract predators. However, this trade-off between sexual selection and natural selection by predators has been little studied in the wild because it is very difficult to observe predation and mating success in nature, and because predation often leaves little left to measure.

I am undertaking a study of the relationship between sexual selection and predation in a species of damselfly (a type of small dragonfly) called the Banded demoiselle, *Calopteryx splendens*. This species is found in northern Europe, and my study site is in southern Sweden. At this study site, males possess a dark, iridescent color patch that takes up about 50% of the wing. Females have transparent wings that lack a color patch. The size, color, and opacity of the color patch in males varies between individuals and populations, and it is used in male-male interactions and for mate attraction (Tynkkynen et al. 2004).

The population of Banded demoiselles I am studying has one main predator: a small bird called the White Wagtail (*Motacilla alba*). When a Wagtail catches a damselfly, it takes it to a feeding site (which the Swedes referred to as a "slaughter station", along the bank of a stream (Fig.1), where it removes the wings and ingests the body of the insect. The wings are left fully intact on the side of the stream. These
wings are abundant and easily found: wings from 456 individuals were recovered from slaughter stations during my 2015 field season. Wings serve an array of diverse functions in damselflies. The size and shape of wings is thought to have a strong effect on flight performance (Kuchta and Svensson 2014), and thus has a large impact on the ability of damselflies to escape aerial predators (Wootton and Newman 2008). On the other hand, the patch of color on the wing is thought to strongly influence mating opportunities.

The mating system of damselflies lends itself to a study of sexual selection. When a male finds a willing female partner, he grasps her directly behind the head with the four terminal appendages at the end of his abdomen. The female then extends her abdomen around and beneath the male until their sex organs meet on the thorax of the male (Fig. 2). This process, called copulation, can last for up to 20 minutes and occurs out in the open, making the capture of pairs in copula feasible. A total of 103 pairs of copulating damselflies were caught over the course of the 2015 field season.

Objectives/Hypotheses- My study focuses on the interaction between a damselfly’s mating success and its likelihood of being captured by a predator. This study is of significance because the quantification of both natural selection and sexual selection has only rarely been done, and yet it is commonly hypothesized that the two forms of selection will often conflict with one another. The study aims to fulfill the following objectives: (1) Compare wings collected from slaughter stations to those of random individuals from the population to quantify the strength and direction of natural selection by a known predator. (2) Compare wings collected from males while they are in copula (during the act of mating) to a random sample of wings from the population to quantify the strength and direction of sexual selection. (3) After quantifying both
natural selection and sexual selection, compare the findings to test for potential trade-offs between natural and sexual selection. For example, if males with large color patches on their wings are more likely to be found mating with females, but are also more likely to be found at Wagtail feeding sites, this indicates there is a trade-off: large wing patches increase the chance of successful mating, but at the cost of increased risk of predation.

This study builds on work conducted over the past five years by Dr. Erik Svensson (Lund University, Sweden) and my graduate advisor, Dr. Shawn Kuchta. Recent studies by Svensson and Friberg (2007) and Kuchta and Svensson (2014) have shown that natural selection by Wagtails is stronger on wing patch traits than on overall size or shape, suggesting that there is a trade-off between natural selection and sexual selection. However, sexual selection has never been quantified in this system. I hypothesize that there is a trade-off occurring between natural selection by predators and sexual selection on the wing size and color of the wing patch.

I completed one season of data collection for this project during the summer of 2015. By the end of the field season I had processed upwards of 2,000 random individuals from the population, in addition to 123 copulating pairs and wings from 456 depredated individuals. I will place particular emphasis on the acquisition of mating pairs during the upcoming field season, as that is the group in need of greater sampling.

**Materials and Methods** - Data collection will take place in Lund, Sweden, from June 1st through August 1st, 2016. No permits are required for this project, as Sweden has no restrictions on use of invertebrates for scientific study. Every day I will collect the wings from slaughter stations, capture mating pairs of males and females, and randomly sample the live demoiselle population. Random samples are simply solo individuals flying around the study site that are captured with a butterfly net. By spreading the wings of a live damselfly across the bed of a scanner, it is possible to obtain a clear image of each wing without harming the damselfly. With this
methodology I can efficiently obtain large quantities of high resolution images from all three sample groups. Before releasing each damselfly, I will mark its thorax with a small dot of acrylic paint to prevent accidental recapture. Finally, the color of each wing patch is scored in the field by comparing wing patches to a series of precise color standards. After I return from Sweden, I will use geometric morphometric techniques (Zelditch et al. 2012) to quantify the size and shape of each wing and wing patch. This method enables me to take very detailed measurements of shape and size that cannot be achieved with traditional methods such as length or width measurements. Specialized computer software will be used to place small points on each wing, which can later be used for statistical analyses (Fig.3). Finally, I will quantify the strength and direction of natural selection and sexual selection using multivariate statistical methods, including multiple regression, principal component analysis (Lande and Arnold 1983), and partial least squares analysis (Kuchta and Svensson, 2014).

**Broader Impact** - The natural history of the Banded demoiselle presents a rare opportunity to simultaneously study natural selection and sexual selection in a natural population. I will thus be able to test for a trade-off between natural selection and sexual selection. Though this trade-off is often hypothesized, it has only rarely been studied in the wild. Indeed, due to the paucity of convincing studies, some have even questioned the reality of this postulated trade-off (Kotiaho 2001). I will publish my results in a top tier scientific journal, and present my findings at a meeting for the Society for the Study of Evolution, and at the Student Research and Creative Activity Expo at Ohio University.
Glossary

Copulation: Sexual intercourse

Geometric morphometrics: The analysis of shape using Cartesian geometric coordinates rather than linear, areal, or volumetric variables. Provides a quantitative way to compare shape variables.

Reproductive success: The ability to successfully attract and mate with a member of the opposite sex to produce offspring and pass on genes to the next generation.

Natural selection: A process in which organisms possessing certain traits that make them better suited to an environment tend to survive and reproduce, passing on those traits to the next generation.

Sexual dimorphism: The differences in appearance between the sexes of the same species, as in color, shape, size, and structure, that are caused by the inheritance of one or the other sexual pattern in the genetic material. Often arises as a result of sexual selection.

Sexual selection: A type of natural selection in which preference by one sex for certain traits in the opposite sex leads to preservation or exaggeration of that trait in the species.

Slaughter station: A feeding site along the bank of a stream where Wagtail birds take their damselfly prey, remove the wings, and ingest the body.

Trade-off: A situation in which positive changes in one trait result in negative consequences for another trait, and vice versa.
Literature Cited


Presentation of Results

The results of this study will be published as a paper in a reputable scientific journal and will be presented at an annual meeting of the Society for the Study of Evolution (SSE). The SSE aims to promote the study of evolution, and they hold an annual meeting in which scientific findings in the evolutionary field are presented and discussed. Meetings like this allow me an opportunity to present the results of my project to prominent scientists in my field and get feedback for potential research in the future. I will get further feedback from the scientific community after the publication of my results in a scientific journal. This is also the most efficient means of spreading the information gleaned from my study throughout the scientific community.

I will also present the results of my study at the Student Research and Creative Activity Expo at Ohio University in 2016. This annual event is held by Ohio University every year and brings together a large group of researchers with a broad variety of specializations to present their work. This event will allow me to disseminate the findings of my research widely, both to other scientists and to people outside of my field who may otherwise never be exposed to research like mine.
Principal Investigator's Biographical Information

McKaila Boarman
231 Life Sciences Building
Athens, OH 45701
440.341.3230
MB148109@ohio.edu

Education

Graduate-

* Ohio University  Anticipated date of graduation: December 2016
  * Masters Student in Ecology and Evolutionary Biology
  * Academic Advisor: Dr. Shawn R. Kuchta
  * Current GPA: 3.87

Undergraduate-

* Ohio University  Class of 2013
  * Degree: Bachelor's of Science
  * Major: Wildlife and Conservation Biology

Graduate Level Courses
BIOS 5780 Community Ecology
BIOS 6820 Advanced Biostatistics Seminar
BIOL 55111 Analysis of the Organismal Form (Online morphometrics course offered through the University of Manchester)

Grants Pending  None

Research Experience

* Field work for Masters Thesis  (June1-August1, 2015) I spent the summer of 2015 in Lund, Sweden collecting data for my master's thesis. Work involved collection of wings from depredated damselflies, and collecting high resolution images of wing morphology in the population.

* Field Research Assistant Lund, Sweden  (June 1-July 1, 2014) I acted as a field research assistant under John Waller, a PhD candidate in the lab of Dr. Eric Svensson at Lund University in southern Sweden. We worked on a project looking at evolutionary pressures present on a population of damselflies (Calopteryx splendens), using their wings as a metric to observe shape variation among groups in the population. My responsibilities included the capture of live damselflies, scanning images of their wings, collection of wings from predated individuals, and marking the already processed individuals in order to document recapture frequencies.
• **Research assistant** (July 2012): Assisted Vincent Farallo, PhD candidate at Ohio University doing fieldwork in the Smoky Mountains. We studied microhabitat preferences of Plethodon salamanders in select locations in Virginia, Tennessee, and North Carolina. Much of the trip was based out of Purchase Knob research center in the Great Smoky Mountains National Park. My duties included finding and identifying specimens and taking extensive data on the micro-habitat (e.g. soil moisture, temperature). In order to gather microhabitat data I used a Hydrosense II soil moisture meter, probe thermometer, clinometer, densitometer, and Kestral weather meter.

• **Undergraduate evolutionary biology lab research assistant** (August 2011 – 2013): As an undergrad I participated in a research project analyzing morphometric variation in relation to predation rates in damsel fly wings in the lab of Dr. Shawn Kuchta at Ohio University. I completed a study analyzing phenotypic plasticity in spotted salamander (*Ambystoma maculatum*) larvae using geometric morphometrics. I compared the morphology of the larvae in the presence and absence of predators (dragon fly nymphs) in order to find out if there is a significant morphological difference in their rates of development as a result of predator pheromones.

• **Undergraduate Research Immersion Program (UGRP)** (January-June 2012) UGRP is a program at Ohio University designed to expose students to formal research experience and provide an opportunity to meet and interact with well-established researchers in their chosen field of study. It involves a formal lecture by a professor or graduate student that is then followed by an informal opportunity for participating students to ask questions and speak privately with that week’s lecturer about their research.

**Teaching Experience**

PBIO 3150 Tutor for Statistical Methods in Plant Biology *Spring 2012*

BIOS 1705 Primary instructor for two sections *FALL 2014*

**Comparative Vertebrate Anatomy** I was a TA for one section of comparative vertebrate anatomy (BIOS 3030) during the Spring of 2015, and am currently teaching the class for a second time.
Collaborating Professor’s CV
Erik Svensson

Present position: Professor in Animal Ecology, Lund University, SWEDEN
Present address: Department of Biology, Evolutionary Ecology Unit, Lund University,
Sölvegatan 37, SE-223 62 Lund
Phone: +46 (0)46 222 38 19
E-mail: erik.svensson@biol.lu.se
Web site: http://www.biology.lu.se/erik-svensson

Career summary and Qualifications
2010-12 Visiting professor, Stellenbosch University, South Africa.
2008 Professor of animal ecology, Lund University, Sweden.
2003-09 Senior Research Fellow, Lund University, Sweden
2003 Visiting researcher, University of California, Santa Cruz, USA.
2000-03 Junior Researcher Fellow (funded by Swedish Research Council), Lund University.
1997-99 Postdoctoral scholar, University of California, Santa Cruz, USA.
1997 Ph. D., Lund University, Sweden

Positions of trust and scientific service
2014 - Member of National Committee for Biology, Royal Society of Sciences (KVA), Sweden.
2014-2015 Chair of Election Committee for the European Society of Evolutionary Biology (ESEB).
2011-2015 Council Member of the European Society for Evolutionary Biology (ESEB).
2014 – Founding Editorial Board of Oxford Bibliographies in Evolutionary Biology.
2010-2013 Editorial Board of Evolution.
2006-2009 Editorial Board of PLoS ONE
2003-2008 Editorial Board of Proc. R. Soc. Lond. B.

Supervision of PhD-students and postdocs
Supervisor of 9 PhD-students and 11 postdoctoral fellows (12 women and 8 men). Of the 13 that have left my research laboratory after PhD-defence and completion of their postdocs, 12 have moved on to other research positions and one works as environmental consultant.

Publications and citation information

Google Scholar: https://scholar.google.com/citations?user=66nqTEAAAAJ&hl=en
ISI Researcher ID: http://www.researcherid.com/rid/E-8324-2010
Researchgate: https://www.researchgate.net/profile/Erik_Svensson3
Budget and Justification

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<tr>
<td><strong>TRAVEL &amp; LODGING</strong></td>
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<td>Airfare to Copenhagen, Denmark for PI and her Graduate Advisor</td>
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<td>Train tickets from Copenhagen airport to Lund, Sweden, and back</td>
<td>Skonetrafiken</td>
<td>$50.00</td>
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<td>Gas to drive to and from field site</td>
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**Travel & Lodging**

- Funds are requested to travel to the location of my field site in Lund, Sweden. I will fly from Columbus International airport to Kastrup airport in Copenhagen, Denmark, which is the nearest international airport to my destination. From the airport I will take a train across the border to Lund, Sweden. Both the plane and train tickets will be round-trip, as I will follow the same route for my return trip.

- Funds are requested for gas to and from the field site every day. I will conduct my research in a rural area of Sweden, located approximately 25 miles away from the University and residential area of Lund. There is no alternate mode of transportation
available other than automobiles, so I will need to drive a total of 50 miles every to day to and from the field site.

- Funds are requested to sublease an apartment in Lund, Sweden, where I will stay during the field season. The sublease will last from June 1st through July 31st 2015, and rent will include all utilities.

Conference Travel

- Funds are requested to attend the Society for Integrative and Comparative Biology held in New Orleans, Louisiana in January of 2017. My Graduate advisor will accompany me to the conference, where I will present the findings of my study.
Form Packet for Participants on OHIO-Affiliated Travel
Office of Global Opportunities, Ohio University

PLEASE SUBMIT THIS PACKET, PLUS YOUR FLIGHT ITINERARY AND A COPY OF YOUR PASSPORT, TO OGO AT LEAST 3 WEEKS PRIOR TO DEPARTURE.

Personal Information.

Boarman, McKaila
Last, First Name
P001244063
PID (P############)
MB148109@ohio.edu
Email Address

Travel Information.

Trip Coordinator or Sponsor: Shawn R. Kuch
Purpose of Trip: Field work (data collection for master's thesis)
Number of Credit Hours to be Received (if applicable): 9
Destination City, Country: Lund, Sweden
Start and End Date of Travel: June 1, 2016 to July 20, 2016
Address Abroad (if known): Stora Fiskaregatan 6, 222 24 Lund, Sweden
Phone Number Abroad, including country and city codes (if known): N/A

If you do not have your foreign address and phone number at the time of completing this form, please email this information to global.opportunities@ohio.edu as soon as it becomes available.

Office of Global Opportunities
Walter International Education Center
15 Park Place
1 Ohio University
Athens OH 45701-2979

updated 2/10/14
Personal data.

Name: Boarman McKaila Sky
(First) (Middle)
(Last)

Date of Birth (month/day/year): 09/12/1990 PID: P001244063

Country of citizenship: USA Gender: ☐ Male ☑ Female

Major: Ecology and Evolutionary Biology Minor (if applicable): N/A

College of Enrollment (e.g. Arts & Sciences): Arts & Sciences

Anticipated academic rank when trip begins (circle one): Fr So Jr Sr M.A./M.S. Ph.D.

Local or Campus Address: 7232 Selby rd Telephone: (440)341-3230
City: Athens State: Ohio Zip: 45701 Valid through Indefinitely

Permanent Address: 7232 Selby rd
City: Athens State: Ohio Zip: 45701 Permanent Telephone: (440)341-3230

Emergency Contacts. We strongly recommend that one of your emergency contacts be the holder of a valid passport.

Ciarlillo, Alexander
Contact 1: Last, First Name
Address 7232 Selby rd.
Street
City Athens
State Ohio Zip 45701

Home Phone (740) 274-2863
Work Phone N/A
Fax N/A

Significant other
Relationship
alex.ciarlillo@gmail.com Email Address

Cuda, Chris
Father
Contact 2: Last, First Name
Address 36402 N Reserve Cir
Street
City Avon
State Ohio Zip 44110

Home Phone (440) 341-0270
Work Phone N/A
Fax N/A

Mother
Relationship
chriscuda@sbcglobal.net Email Address

Boarman, Erica
Contact 3: Last, First Name
Address 36402 N Reserve Cir
Street
City Avon
State Ohio Zip 44110

Home Phone (440) 3413205
Work Phone N/A
Fax N/A

Which of your emergency contacts is the holder of a valid passport? (check all that apply)

✓ Contact 1
Contact 2
Contact 3
Ethnicity (optional). We want to know if international opportunities are reaching a diversified student population. The following information is optional. Please check all that apply.

- African-American
- American Indian/Alaska Native
- Hispanic-American
- Asian-American or Pacific Islander
- White, non-Hispanic
- Multi-racial
- Foreign National

Confirmation of Embassy Registration

The Office of Global Opportunities requires that you register online at the Embassy or Consulate in your host country before you leave. Below are instructions for registering online.

You will need your passport number and an address abroad to register your trip.

- Go to www.travel.state.gov.
- Click on “Smart Traveler Enrollment Program (STEP).”
- Read this information describing what Consular Services can do for you. Click on “Smart Traveler Enrollment Program” and follow the directions to “Create an account.”
- Once you have completed your profile, click on “Add a trip.” Enter the details of your upcoming trip.
- For non-US citizens only: Contacted the embassy of your home country to find out about registration and other services offered. If possible, register with your embassy in host country.

I confirm that I have registered with the Embassy for the duration of my time abroad. MB 01/19/2016

Confirmation of Health Insurance Enrollment

The Office of Global Opportunities will enroll you in mandatory study abroad health insurance provided by University Health Plans (UHP). The policy provides coverage for your benefit, including health insurance, medical repatriation, accidental death and dismemberment, repatriation of remains, and medical and security evacuation.

I acknowledge my responsibility to understand the conditions and limitations of this coverage and agree that Ohio University is not responsible for any uninsured losses. I understand that I will only be enrolled for the time period indicated below. If I plan to extend my travel abroad, I may choose to extend the period of coverage at my own expense. The cost of coverage is $1.21/day (subject to small increases on an annual basis).

Details about the benefits of this policy can be found here: http://www ohio.edu/goglobal/General/healthsafety.html

If you choose to extend your coverage while you are abroad, you must send an e-mail from your OHIO email account to global.opportunities@ohio.edu.

I would like my coverage to include the following dates: 06/01/2016 to 07/15/2016

Month/day/year

Initial Here MB 01/19/2016

Confirmation of International SOS Access to Services and Notice of Possible Charges to Student Account

Whether you are traveling on a study abroad program or completing an independent project abroad, you may find cause while abroad to seek travel assistance, security advice, or evacuation services from International SOS (ISOS), a company with which OHIO has contracted for security advice and access to security and evacuation services.
ISOS offers you a network of services for immediate help in any emergency. Services range from telephone advice and referrals to full-scale evacuation by private air ambulance. The ISOS network of multilingual critical care and aero-medical specialists operates 24 hours a day, 365 days a year from ISOS Alarm Centers around the world. Access to ISOS is designed to supplement the policies, procedures and support staff that the university already has in place.

If you are traveling and/or unable to reach your program staff, you should contact ISOS for non-medical security situations. Their staff will begin to meet your needs immediately while coordinating services with OHIO.

**ISOS and Your UHP Health Insurance**

UHP works directly with ISOS to provide coverage for medical and security related events. ISOS should be your first point of contact when accessing the services listed below.

Should you have any questions about ISOS, please call 740-593-4583 or email global.opportunities@ohio.edu.

To view UHP-covered PROGRAM BENEFITS: [http://www.ohio.edu/educationabroad/general/healthsafety.html#name](http://www.ohio.edu/educationabroad/general/healthsafety.html#name).

Please be aware that those ISOS services not covered by UHP insurance come with an additional charge. Should you activate a service that has an additional charge, you authorize Ohio University to bill your student account for this charge. Please note that such charges may not appear on your account until after you have returned from your time abroad.

We suggest you log in to ISOS’s web site prior to travel:

Use your membership number (**11BCAS000010**) as your member login. In addition to the information covered at orientations conducted by OHIO or other organization with which you are traveling, the ISOS comprehensive guides provide both medical, security and general travel advice, such as information on the standard of health care, how to pay for medical care, the availability of medications, safety of the blood supply, embassy/visa information, dialing code information, cultural etiquette and financial and voltage/plug information.

I acknowledge my responsibility to understand the conditions and limitations of this service and agree that Ohio University is not responsible for any expenses I may incur as a result of activating a service that has an additional fee. Additionally, I understand that International SOS is not an insurance provider but rather provides access to information and services; insurance coverage is provided by UHP. I understand I may be billed for services utilized through International SOS that are not covered by the university’s policy with UHP.

**Signature**

**Date**

01/19/2016

**Parent/Legal Guardian Signature:** N/A

(If Participant is under 18 years old)

**Parent/Legal Guardian Printed Name:** N/A

(If Participant is under 18 years old)

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**Waiver, Release and Indemnification Agreement**

In consideration for permission to participate in this global opportunity activity (the “Activity”), I knowingly and voluntarily:

- acknowledge that there are unavoidable risks and dangers to my health and personal safety related to traveling overseas, including the possibility of domestic or international terrorism, civil unrest, political instability, disease,
public health conditions, crime, violence, hijacking, and kidnapping; I further understand and acknowledge that Ohio University cannot guarantee my safety or the safety of my property while traveling abroad;

- represent that I have reviewed the information at the U.S. Department of State website, www.travel.state.gov, and the International SOS website, www.internationalsos.com (member ID: 11BCAS000010), that is specific to the country or countries where I will be traveling and understand the additional risks and dangers present in this country or countries;
- acknowledge that travel to a country under a travel warning from the United States Department of State carries heightened risks and that permission from Ohio University to travel in such a country is neither an endorsement nor an assurance of the advisability or safety of such travel;
- acknowledge that political, social, and/or public health circumstances can change quickly in a country and it may be necessary for Ohio University or other entities to suspend travel in or to a country;
- acknowledge that the laws of the country or countries where I will be traveling may not provide for due process and individual rights to the same extent as the laws of the United States; I further understand that if I violate the laws of any country I visit, Ohio University cannot represent me or my legal interests;
- acknowledge that health care, medicines and related services may not be as readily available, or of a quality comparable to those in the United States;
- acknowledge that transportation may not be as reliable or subject to the same safety standards applicable to public carriers in the United States;
- acknowledge that public safety personnel in foreign countries may not provide a level of personal security comparable to that in the United States
- represent that I am not aware of any medical reason why I should not participate in the Activity;
- acknowledge that any University personnel or agents participating in the Activity are not necessarily medically trained to care for any physical or medical problems of individuals participating in the Activity;
- agree to follow all the safety procedures and instructions of any Activity coordinators; and
- acknowledge that my participation in the Activity is entirely voluntary.

In consideration for permission to participate in the Activity, I, on behalf of myself, my heirs and assigns, knowingly and voluntarily assume all risks associated with the Activity, assume full responsibility for any losses, damages or personal injury, including death, that may be sustained by me as a result.

I further release and forever discharge the University, and its trustees, officers, employees, and agents from all legal claims for injuries, damages, or losses of any kind, which may arise out of my participation in this Activity, to the fullest extent permitted under law, including claims of negligence on the part of the University, but not for injuries, damages or losses resulting from the University's gross negligence, or willful or wanton conduct.

I further agree to indemnify and hold harmless the University, its trustees, officers, employees and agents for any injury, damage, or losses of any kind, including court costs and attorneys' fees that may result from my negligent or intentional act or omission while participating in the Activity.

This Waiver, Release and Indemnification Agreement shall be construed in accordance with the laws of the State of Ohio.

I HAVE CAREFULLY READ THIS AGREEMENT AND UNDERSTAND IT TO BE A RELEASE OF ALL CLAIMS AND CAUSES OF ACTION FOR MY LOSS, DAMAGE OR INJURY, INCLUDING DEATH, WHETHER OR NOT KNOWN OR ANTICIPATED, THAT OCCURS WHILE PARTICIPATING IN THE ACTIVITY AND THAT IT OBLIGATES ME TO INDEMNIFY THE UNIVERSITY, ITS TRUSTEES, OFFICERS, EMPLOYEES AND AGENTS FOR ANY LIABILITY FOR ANY INJURY, DAMAGE OR LOSSES OF ANY KIND CAUSED BY MY NEGLIGENCE OR INTENTIONAL ACT OR OMISSION WHILE PARTICIPATING IN THE ACTIVITY.

I verify that I am at least eighteen (18) years of age and fully competent to sign this Agreement.

Signature

McKaila Boarman

Name (Please print)

01/19/2016
Month Day Year
To be completed if participant is under 18 years old:

Recognizing the possibility of injury, including death, damage or loss resulting from the Activity and for the University accepting the participant for the Activity, I hereby release, discharge and/or otherwise indemnify the University, and its trustees, officers, employees and agents against any claim by or on behalf of the participant as a result of the participant’s participation in the Activity. I further warrant that I am authorized to sign the form on behalf of the participant.

**Parent/Legal Guardian Signature:** N/A
(If Participant is under 18 years old)

**Parent/Legal Guardian Printed Name:** N/A
(If Participant is under 18 years old)

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**Conditions of Participation.**

I, the undersigned, do hereby accept my participation on this trip and agree to all terms and conditions of the trip. Furthermore, I verify that I am at least eighteen (18) years of age and fully competent to sign this agreement.

1. **Personal Conduct.** I agree to participate in all aspects of the program, including pre-departure and on-site orientation, instruction, excursions, and evaluation. I understand that Ohio University and its representatives have the authority to establish rules of conduct necessary for the operation of the program during the entire period of the program. The Ohio University Student Code of Conduct also applies to me whether I am in the U.S. or abroad. Should I violate stated rules, the Ohio University Student Code of Conduct, or the laws of the state or host country or any other state or country I may visit while off-campus, demonstrate disruptive behavior, or through my conduct bring the program or its participants into disrepute or legal or physical jeopardy, I may be removed from the program and/or face other sanctions. If I am dismissed from the program, I will lose all academic credit and will remain responsible for all program costs incurred on my behalf.

2. **Insurance Coverage.** I understand that I will be enrolled in the mandatory study abroad health insurance by Ohio University for the duration of the trip. The policy provides coverage for my benefit, including health insurance, accidental death and dismemberment, repatriation of remains, and medical evacuation. I acknowledge my responsibility to understand the conditions and limitations of this coverage and agree that Ohio University is not responsible for any uninsured losses.

3. **Medical Treatment.** In the event of illness or injury to me, I authorize any official representative of Ohio University to secure medical treatment on my behalf, including surgery and the administration of an anesthetic, and I accept all financial responsibility for such treatment.

4. **Independent Travel.** I understand that neither Ohio University nor its staff is responsible for me while I am traveling independently.

5. **Permission to Share Information.** I give Ohio University and its representatives permission to communicate internally and with my parents, host institution abroad, and/or other emergency contact person (as specified in this form) regarding all issues surrounding my abroad experience. This may include but is not limited to student account information, student conduct issues, health and safety, grades or academics; such contact may occur before, during or after the trip.

6. **Photo Release.** I give Ohio University and its representatives permission to make use of photographs bearing my image in both print- and web-based program materials for educational, non-commercial promotion.

7. **General Release and Waiver.** I release Ohio University and its staff from any liability for damage or loss of property, injury, illness or death during the period of the trip, arising on the part of fellow participants, host family members, agencies and education organizations, persons, or groups with which Ohio University contracts for the provision of services for the program, or which have been suggested by program faculty as resources for regional or independent study projects.

I understand that all Ohio University Policies and Procedures are subject to change, and it is my responsibility to be informed of all University policies pertaining to students enrolled at Ohio University. I certify that all responses made on this application are complete, true and accurate, and I will notify the Office of Global Opportunities.
hereafter of all relevant changes that may occur prior to the start of the program. I hereby acknowledge that I have read, fully understood, and agree to the policies as stated above.

McKaila Boarman

Signature

01/19/2016

Month Day Year

Name (Please print)

McKaila Boarman

Parent/Legal Guardian Signature: N/A
(If Participant is under 18 years old)

Parent/Legal Guardian Printed Name: N/A
(If Participant is under 18 years old)

Ohio University does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities.
Letter of recommendation for a “Student Enhancement Award” for Kaili Boarman

I am pleased to provide my strong recommendation for Ms. Kaili Boarman in her application for a Student Enhancement Award from Ohio University. I hereby confirm that I am available to act as a local advisor at Lund University in Sweden for Kaili, so that she can realize the exciting project plans she has outlined in her proposal.

Kaili’s project builds on the foundation laid by her current graduate student advisor at Ohio University (Shawn Kuchta), who was an NSF-funded postdoc at the Biology Department in Lund between 2007 and 2009. Since then, data from slaughter stations in the forms of wings of damselflies (the banded demoiselle, Calopteryx splendens) have been collected by our field assistants as well as by Kaili during the summers 2014 and 2015. Kaili does therefore have access to a rich database of wing morphology of damselflies killed by avian predators as well as morphological data of those that survived for comparisons. These fitness data will enable her to estimate the strength and form of natural selection on wing morphology. As mating data in relation to wing morphology is also available for the same population, she will be able to quantify both natural and sexual selection within the same location and for the same traits.

To understand the interaction between natural selection and sexual selection remains a major challenge in evolutionary ecology. This damselfly system is unique, since the agent of natural selection (an avian predator) is known, while at the same time sexual selection can be quantified for the same wing morphological traits (size, shape and colouration) that are also targets of predator-mediated selection. Without doubt, the results of the proposed study will attract a lot of interest from ecologists and evolutionary biologists and her research has therefore excellent chances to subsequently become published in one or several leading international scientific journals.

Sincerely yours,

Erik Svensson
Erik.svensson@biol.lu.se

Home page: http://biology.lu.se/erik-svensson