

HUMBOLDT STATE UNIVERSITY  
**INSTITUTIONAL ANIMAL CARE AND USE PROTOCOL  
FOR THE HUMANE CARE AND USE OF LIVE VERTEBRATE ANIMALS**

**This box is for the review of the use by the Institutional Animal Care and Use Committee.  
Authors should not write or type inside the borders of the box.**

Date 1<sup>st</sup> Received: 10/24/16 Revision 1 Date: 10/31/16 Revision 2 Date: \_\_\_\_\_ No. 116/17.W.416-C

- ( ) E- Procedures are exempt from full IACUC review because they are purely observational, non-invasive, and produce no perceptible discomfort or they concern only the use of tissues from dead animals. To be considered exempt, tissues from dead animals must be obtained from animals euthanatized or otherwise killed by means, and for purposes, unrelated to the proposed project. The procedure may be approved by the Chair one additional member of the IACUC.
- ( ) A- Procedures will be minimally invasive or produce relatively little discomfort. Protocols may involve, bleeding, injections, minimal sampling, anesthesia or humane euthanasia without prior invasive manipulation. The procedure may be approved by the Chair and two additional members of the IACUC. Project topics will be reviewed by the IACUC at the next scheduled meeting.
- ( ) B- Procedures will involve prolonged manipulation or be invasive. Protocols may involve surgical or other stimuli inducing pain or distress, but all pain or distress will be mitigated with appropriate anesthetics or analgesics. The procedure may be initially approved by the Chair, the Campus Veterinarian and one additional member of the IACUC. Protocols will be reviewed by the IACUC at the next scheduled meeting.
- ( ) C- Procedures will be invasive and may cause prolonged physiological or psychological stress. Pain, considerable distress, or discomfort may be induced and not mitigated by anesthesia or adequate analgesia (e.g. LD50 experiments, long-term food or water deprivation, etc.). These protocols will be reviewed thoroughly by the IACUC prior to commencement of the project.

Requires Health Assurance ( ☒ ) Yes ( ) No

Signature, IACUC Member

Date

☒ Approved

( ) Denied

Signature, IACUC Member

Date

( ) Approved

( ) Denied

Signature, Campus Veterinarian (if necessary) Date

( ) Approved

( ) Denied

Signature, IACUC Chair

Date

☒ Approved

( ) Denied

**Final Committee Decision. All protocols must be approved prior to the start of research.**

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**INSTRUCTIONS**

Federal animal welfare regulations require that an Institutional Animal Care and Use Committee (IACUC) review and approve all activities involving the use of vertebrate animals prior to their initiation. This includes any animals used for the development of experimental methodologies, instructional purposes, research, etc. Approved protocols for ongoing and recurrent activities must be reviewed by the IACUC on an annual basis. However, extensions and amendments requiring an abbreviated application process may be granted for a total of three consecutive years. Compliance with animal welfare regulations is mandatory and is the responsibility of all individuals (including faculty and students) who choose to work with live vertebrate animals.

To avoid the proliferation of submissions, please provide generic descriptions (including multiple routes of compound administrations, minor procedural variations, similar laboratory exercises from a single course, routine exercises used in several courses, etc). When multiple vertebrate species are to be used, please clearly describe all procedures, and all variations thereof, to be used with each individual species.

Please submit your protocols to the Dean's Office, College of Natural Resources and Sciences, Forestry Bldg, Room 101. All protocols should be submitted on the most recent version of the forms downloaded from the IACUC web page (<http://www.humboldt.edu/iacuc>). You can expedite the review process by following these formatting rules: leave an extra blank line between the questions and your responses; leave questions in bold-face type; type your answers in regular (non-bold) type; and do not delete anything from the questions. Please contact the Campus Veterinarian, Dr. Rick Brown, (by phone, 826-3320, or e-mail, [RBrown@humboldt.edu](mailto:RBrown@humboldt.edu)) or the Chair of the IACUC, Dr. Rick Zechman (by phone, 826-3546, or by email [Rick.Zechman@humboldt.edu](mailto:Rick.Zechman@humboldt.edu)) with questions concerning protocol preparation and submission.

- ◆ Please allow ten working days for review of proposals to conduct minimally invasive procedures and an excess of one month for review of proposals to conduct invasive procedures; note that these time periods are minimal and assume that no revisions will be necessary prior to approval. ALWAYS verify approval (Office of the Chair of the IACUC; 826-3256) before starting your project. Authors of protocols should contact the Campus Veterinarian, the Chair of the IACUC or Violet McCrigler in the CNRS Dean's Office, if they haven't heard any news after 10 days following protocol submission.

**1. Faculty Project Leader:** Micaela Szykman Gunther

**Department Affiliation:** Wildlife

**2. Project Title:** Fecal DNA mark-recapture methods for Roosevelt Elk in northwest California

**3. Email address(es) of the Faculty Project Leader and other corresponding applicants:**

ms147@humboldt.edu

**4. Names of others handling live animals in the absence of, or not directly supervised by, the faculty project leader, and their qualifications to perform the procedures indicated. (Do not list students in a class here - see 8 below):**

There will be no handling of live animals. Others that will be involved in the scat collection procedures include: Dr. Tim Bean: faculty in Dept of Wildlife. Extensive experiencing surveying mammals in various habitats; skilled in geospatial techniques. Dr. Rick Brown: faculty in Dept of Wildlife and Campus veterinarian. Extensive experience working with mammals in wild environments in various capacities from surveys to chemical immobilization. Carrington Knox: elk biologist for CDFW. Extensive experience working with free-ranging mammals, from surveys to chemical immobilization. Rudy Mena, graduate student, Department of Wildlife, strong field experience with ungulates. Emily Buck, graduate student, Department of Wildlife, extensive experience with wildlife field studies. Erin Nigon, graduate student, Department of Wildlife, strong field experience with ungulates. Also, we will be adding 1-2 as of yet unidentified graduate students and maybe a couple of supervised undergraduates, to be determined.

**5. Will the described project be funded?** ☒ Yes ☐ No

**If funded, will the funds be administered by the HSU Sponsored Programs Foundation (SPF)?**

☒ Yes ☐ No

**If funded, but not administered by the HSU SPF, then list the unit that will administer the funds:**

Click or tap here to enter text.

**6. Proposed starting date (the starting date cannot precede date of approval, and all protocols must be renewed or extended annually).** The Annual Protocol Review Form must be approved on or before the anniversary of the approval date to indicate termination of the project or to request extension of the dates of approval.

Upon approval, but scat collection will probably start in December 2016 or January 2017.

**7. Provide a brief, non-technical, description of the project. Your response should include the proposed goals, general methods, and educational or scientific objectives that the proposed use is designed to meet.**

The main objective of this work is to collaborate with CDFW on increasing the efficiency of

methods used to determine population numbers of Roosevelt elk (*Cervus elaphus roosevelti*) in northwestern California. Towards this objective, our main goal is to collect scat from herds to conduct capture-recapture estimates using fecal DNA, then compare to visual surveys of collared herds

8. Is the primary purpose of the project for ☐ instruction, ☒ research, or ☐ both?

Based on your answer, please address the relevant questions below.

**If the primary purpose is for instruction**, list the course number and write the CRN for this semester (note that this CRN will need to be updated with any future offering of the course covered by this protocol).

**Course # (e.g. ZOOL 356):** Click or tap here to enter text.

**CRN:** Click or tap here to enter text.

**Will all of the enrolled students in the course denoted by the CRN above participate in the use of animals covered by this protocol?** ☐ Yes ☐ No

**If no, then provide a list of the students exposed to, or otherwise using, live vertebrate animals.**

Click or tap here to enter text.

**Describe the learning objectives that merit using live animals for the purposes of instruction.**

Click or tap here to enter text.

**If the primary purpose is for research**, explain how you determined that this protocol does not unnecessarily duplicate previously published observations or experiments; please include:

1. **the type of literature searches conducted:**  
Wildlife worldwide, BioOne
2. **keywords used:**  
elk, scat, fecal DNA, population estimate
3. **range of dates searched:**  
all
4. **other resources used:**  
Conversation with colleagues working on similar questions

9. Will any of the animals described in this protocol be housed in an animal facility? ☐ Yes ☒ No  
If yes, check the appropriate facility below:

- ☐ Biological Sciences Animal Rooms
- ☐ Fish Hatchery
- ☐ Samoa Aquaponics
- ☐ Telonicher Marine Lab

- ☐ **Wildlife Pens**  
☐ **Zebra Fish Development Lab**  
☐ **Other. Please list:** Click or tap here to enter text.

10. **Scientific name, common name, and characteristics of all species to be used. List species separately to explain variation in use. Please also list the total numbers of animals to be used or substantially affected by this project.**

**For field studies, please list all target species and note their status (not protected = NP; protected, including species of special concern or candidate species = P; considered by the state or federal government to be threatened = T, considered by the state or federal government to be endangered = E); also list non-target species that are likely to be impacted. List the range of numbers of individuals to be used for each species.**

**TARGET SPECIES - please attach additional pages if needed**

Latin Binomial(s)	Common name(s)	Sex	Age or Wt Range	Status	Numbers
<i>Cervus elaphus roosevelti</i>	Roosevelt Elk	Unspecified	all	NP	800
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.	Select One	Click or tap here to enter text.

**NON-TARGET SPECIES – please attach additional pages if needed**

Latin Binomial(s)	Common name(s)	Status	Numbers
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Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Select One	Click or tap here to enter text.

- 11. Explain why a smaller number would not allow you to meet your objectives (please provide justification based on statistical or other logical reasoning). If this is a field project, and you cannot predict the exact number of animals to be sampled, please give your best estimate and an explanation of the variables that will determine your sample size N/A is an inappropriate response unless the protocol covers only the transportation, use, and/or storage of carcasses or tissues.**

We anticipate visually surveying up to 800 elk (observation only) in Humboldt and Del Norte Counties, collecting scat from these animals and analyzing scat to identify individuals. We aim to establish a reasonable protocol for CDFW to adopt to help them determine how many elk there are in these counties.

- 12. Source of the animals (or tissues) to be used for captive studies or the location of study area(s) for field studies. For transportation, storage, and use of tissues from carcasses, explain the circumstances of death. If this information is unknown, provide the name and contact information for the person or company from which the samples are to be obtained.**

All elk will be free-ranging in the wild and will remain in the wild in Humboldt and Del Norte Counties.

- 13. Will live vertebrate animals be maintained in captivity for greater than 12 hours? ☐ Yes ☒ No**

**If yes, describe where and how the animals will be housed (include all relevant husbandry details):**

Click or tap here to enter text.

**Who will be responsible for their daily care?**

Click or tap here to enter text.

- 14. List the specific procedures likely to affect the behavior, physiology or wellbeing of live animals.**

None of these procedures should cause distress to the elk. We will wait until the elk have moved

off before collecting scat in the area they were bedded or foraging. Also, these elk are generally habituated to human presence, so just observing them should cause no discomfort or distress

**15. Mark the level of expected pain or distress caused by your methods below.**

- ☒ The methods described are purely observational and non-invasive OR will involve only the tissues or carcasses of dead animals; behavior of live animals will not be influenced intentionally.
- ☐ The methods will affect behavior, but no animals will be captured or handled (e.g. baiting animals, cameras in close proximity to animals, production of noises within normal limits of volume and frequency)
- ☐ The methods involve capture or handling without anesthesia, but only for a brief period for measurement or observation. No samples will be collected.
- ☐ The methods involve capture or handling without anesthesia, and routine samples (hair, blood, etc.) will be collected or euthanasia will be performed; this may involve use of routine pharmaceuticals to promote health (e.g. antibiotics, vitamins, fluids). This work may also involve temporary marking, placement of permanent tags, or fitting with telemetry transmitters or GPS receivers.
- ☐ The methods require use of anesthesia to mitigate distress or facilitate handling, and routine samples (hair, blood, etc.) will be collected or euthanasia will be performed. As above, this work may involve temporary marking, placement of permanent tags, or fitting with telemetry transmitters or GPS receivers.
- ☐ The methods require use of anesthesia to mitigate pain or distress, and procedures will be invasive enough to require pain killing drugs (analgesics) upon revival. Sampling and marking may be performed as above.
- ☐ The methods will cause pain or considerable distress, but analgesics will not be used to mitigate the pain (e.g. surgeries from which animals are revived without provision of analgesics).
- ☐ The methods will be invasive and cause prolonged physiological or psychological stress without adequate mitigation of pain or distress. This may involve allowing animals to progress to death without provision of euthanasia or analgesia (e.g. LD50 experiments or long-term food or water deprivation).

**16. Provide a complete and detailed description of all procedures to be performed involving live vertebrate animals. This response should justify comments made in # 13-15 and provide a detailed explanation of all procedures that affect animal behavior, physiology or wellbeing. Your response must address the handling and restraint of animals; deprivation of food or water; use of chemicals or biological agents; sampling methods for removal of biological samples; surgical and post-surgical procedures. N/A is an inappropriate response unless the protocol covers only the transportation, use, and/or storage of carcasses or tissues.**

We will visually survey regions for elk herds, counting all elk we see in an area. We will collect scat of those elk and other elk where we may find scat. We will conduct linear transects and compare these methods to placement of grids over areas where elk have foraged or bedded to compare output of DNA extraction and identity of individuals using different scat survey methods.

We will survey elk 3-5 times per week starting in January, 2017, and continuing throughout 2017 and beyond (with annual approval of protocol). Surveys will consist of finding elk by driving specified routes. Elk groups will be observed for several minutes (5-60 min) to establish herd composition and behavior. After elk have moved from the area, a line or grid transect will be established to collect scat samples from the area. Observers will wait until animals are at least 100-200m away from the survey area before exiting the vehicle to collect scat. Vehicles will not be parked on the sides of roadways for safety. Four to six pellets from each of 10-100 scat piles will be collected in centrifuge tubes for storage until time to extract DNA. We plan to conduct extractions and PCR in the CNRS Core Facility.

- 17. Use of animals for teaching or research requires consideration of alternative procedures to reduce the number of animals used and to decrease the pain and suffering caused by animal use. Describe alternative procedures that were considered and rejected as well as a brief explanation of why the alternative procedures were rejected. N/A is an inappropriate response unless the protocol covers only the transportation, use, and/or storage of carcasses or tissues.**

We considered using blood samples for individual identity, but we would have to capture and immobilize too many animals, and this procedure would be highly invasive. We considered using cameras, and we may use these as a complementary method. There is currently another study underway looking at success of cameras (with IACUC approval).

- 18. Identify serious human health risks (non-routine exposures to risk, disease agents, toxic chemicals, dangerous environmental conditions, etc., ) to which any participants might be exposed during the routine performance of the duties proposed herein.**

We anticipate little human health risk with these procedures. Scat may contain unpleasant parasites and so collectors will use gloves to collect scat pellets and wash hands carefully after handling all collection vials. Elk may be aggressive to observers at certain times of year (rut and calving).

**Describe steps taken to mitigate risks.**

Collectors will use gloves to collect scat pellets and wash hands carefully after handling all collection vials. Elk will not be approached to within 100m to avoid upsetting rutting males or calving females.

- 19. Describe the fate of the animals upon completion of the protocol. Include (1) the procedure for euthanasia whether necessary as an experimental termination or in the case of unanticipated, accidental, injury whenever animals will be confined or handled and (2) the method of verification of death. Chemical euthanasia methods must include an appropriate, pharmaceutical-grade, drug, the route, and the dose to be used. Applicants should review the current Guidelines for Euthanasia (or its replacement in the Code of Federal Regulations), and justify any variations from the approved methods. Note that the Responsible Faculty Member must report unexpected deaths to the IACUC immediately and that N/A is an inappropriate response unless the protocol covers only the transportation, use, and/or storage of carcasses or tissues.**

No animals will be handled with this protocol. If an injured elk should be observed, we will call our colleagues at CDFW to handle the injured animal. Main contact is Carrington Knox, listed on this protocol.

- 20. I certify that the above information is accurate and complete, that I have read and agree to abide by the "Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research,**

and Training at HSU," that I will make copies of these principles and other pertinent guidelines available to those persons who work under my supervision, and that deviations from this protocol, including any unanticipated injuries or death of animals, will be reported *immediately* to the IACUC. Further, my level of supervision will be such that these procedures will be carried out in a humane and a scientifically acceptable manner as described herein. I understand that, as the research supervisor, I take responsibility for the conduct of anyone working under this approved protocol, and I will supervise the research to ensure that no work is conducted that is not covered herein or in a separate approved protocol. I am aware that my research might require permits from federal and/or state agencies that regulate the harassment, capture, transport, captive maintenance, handling and manipulation of live vertebrate animals, and I have marked all boxes pertaining to the relevant laws (and state permits) governing the species used in my research. I certify that my research will be conducted in accordance with all relevant federal and state laws.

I am aware that the following Acts apply to my study (check all that may apply):

- ☐ Animal Welfare Act
- ☐ State of California Fish and Game Commission (Title 14) - Scientific Collecting Permit(s)
- ☐ Endangered Species Act
- ☐ Fishery Conservation and Management Act
- ☐ Lacey Act
- ☐ Marine Mammal Protection Act
- ☐ Convention on International Trade in Endangered Species of Wild Fauna and Flora
- ☐ **Other: please list** Click or tap here to enter text.

  
Signature, Responsible Faculty Member

10/24/2016  
Date

Gunderson

Routing Slip for IACUC Protocol Reviews

Please keep this routing slip with the IACUC protocol you are reviewing. Please note, per our PHS Assurance, that reviews take place simultaneously on the same version of the protocol. Reviewers should communicate via phone or email to discuss any changes or concerns with the protocol.

Protocol No. 10 / 17. W. 46. E

Reviewer	Approve	Disapprove (Attach comments)	Date
Galtan	✓		11/1
(pt)			

1st Review	
2nd Review	
3rd Review	
4th Review	



Violet McCrigler &lt;vnm3@humboldt.edu&gt;

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**IACUC: New Protocol Arrival - Oct 31**

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**Rick Zechman** <rick.zechman@humboldt.edu>  
To: IACUC HSU <iacuc-hsu@humboldt.edu>

Tue, Nov 1, 2016 at 3:27 PM

The following protocols have just arrived in the office. If you would like to review one or more but have not been asked to do so, please contact Violet (x3256) and she will see that you get a copy.

**Title:** Fecal DNA mark-recapture methods for Roosevelt Elk in northwest California

**No:** 16/17.W.46-

**PI:** Micaela Gunther

**Grant Funded:** Yes

**Summary:** Visual surveys of elk, scat collection and analysis.

**Title:** Presence of domestic cats (*Felis catus*) in forest refuges

**No:** 16/17.W.47-

**PI:** Katherina Gieder

**Grant Funded:** No

**Summary:** Baited trackplates will be used to determine presence or absence of cats in forest locations.

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Violet McCrigler  
Administrative Support Coordinator  
College of Natural Resources and Sciences  
IACUC Support Staff | <http://www.humboldt.edu/iacuc>  
Humboldt State University  
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