

revised

AUG 22 2016

College of Natural Resources & Sciences
Humboldt State University

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 1st Received: 8/10/16 Revision 1 Date: 8/24/16 Revision 2 Date: _____ No. 16/17.W.08-A

- () 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

Maria S. Smith
Signature, IACUC Member

8/23/2016
Date

☒ Approved

() Denied

[Signature]
Signature, IACUC Member

9/6/16
Date

☒ Approved

() Denied

Signature, Campus Veterinarian (if necessary) Date

() Approved

() Denied

[Signature]
Signature, IACUC Chair

9-7-16
~~8-23-16~~
Date

☒ Approved

() Denied

*Signed prematurely
(work not started)*

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

1. Faculty Project Leader: Barbara Clucas

Department Affiliation: Wildlife

2. Project Title: Terrestrial Species Stressor Monitoring

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

Barbara.clucas@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):

We will be hiring 16 employees – at this time their names are not known. Those hired will have experience in wildlife surveys and will go through a 4 week training process to prepare for field work conducted on this project. They will also complete CITI IACUC training and will be registered with the protocol through an IACUC amendment.

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.

1 March 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 state of California has been experiencing a drought for approximately the past 5 years. The California Department of Fish and Wildlife (hereafter CDFW) has been charged by the drought State of Emergency, which was declared by a Governor's executive order in 2014, to implement projects that address the potential effects of the drought on wildlife and their habitats. To this end, CDFW is entering into a contract with Humboldt State University to implement this project to monitor wildlife populations and their susceptibilities to drought stressors. Objectives of this project are to estimate abundances of common birds, mammals, reptiles and amphibians across several ecoregions in California and conduct preliminary analyses on the relationships among wildlife abundances and habitat conditions (including drought). Key survey methods will include automated sound recorders to detect bird species and some

mammal species (e.g., bats and coyotes) and amphibian surveys (e.g., frogs), trail cameras to detect mammal species, visual encounter surveys to detect mammal, bird, reptile and amphibian species, and rapid habitat assessment surveys.

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:
BIOSIS Previews and Google Scholar
2. keywords used:
Drought, California, Monitoring, Wildlife, Mammals, Birds, Reptiles, Amphibians
3. range of dates searched:
1969-2016 (BIOSIS Previews) "any time" (Google Scholar)
4. other resources used:
Click or tap here to enter text.

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>Canis latrans</i>	Coyote	Unspecified	Click or tap here to enter text.	NP	1200
<i>Urocyon cinereoargenteus</i>	Gray Fox	Unspecified	Click or tap here to enter text.	NP	1200
<i>Lynx rufus</i>	Bobcat	Unspecified	Click or tap here to enter text.	NP	1200
<i>Odocoileus hemionus</i>	Black-tailed Deer	Unspecified	Click or tap here to enter text.	NP	1200
<i>Spermophilus sp.</i>	Ground squirrel species	Unspecified	Click or tap here to enter text.	NP	1200
<i>Eptesicus fuscus</i>	Big Brown Bat	Unspecified	Click or tap here to enter text.	NP	1200

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 will be surveying approximately 400 sites for any species of mammals, birds, reptiles and amphibians and using 4 different survey techniques (automated recording, trail cameras, visual encounter transect and visual encounter quadrats). For automated recording surveys, they will be in place for approximately 5 days at each site and we estimate approximately 25 birds, 25 frogs and 10 mammals to be recorded. Thus across all sites we estimate 10,000 birds, 10,000 frogs and 4,000 mammals to be recorded (this is likely an overestimate). For trail camera surveys, they will be in place for approximately 28 days at each site and we estimate approximately 60 mammal photos will be recorded at each site. Thus across all sites we estimate 24,000 mammals will be photographed. For visual encounter transect surveys, we estimate about 2 mammals and 5 birds to be observed per transect, for an estimated total of 800 mammals and 2,000 birds observed. For visual encounter quadrants, we estimate approximately 5 reptiles and amphibians will be recorded per quadrat, for an estimated total of 2,000 reptiles and amphibians. Due to the expansive nature of this project (monitoring effects of drought on mammals, birds, reptiles and amphibians across most of California) the number of sites is necessary to capture a variety of sites and areas affected differently by drought to be able to make predictions for a large number of species and habitat types. NOTE that we are interested in all species of mammals, birds, reptiles and amphibians, so any of these vertebrate species recorded will be considered a target species. Our total estimate for all taxa would be 54,8000 records (photographs, visual encounters, etc), which is likely an overestimate. In question number 10, we provide the more common species we are likely to encounter and an estimate of how many individuals will be recorded across 400 sites. We estimate at most 3 individuals per site for a total of 1200 individuals. These are also likely over estimates. There will likely be other species, but they are too numerous to list.

- 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.**

Surveys will be conducted throughout California's Great Valley and Mojave Desert at approximately 400 study sites. Permission from landowners/managers will be obtained prior to conducting any surveys as well as any necessary permits.

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.

Automated Recorder Surveys: Wildlife Acoustics SM3 recorders will be placed at sites – these recorders are not expected to greatly affect the wellbeing of live animals but may cause some species (mammals in particular) to have a neophobic response, however we believe these responses to be minimal and not greatly affect their behavior. Trail Camera Surveys: Trail cameras will be placed at sites along with bait – bait will likely attract mammals (and perhaps birds) to the site and therefore might increase likelihood of competition among conspecifics and/or heterospecifics, however such encounters are expected in nature and we believe the wellbeing of the live animals will not be greatly affected as animals are not trapped and will be likely free to leave the area if a negative interaction is taking place. Visual Encounter Transect Surveys: Observers will walk along two 200-meter transects and record wildlife seen – observers will not approach wildlife but their presence could startle animals and cause them to leave the area, however we believe these effects to be minimal on the animals' wellbeing. Visual Encounter Quadrat Surveys: for a subset of sites, these surveys will be conducted by using a time-constrained search for 1 hour in a 1 ha quadrant and all surface active reptiles and amphibians will be recorded – these surveys may momentarily disturb wildlife in the area but effects on the wellbeing of the animals are expected to be minimal.

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.

Please see attached

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 trapping and marking animals to estimate abundances of mammals and birds, however these methods are more invasive and time-consuming. Due to the large geographic scale of this project, the funding and time needed for these more invasive methods are prohibitive and thus we rejected using these methods. Moreover, the methods we are using are the least invasive that can give good estimates of wildlife and be done within a 6-month field period.

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.

Employees will not be handling any wildlife, and we do not expect any non-routine exposures to risk other than those associated with driving off-road and to remote study sites. During the visual encounter transect surveys, employees will collect deer fecal pellets which could expose them to bacteria.

Describe steps taken to mitigate risks.

Employees will undergo 4 weeks of training and during this time field safety will be covered. All surveys will be done by at least 2 employees thus avoiding any surveying alone. When collecting deer fecal pellets, employees will avoid making any contact with the pellets (e.g., will use a stick to scoop pellets into an envelope) and will wash their hands afterwards and/or use anti-bacterial solution.

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.

Our survey methods are such that we do not expect any injury or death to occur in wildlife being recorded. However, in the unlikely event that an animal is found injured, our protocol will depend on what landtype (federally owned land, California state owned land or privately owned land) the animal is found. If on federally-owned land, the local point of contact (e.g., refuge manager or biologist) will be notified. If on state-owned land, the California Department of Fish and Wildlife 'Wildlife Investigations Lab' (<http://www.wildlife.ca.gov/Conservation/Laboratories/Wildlife-Investigations>) will be contacted. If on privately owned land, the owner will be notified and the Wildlife Investigations Lab will be notified if needed.

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

8/22/2016
Date

Additional Target Species

Latin Binomials	Common name	Sex	Age or Wt Range	Status	Numbers
<i>Aphelocoma californica</i>	Western Scrub Jay	Unspecified	All	NP	1200
<i>Corvus corax</i>	Common Raven	Unspecified	All	NP	1200
<i>Corvus brachyrhynchos</i>	American Crow	Unspecified	All	NP	1200
<i>Haemorhous mexicanus</i>	House finch	Unspecified	All	NP	1200
<i>Poecile atricapillus</i>	Black-capped chickadee	Unspecified	All	NP	1200
<i>Zonotrichia leucophrys</i>	White-crowned sparrow	Unspecified	All	NP	1200
<i>Thamnophis sp</i>	Garter snake species	Unspecified	All	NP	1200
<i>Sceloporus sp</i>	Fence lizard species	Unspecified	All	NP	1200
<i>Anaxyrus boreas</i>	Western Toad	Unspecified	All	NP	1200
<i>Pituophis catenifer</i>	Gopher Snake	Unspecified	All	NP	1200
<i>Pseudacris regilla</i>	Northern Pacific Tree Frog	Unspecified	All	NP	1200
<i>Lithobates catesbeianus</i>	American Bullfrog	Unspecified	All	NP	1200

Study Sites and Surveys

The study areas are the USDA-defined Great Valley (GV) and Mojave Desert (MD) ecoregions truncated to California state boundaries. We aim to have a total of 400 sites. Survey activities (see below) will be scheduled over a sequence of 3 visits to each site.

AUTOMATED RECORDER SURVEY

A Wildlife Acoustics SM3 recorder will be attached and cable-locked to the T-post using a U-bolt assembly. The SM3 ultrasonic channel is used to survey bats. Coyotes and owls are surveyed on the acoustic channel at night. Birds are surveyed on the acoustic channel in the morning. Amphibians are surveyed on the acoustic channel at night and in the morning. Animals are not likely to be disturbed by this setup and the survey crew is unlikely to greatly disturb animals. They will just be at the site briefly to check the device and install fresh SD memory cards, check battery levels, and activate the SM3. The survey equipment will be collected at least 5 days after set-up.

CAMERA TRAP SURVEY

A Reconyx PC900 camera will be attached and cable-locked to the T-post using a U-bolt assembly. Using shims, the camera is aimed at a shallow angle to a point on the ground 3-4 meters away from where bait items will be placed. Bait will be a 1-kg salt lick, 500 ml of oatmeal-peanut butter mixture, or 150 g of fishy cat food placed on the ground near the center of the camera's field of view. Across sites an equal proportion will be of each bait type. These baits were selected to attract deer, small mammals and carnivores respectively. Extreme care will be taken such that no odors are transferred to the camera and T-post. Single use plastic gloves will be used, different crew members handle camera versus bait tasks, and de-ionized water is used to remove scents from the camera. Bait and camera items are always stored and transported separately. The camera trap will be retrieved after at least 28 days.

VISUAL ENCOUNTER TRANSECT SURVEY

At the start of every visit to the 400 sites the crew conducts a visual encounter survey of reptiles, birds, and other vertebrate wildlife taxa. They walk two 200-m transects and record counts and distances to all wildlife observed. They use a laser range finder to accurately measure the perpendicular distance from the transect to the location of each wildlife group at the instance of its initial observation. The crew also makes note of all wildlife signs (tracks, scat, burrows, nests) observed from the transect. In particular, every scat group within a 1-m swath either side of the transect is noted and identified by species. All scats and tracks are removed from this swath so that return visits encounter fresh sign. These survey methods are likely to only momentarily affect animals behavior (e.g., they might run away) being recorded and no animals will be handled. The survey is constrained to < 1 hour.

Crews will also collect samples of all fresh deer scat encountered by scooping 4-6 pellets (or for very small pellets try to equal mass of 4 normal pellets) into a coin envelope without touching them using a stick.

VISUAL ENCOUNTER QUADRAT SURVEY

At a subset of survey sites, a quadrat survey is substituted for one of the visual encounter transects surveys. A time-constrained search of 1 hour is conducted within a 1 ha quadrat. A single observer systematically surveys by visually searching for any surface-active reptiles or amphibians while also checking under cover objects, crevices and within burrows using a hand mirror. As with the transect survey, all wildlife sign (tracks, scat, burrows, nests) are noted. These survey methods are likely to only momentarily affect animals being recorded and no animals will be handled.

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. 14 / 17 . W . 08 - A

Reviewer	Approve	Disapprove (Attach comments)	Date
<u>Gantler</u> (pt)	✓		
<u>Gantler</u>	✓		

1st Review 8/12/16 gcm
2nd Review 8/22/16 gcm
3rd Review _____
4th Review _____



Violet McCrigler <vnm3@humboldt.edu>

IACUC New Protocol Arrival

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

Thu, Aug 11, 2016 at 10:02 PM

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

Title: Terrestrial Species Stressor Monitoring

No: 16/17.W.08-

PI: Barbara Clucas

Grant Funded: Yes

Summary: Survey methods include automated sound recordings, trail cameras, visual encounter surveys, and habitat assessment surveys.

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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
(707) 826-3256