Putah Creek Riparian Reserve

MONTH AND YEAR: March 2021

UNIVERSITY OF CALIFORNIA, DAVIS

RESEARCH USE APPLICATION

Please check the part of the Reserve you wish to visit. Please call in advance to check for availability, then fill out one application per researcher, per area of the Reserve.

☐ Main Campus/South Fork Putah Creek
☐ North Fork Cutoff (Old channel of Putah Creek)
☒ Russell Ranch
☒ Experimental Ecosystem

Please email completed application to: Andrew Fulks, Putah Creek Riparian Reserve
Email: amfulks@ucdavis.edu
Prior to each visit to the Reserve, send a text message to the Reserve Steward, JP Marie, at 530-304-3251 to let him know you will be on site, or email jpmarie@ucdavis.edu.

1. APPLICANT INFORMATION:

APPLICANT: Katherine Lauck

APPLICANT'S TITLE OR ACADEMIC STATUS: PhD student

ADVISOR (If applicable): Daniel Karp

INSTITUTION (Do not abbreviate): University of California, Davis

DEPARTMENT (Do not abbreviate): Department of Wildlife, Fish, and Conservation Biology

OFFICE ADDRESS: 1072 Academic Surge

CITY/STATE/ZIP: Davis, CA 95616 OFFICE PHONE:

OFFICE FAX: EMAIL:

2. PROJECT DURATION DATES (Month/year to month/year): March 2021 through July 2023

3. REQUESTED ARRIVAL AND DEPARTURE DATES

March 2022 – August 2022

4. FULL PROJECT/THESIS TITLE (Do not truncate):

The conservation and food-safety impacts of birds in working landscapes

IF FOR DEGREE: ☐ BS/BA ☐ MS/MA ☒ Ph.D. Advisor's Name: Daniel Karp

5. INTRODUCTION OF NON-NATIVE GENOTYPES

Does your project involve the transfer of animals, plants, and/or microorganisms from outside the Reserve to within the Reserve, or between different parts of the Reserve? ☐ Yes ☒ No

6. STATEMENT OF PROPOSED RESEARCH PROJECT.

The fate of biodiversity in the Anthropocene will largely depend on the ability of species to survive alongside us in landscape mosaics of farms and patches of natural habitat. While recent work suggests that large concentrations of wildlife are often found in farming landscapes, at least two major barriers exist to their continued persistence. First, because farms often lack tree canopies that shade the understory, increasingly common temperature spikes associated with climate change may make many agricultural systems inhospitable in the future. Second, fear that wildlife carry foodborne diseases (*e.g.*, pathogenic *E. coli*) has created great pressure on farmers to discourage wildlife from visiting their farm fields. We propose using wild birds in the California Central Valley as a model system to (1) quantify and compare the impacts on temperature spikes on bird health and reproduction between farms, grasslands, and forests and (2) develop a holistic assessment of the potential food-safety risks of wild birds.

Objectives

1. Unravel the mechanisms through which climate change may affect the ability of birds to survive in human-dominated habitats.
2. Determine pathogen prevalence and pathogen survival in bird feces to understand the risks associated with birds on produce farms.

Methods

Study group 1: Nestlings will be hand-captured from nest boxes at weekly intervals after hatching, until 1-2 weeks before fledging. We will record the mass, tarsus length, bill length, and wing chord of each individual. During the last measurement, nestlings will be banded with a metal leg band and a small blood sample will be acquired via puncture of the medial metatarsal vein with a sterile needle and collection into a sterile hematocrit tube (approximately 50 microliters and/or <1% of the individual's body mass).

Study group 2: Adult birds will be captured to obtain fecal samples for pathogen testing either via hand captures from nest boxes (for cavity-nesting birds) or mist nets (for all other species). After capture, birds will be placed in sterile cotton bags where they defecate >75% of the time. Birds will then be identified, banded, and measured (*i.e.*, mass, tarsus length, bill length, and wing chord) before being released.

Study group 3: Birds will be captured to obtain fecal samples for the pathogen survival experiment either via hand captures from nest boxes (for cavity-nesting birds), following larger birds and waiting for them to defecate (*e.g.*, Wild Turkeys and Canada Goose), or mist nets (for all other species). After extraction from mist-nets (see methods below), birds will be placed in sterile cotton bags where they defecate >75% of the time. Birds will then be identified and released.

PCRR's role

We request permission to continue monitoring the 10 nest boxes in the Experimental Ecosystem as described above (see attached map). We plan to visit once weekly to collect (1) nestling morphometrics, (2) nestling and adult blood samples, and (3) adult fecal samples. We also request permission to capture birds using mist nets at the Russell Ranch PCRR site. We will coordinate with the UC Davis Museum of Fish and Wildlife Biology to ensure that we do not disturb research activities in that location.

7. CONTRACT/GRANT INFORMATION (Please check all that apply to your project.)

☐ PROJECT IS SELF-FUNDED.

☒ PROJECT IS CURRENTLY BEING SUPPORTED BY A CONTRACT(S) OR GRANT(S)

☒ A CONTRACT(S) OR GRANT(S) APPLICATION HAS BEEN SUBMITTED BUT HAS NOT YET BEEN APPROVED.

☐ A CONTRACT(S) OR GRANT(S) APPLICATION WILL BE SUBMITTED IN THE FUTURE.

PLEASE LIST THE ESTIMATED PERCENTAGE OF THIS GRANT THAT WILL GO TOWARD YOUR RESEARCH DONE AT THE RESERVE:_____20%_____

If this project is currently being supported by a contract(s) or grant(s), please complete the following for each award received (attach additional sheets, if needed). If you receive funding for your project in the future, please update the Reserve manager.

PRINCIPAL INVESTIGATOR: Daniel Karp

PI'S AFFILIATION (Do not abbreviate): University of California, Davis

SPONSOR (Do not abbreviate): Horodas Research Award

AWARD AMOUNT: $5,000 DATE AWARD GRANTED: March 2021

PROJECT DURATION DATES (Month/year to month/year): March 2022 to July 2022

GRANT NUMBER: N/A

FULL PROJECT TITLE (Do not truncate): Mechanisms underlying the interactive effect of temperature spikes and habitat conversion on nesting birds

8. PERMIT REQUIREMENTS

Please read and answer the following items carefully. Researchers will not be allowed access to the Reserve until they obtain the appropriate permit(s), or the Reserve has been informed by the agency(ies) involved that no permits are required for the project described in this application. It is the user's responsibility to obtain the appropriate permit(s) and to provide the Reserve manager with a copy. Please discuss permit requirements with the Reserve manager.

A) Does your project involve vertebrate animals? ☒ Yes ☐ No

If "Yes,"
- Indicate all that apply: ☐ Reptile ☐ Amphibian ☐ Fish ☒ Bird ☐ Mammal
- Will any animal be captured? ☒ Yes ☐ No
- Will any animal be held longer than 12 hours? ☐ Yes ☒ No
- Will any animal be held longer than 24 hours? ☐ Yes ☒ No
- Will any birds be banded and/or color marked? ☒ Yes ☐ No
- Will any animal's skin be broken (needles, tags, surgery, etc.)? ☒ Yes ☐ No
- Will any animal's movement in the environment be restricted? ☐ Yes ☒ No
- Is there potential for any animal's behavior to be altered? ☐ Yes ☒ No
- If this is a renewal, has there been any change in the project? ☒ Yes ☐ No ☐N/A

Prior to beginning a research project involving the capture, marking, or physical contact with of vertebrate animals, you must receive approval from the animal care committee at your home

institution. (This is often the same committee that oversees the care of laboratory animals.) Please append written approval to this application.
Please see attached approval.

B) Does your project involve the collecting (including banding and/or color marking) of vertebrate wild animals or invertebrates? ☒ Yes ☐ No
If "Yes," you will need to obtain a scientific collecting permit from the California Department of Fish and Game. Please append permit. A permit is not required to collect freshwater plants.
Please see attached permit.
Does your project involve the collection, banding, and/or color marking of birds? ☒ Yes ☐ No
If "Yes," you will need a federal permit from the U.S. Fish and Wildlife Service. Please append permit.
Please see attached permit.
Does your project involve working with plants or animals that are California state listed species of special concern, threatened, or endangered species? ☐ Yes ☒ No
If "Yes," you will need to obtain a memorandum of understanding (MOU) from the California Department of Fish and Game. Please append permit.

Does your project involve taking plants or animals that are Federally listed threatened or endangered species? ☐ Yes ☒ No
If "Yes," you need to obtain a federal permit from the U.S. Fish and Wildlife Service. Please append permit.
PERMITS CAN TAKE AT LEAST 30-60 DAYS TO BE APPROVED, SO CALL IMMEDIATELY FOR AN APPLICATION.

9. IN CASE OF EMERGENCY:

Contact: Sequoia Williams Phone: 5107780755

10. PUTAH CREEK RESERVE REGULATIONS

• If the research application is approved, the user must comply with all applicable University regulations, including those that are Reserve-specific, and provide all required state and federal permits.

• All publications resulting from the use of the Putah Creek Reserve must acknowledge the University of California and the Putah Creek Reserve. Please submit two copies of all publications (only one bound copy of a thesis or dissertation is required) to the Reserve manager.

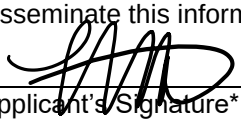
• All researchers must provide on an annual basis, at a minimum, a text file that describes each data set derived from their work on the Reserve and a summary of research results. Minimum required metadata includes the title of each data set, the investigator's name, mailing address, e-mail address, and an abstract. All researchers are strongly encouraged to provide copies of mature data sets derived from work on the Reserve, which will be archived at the Reserve.

• Material(s), including resulting fragments, subunits, progeny, products, genetic material, mutants and derivatives, approved for collection by the Putah Creek Reserve belongs to the University of California. You and your institution/company will use the material(s) only in that scientific research activity described in this application and will not allow the material(s) to be transferred to any other party or use them for commercial purposes without the express written consent of the University of California.

• Visitors may not bring animals (domestic or wild) to the Reserve, unless they are part of an approved research project or are necessary to help a disabled user. Please notify the Reserve manager if you have a special need.

- Firearms are forbidden at the Reserve, unless the University has granted special permission.
- All users are requested to leave the land and any facilities cleaner than you found them.

I have read and agree to abide by the Putah Creek Reserve use regulations listed above and any Reserve-specific rules appended to this application, and am aware that it is my responsibility to disseminate this information to all members of my party.



Applicant's Signature* | 1 March 2022 Date

Reserve Manager's Approval | Date

* Receipt of application via email is comparable to applicant's signature.