

2022 COOPERATIVE SUMMER FELLOWSHIP PROGRAM – PROJECT PROPOSAL

APPLICANT TYPE: ESA;

PROJECT TITLE: EFFECTS OF LANDSCAPE CONNECTIVITY ON NATIVE BEE NESTING BEHAVIOR

Ralph Grundel,

Discipline: Ecology;Wildlife Biology;Modeling;

PROJECT DESCRIPTION

BACKGROUND

There is increasing evidence globally of declines in the abundance and distribution of pollinators, especially native bees. The USGS is working on many fronts to understand and reverse those declines. At the USGS Great Lakes Science Center, Lake Michigan Ecological Research Station, Chesterton, Indiana, located at Indiana Dunes National Park, we are helping to create a conservation plan for the native bees of the Great Lakes Basin. As part of that effort, we are undertaking research on how habitat and landscape affects the abundance and distribution of those bees. A key feature of that research is our attempt to understand how landscape connectivity – how continuous suitable habitat for bees is across the landscape – affects the propensity of cavity nesting bees to nest at different locations across Indiana Dunes National Park.

INTERN TASKS

The intern will have the opportunity to participate in field experiments that examine how habitat features, including landscape connectivity, affect where different bee species choose to nest. The intern will also have opportunities to learn data analysis skills, especially analysis of spatial data using geographic information system software. Additionally, the intern may participate in studies developing environmental DNA (eDNA) as a tool for identifying how bees use different plant species for pollen and nectar collection. The project will include field work at one or more Great Lakes national parks. Intern may have an opportunity to participate in other projects related to threatened and endangered species of plants and insects. We do have the ability to make this internship virtual, if circumstances require. Virtual internships would focus on the learning and applying of analytical skills (GIS, R programming, conservation planning software, for example) in support of conservation planning for native bees in the Great Lakes basin, as well as other animal and plant species of conservation concern in the region.

BENEFITS TO INTERN

This project meets research needs of the US National Park Service and the US Fish and Wildlife Service. As such, it provides a real-world view of conservation challenges those land management agencies face and how research helps those agencies meet those challenges. The intern will work directly with NPS colleagues and will have multiple opportunities to observe how NPS and USGS interact to define and prioritize management problems and responses to those problems. There will be an opportunity to learn multiple skills related to carrying out field experiments, using genomic approaches for identifying habitat use patterns of native bees, and participating in data analyses ranging from simple to somewhat sophisticated spatial analyses. While scientific skill development is an important benefit for the intern, the opportunity to observe the interaction between conservation researchers and resource managers might make this a particularly valuable learning experience. Finally, the goal of this

internship is to improve the skills of the intern not only in how to do ecological research but, perhaps more importantly, how to work effectively in a complex workplace.

MENTORING PLAN

In this position, mentoring is a daily occurrence, both from the principal investigator on the project and the USGS technical staff and from our National Park Service colleagues. The entire internship will emphasize gaining perspective – what is the nature of conservation challenges, how is research formulated to understand those challenges and to seek solutions, how do conservation responsibilities differ between agencies, how do you prioritize projects? Simply stated, the mentoring plan includes asking the why along with the how whenever possible. Why are we doing a particular project or activity in addition to how to do a particular activity? Everyone on the team is encouraged to discuss both the why along with the how. That communication is the key mentorship resource that we recognize and encourage. The whole summer is about gaining and retaining perspective, so that the experience stays with the intern even if the specific skills might fade. Additionally, we encourage interns to attend the CFSP webinars available on topics important to career development and use provided mentoring resources to increase awareness of common problems that negatively affect communication in the workplace.

ADDITIONAL DETAILS

STUDENT SKILLS AND INTERESTS

Experience with GIS, R or Python, laboratory genetic techniques, gathering ecological data in the field a plus. Enthusiasm about conservation. Eagerness to learn new skills. Attention to detail. Interest in pollinators.

LOCATION: Chesterton, Indiana

ACTIVITY LEVEL:

Level 8-2: The work requires some physical exertion such as long periods of standing, walking over rough, uneven, or rocky surfaces; recurring bending, crouching, stooping, stretching, reaching, or similar activities; or recurring lifting of moderately heavy items. The work may require specific, but common, physical characteristics and abilities such as above-average agility and dexterity.

FIELD WORK 25-50% **VIRTUAL?** The internship could be reconfigured to emphasize the data analytical part of the internship, if circumstances require. Onsite participation is preferred and would provide a more varied experience but we have successfully done these internships virtually

LAB WORK 0-25%

OFFICE WORK 25-50%

OTHER 0-25%

PROJECTED START DATE 5/2/2022

EXPECTED DURATION 90 days