



2021 Cooperative Summer Internship Program

USGS Project Scientist	Ralph Grundel
Project start date	5/17/2021
Duration	10-12 weeks
Location	Chesterton, Indiana
Type of Intern	Any
Title of Project	Landscape connectivity and native bee conservation in the Great Lakes Basin
Background	Mounting evidence suggests that native bee populations are declining in many areas globally, potentially limiting pollination across multiple ecosystems. Conservation planning to reduce this risk is hampered by a lack of understanding of many basic aspects of bee ecology. This project addresses one such deficiency - how landscape fragmentation might affect distribution of native bees. We are addressing that concern through field experiments at Indiana Dunes National Park and with modeling of factors affecting the distribution of bees in the Great Lakes Basin.
Objectives	The study has two major objectives. First, documenting how native bees foraging and nesting behavior varies across landscapes as a function of landscape connectivity. Second, is to model landscape conservation value for native bees in the Great Lakes Basin.
Intern Tasks	Tasks will differ if the internship is in-person or virtual. If the internship is virtual, tasks will center on using conservation planning software to map the conservation value of landscapes throughout the Great Lakes Basin. If in-person, the internship will include field work at up to three national parks - Indiana Dunes NP (primary site), Sleeping Bear Dunes National Lakeshore, and Pictured Rocks National Lakeshore (secondary sites). The field work will emphasize documenting bee nesting site preferences. In addition, for in-person internship, the intern would assist in the conservation modeling process that would be the focus of the virtual internship. The intern might also participate in helping to develop the use of eDNA (environmental DNA) to identify bees visitation rates to plants.
Expected Results and Benefits to the Intern	Whether virtual or in-person, this internship opportunity would expose the participant to significant interactions between management agencies and conservation science and could allow for skill development in programming, data analysis, and design of experiments that provide answers for small and large scale conservation actions. Think of it as "reality conservation education". The intern would be exposed on a regular basis to needs of the National Park Service and of the Great Lakes Restoration Initiative, one of the country's largest conservation undertakings, and how we design science to provide guidance for implementation of conservation actions. The linkage between the need for the science and the management activities would be made clear to the intern

	and, perhaps as much as the field and modeling skill acquisition, would likely be the most valuable lesson taken away from the internship experience.
Skills and Interests of Candidates	The following are skills that would make a contribution to the project and that could be applied or improved during the internship: Programming (R), GIS, conservation planning software, entomology, botany, field data gathering.
Project Type	Field Work;Office Work;
Project Discipline	Ecology;Field Mapping;Modeling;Wildlife Biology;Climate Science;