Indiana Dunes National Park
Volunteer Service Description

Dragonfly Mercury Project
Citizen Scientist

Position Overview

The National Park Service is partnering with the University of Maine, the United States Geological Survey (USGS), and the Schoodic Institute to participate in the Dragonfly Mercury Project, a citizen science project to assess the level of mercury in national parks. Since 2011, over 100 national parks and more than 4,000 citizen scientists have been involved in this project, which utilizes the mercury that has bioaccumulated in dragonfly nymphs as an indicator of the mercury level in the wetlands and waterways in which they live. The Great Lakes Research and Education Center and the Great Lakes Inventory and Monitoring Network support this citizen science project at Indiana Dunes National Park.

Background

Mercury is a pollutant which exists everywhere and can become toxic. In its toxic form, above certain concentrations, mercury can harm wildlife and people. The National Park Service (NPS) works to protect the people who visit national parks as well as the wildlife that lives in these parks. It is important for managers to understand the level of mercury in the parks so that any potential threats to humans and wildlife can be identified.

The Dragonfly Mercury Project engages volunteer citizen scientists to collect juvenile dragonflies (dragonfly larvae or nymphs) in national parks. Dragonfly larvae live for years underwater eating insects and even small fish. Mercury builds up inside the larvae and can give scientists insight into the health of the waters in which they live. Mercury often enters parks as air pollution from distant, human-caused sources, like coal-burning power plants.

Wind can transport airborne mercury over long distances, depositing it in seemingly pristine areas like national parks. Once there, it enters the food chain and builds up (or bioaccumulates) in higher predators. Dragonfly larvae bioaccumulate higher levels of mercury than other types of water-dwelling insects because:

- They are predators that eat a lot of smaller insects and even small fish, making them high on the food chain.
- They can live up to 5 years underwater as a larva, accumulating mercury as they grow.

Dragonfly larvae are a food source for many types of fish. Anything that eats these dragonfly larvae also consumes the higher levels of mercury that the larvae have accumulated. Fish are then eaten by birds and mammals. Some of the fish that people like to catch and eat can have high levels of mercury, even in remote parks.

Unlike fish, dragonfly larvae are easy to capture with a net and identify. Citizen science teams send the data they collect to labs for mercury analysis. The results tell us about the amount of mercury present in the sampled water body.

Minimum Commitment

- At least one workday up to 5 hours.
- Work typically takes place during the spring/summer

Goal / Outcome of Job:

Collect dragonfly nymphs, dragonfly data, and site data at between one and four specific wetland sites in Indiana Dunes National Park.

Description of Duties

Work with a small team of people and follow scientific protocol to collect up to 15 dragonfly nymphs per site and collect site data.

- Some sites require more walking than others to reach the study location. Maximum walking time is about 20 – 30 minutes one way. Most walks are considerably shorter.
- Collect data on the site characteristics.
- Wearing waders and nitrile gloves, use nets to capture dragonfly nymphs longer than 15 mm.
- Identify nymphs to the family level, measure their length, prepare labels, package, store on ice, and complete data sheets.

Follow all park guidelines.

- Use all personal protective gear (including tick prevention).
- Ensure that all tools are used and stored properly.
- Ensure that all co-workers are working safely.
- If you find anything that you think might be an archeological artifact, please leave it in place. Please do not pick it up or disturb it. Instead, take a photograph and document the location of the piece and alert park staff.
- Never approach others engaged in illegal behavior.
- Call 1-800-PARK-TIP for all emergencies and to report a crime.

Knowledge/ Skills Desired

- Ability to use a dichotomous key/or a willingness to learn.
- The ability to work with a diverse community of volunteers and park staff.
- Knowledge and understanding of the National Park Service mission and goals.
- Understand and respect all park regulations and policies.
- Ability to walk up to ½ mile and wade through wetlands with sometimes challenging footing.
- Desire and ability to work outdoors.
- Ability to work in hot and occasionally inclement weather.
- Ability to work in diverse terrain and footing.

Difficulty Level

Average to Strenuous. Requires a combination of hiking and carrying heavy gear in tough terrain.

Working Conditions:

Work is performed outdoors in 1 – 4 specific wetlands within Indiana Dunes National Park, sometime between late spring and early fall. The project involves being outside for anywhere from 2 - 5 hours in a variety of weather conditions, including cloudy conditions, bright sun, high heat, and high humidity. Participants wear waders and walk through wetlands on potentially uneven ground, using a net to capture dragonfly nymphs. There can be exposure to wind, rain, uneven terrain, poison ivy, mosquitos, and ticks. Ground footing varies from trail surfaces to uneven forest floors and wetland edges, to sand and muck.

Benefits

- Be outside.
- Increase your knowledge about park wetlands and aquatic insects.
- Be part of a research project that will inform park management and the scientific community.
- Enjoy the scenery and wildlife of this spectacular park.
- Training in project procedures and park policies and knowledge of resources.

Safety

- Mandatory safety training will be provided.
- If a volunteer citizen scientist observes a violation which they feel requires a law enforcement response, they should never approach person(s) engaged in the illegal behavior. When volunteer citizen scientist is at a safe location, call **1-800-PARK-TIP** to report the situation.
- Informational contact with visitors may be made at the discretion of the volunteer citizen scientist based on their level of comfort.

Uniform

- Volunteer uniform.