Nature at School
Pre-lesson
Adaptations and Biodiversity

See what your students know:

Use this fun Kahoot to help the DNR understand what your students know on this topic before the program.

Learning outcomes:

Join DNR educator Katie McGlashen in exploring the landscape, ecosystems, and recreation opportunities at Waterloo Recreation Area, one of the largest areas of state land in the Lower Peninsula. Waterloo's biodiversity and unique landforms offer recreational fun for many, with humans and wildlife habitat in balance. This 30-minute presentation will meet the following learning outcomes:

- Understand how landforms create diverse habitats for wildlife and people to use.
- Describe some of the habitats found in Waterloo and the common adaptations of the plants and animals that live there.
- Describe the signs of a healthy habitat and explain how invasive species might be introduced to a habitat.
- Understand that public lands belong to you and are valued to protect wildlife habitat and provide opportunities for recreation, with social, health and economic benefits.

Background information:

Waterloo Recreation Area is close to the cities and suburbs of southeast Michigan. It is the third-largest state park and one of the most biologically diverse, as it sits on glacial deposits of various soils and landforms, creating a truly unique landscape for recreation and wildlife habitat. Many rare and specialized species require large contiguous undisturbed open space to survive, and they become threatened by barriers that reduce or fragment their habitat. Human activity has taken more than 53 percent of the 221 million acres of wetland in the lower 48 states. Conservation management plans help to retain undisturbed open space for wildlife species and plants with a preferred habitat, including those that are threatened or endangered; remove invasive species and designate areas for recreation use.

Resources:

- Michigan state park management plans

Suggested pre-activity:

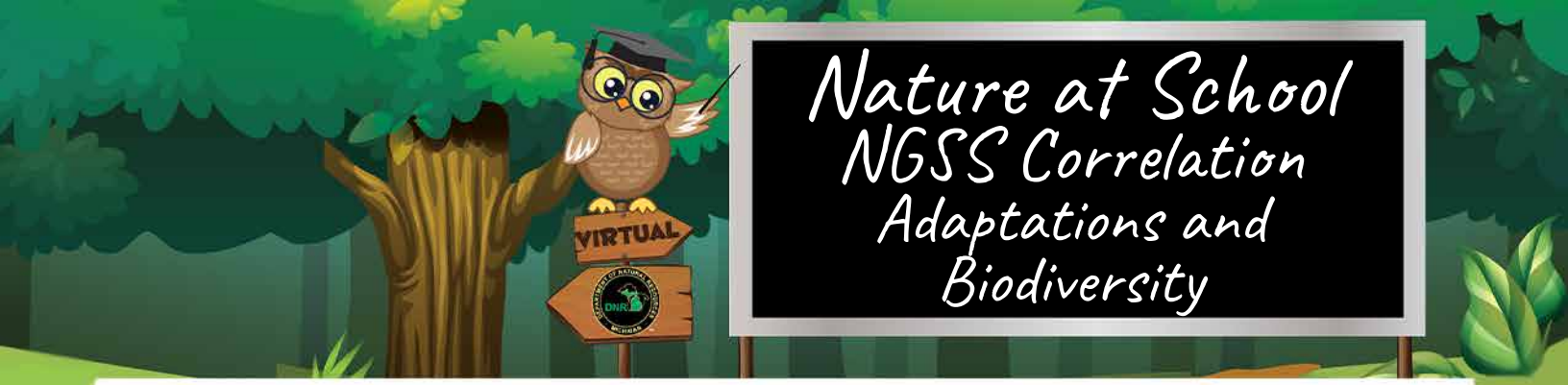
- Project WILD Activity Guide: Move Over Rover, grades 5-6

Directions for your *DNR Nature at School* virtual program:

1. You will receive a reminder email from SignUp Genius three days prior to your scheduled *DNR Nature at School* program. Please read and follow the directions, so we all can have a successful program.
2. At least one day prior to your lesson, send your instructor the link to your Zoom/Google Meet/Skype/Teams for your lesson time. Starting 10 minutes early with just your instructor is encouraged.

Day of

3. Make sure students have their sound muted and their cameras on to participate (with thumbs up, number on fingers).
4. If you use the chat feature, we encourage the students to ask their questions there, and the teacher can ask them at the end of the program.
5. See further directions in your SignUp Genius confirmation.



Nature at School NGSS Correlation Adaptations and Biodiversity

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Guiding question/phenomenon:

What impacts do human actions have on the park's ecosystems and habitat?

Science and Engineering Practice	Disciplinary Core Idea	Cross Cutting Concepts
Constructing Explanations and Designing Solutions Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects. • After the virtual lesson, students will design a park management plan with healthy habitat for specific species to survive, while allowing recreation and defend their design. **Analyzing and Interpreting Data** Analyze and interpret data to provide evidence for phenomena. • Students will make observations of the built and natural environment in Waterloo and compare/determine the kinds of plants and wildlife that would survive in their local park/ public space and why.	**LS2.C: Ecosystem Dynamics, Functioning, and Resilience** Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. • Students will review examples of human and biological impacts on the landscape at Waterloo. **ESS3.A: Natural Resources** Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. • Students review Waterloo examples.	**Stability and Change** Small changes in one part of a system might cause large changes in another part. • Students will review real-world examples of balancing human use and plant and wildlife survival in the park. **Systems and Systems Models** Patterns can be used to identify cause and effect relationships. • Students will learn and predict how specific human recreational uses of the park affect wildlife and plant populations.

Recommended grade band(s): middle school and high school
All Nature At School virtual programs have been created to introduce students at any grade level to life and/or earth science core ideas, when used with pre- and post-lesson suggestions.

Nature at School
Post-lesson Adaptations and Biodiversity

See what your students learned:

Use this fun Kahoot to help the DNR understand what your students know on this topic, after the program. This data helps the DNR create and update free programming for teachers across the state.

Activity wrap-up:

Waterloo Recreation Area is home to a large diversity of plants and animals that share the park with people. The Michigan Department of Natural Resources takes care of our public lands, including state parks and recreation areas, by following a management plan that creates zones within the park for different types of use. This protects some of the park from development while allowing other areas for human interaction with nature through recreation.

Resources:

- MEECS Ecosystems and Biodiversity
- MEECS Land Use

Connect to home:

Hold a BioBlitz in your own backyard. A BioBlitz is an inventory of all the plant and animal species that live in a defined habitat. Make a list of each species and use sampling methods to estimate the population of each species in your backyard habitat.

Post-activities:

- Career Critters from Project WILD
- Ultimate recreation land use map activity. Land use map activity teacher key

Connect with DNR content:

For a daily dose of nature, like MiNatureDNR on Facebook.

Visit the DNR Nature at Home page for educational video series, resources, lessons, virtual tours and more.