Detroit River Aquatic Habitat and Ecosystem

Grade Levels: 3rd - 5th

Standards Alignment

Michigan Science Standards (NGSS Aligned)

- 3rd Grade:
    - **3-LS4-3:** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
    - **3-LS3-2:** Use evidence to support the explanation that traits can be influenced by the environment.
- 4th Grade:
    - **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival.
    - **4-ESS2-1:** Make observations and measurements to provide evidence of the effects of weathering or erosion by water.
- 5th Grade:
    - **5-LS2-1:** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
    - **5-ESS3-1:** Obtain and combine information about ways communities protect Earth's resources and environment.

Materials

- Lesson Activity Guide
- Clipboards
- Pencils
- Wilson Park map
- Small buckets (optional)

- Small shovels (optional)
- Magnifying glasses (optional)
- Binoculars (optional)

Lesson Vocabulary

- **Ecosystem** – a community of living things (plants, animals, and insects) and the nonliving things around them, all working together in one place.
- **Habitat** – the natural home where a plant or animal lives and gets what it needs to survive.
- **Wetland** – an area of land that is covered with water for all or part of the year, such as a marsh or swamp. Wetlands help clean water and provide homes for wildlife.
- **Shoreline** – the edge where land meets a body of water, like a river, lake, or ocean.
- **Riparian** – the land and plants along the edge of a river, stream, or other body of water.
- **Native species** – plants or animals that naturally live in a certain area and have lived there for a very long time.
- **Adaptation** – a special feature or behavior that helps a plant or animal survive in its environment.
- **Erosion** – the process of wind, water, or ice slowly wearing away soil or rock.
- **Water quality** – how clean and healthy water is for people, plants, and animals.
- **Pollution** – harmful materials added to the environment, such as trash, chemicals, or smoke.
- **Conservation** – protecting and caring for natural resources like water, plants, animals, and land.
- **Human impact** – the ways people affect the environment, either positively or negatively.
- **Litter** – trash that is left on the ground instead of being thrown away properly.
- **Filter** – to remove dirt or harmful materials from water or air.
- **Thrive** – to grow, stay healthy, and do very well.

Pre-Visit Activities

Prepare your group for the field trip with these in-classroom pre-visit activities.

Field/ Nature Journal Observation Practice

- Set up a notebook to be the students' "Field Journal" or "Nature Notebook"
- Consider setting a weekly (or other cadence) routine of going outside on the school ground for a nature walk
    - This will teach students to observe, record, and analyze
    - This will also help students grow comfortable being outside prior to the outdoors field trip
    - Look for signs of healthy vs. unhealthy habitat on the school grounds
    - Look for signs of human impact

Living vs. Nonliving Sort

- Using picture cards in groups, academic vocabulary words, or a whole class t-chart, have students separate items into living versus non-living
    - Scaffold up or down depending on the ages of your students

Human – Impact Case Study

- Show general pictures of a polluted shoreline versus a wild and cared for wetland
    - Have students note the difference between the two
        - Prompt students to notice the problems that arise, causes of pollution, who/what is impacted by a lack of care, etc.
- Riverfront Connection
    - Have students go to: https://www.detroitriverfront.org/plan-your-visit/parks-greenways/mt-elliott-park
    - Students can click on any of the parks and greenways listed there and scroll down to the before and after photo sequence on each page.
    - These photos show positive impact, but prompt students to think about the big picture.
        - Why did the land or river look like that prior to Riverwalk opening?

- How are all living organisms impacted by how we care for the land and river?
- How do you think the river ecosystem has changed since the Riverwalk opened?

Word Wall/Word Study

- Use books, word walls, word study, or picture-word sorts to introduce the important vocabulary students will use and encounter in real life on the field trip

Erosion Experiment

- Necessary Materials:
  - Trays for each group
  - Sand or soil for each group
  - Cup/pitcher of water for each group
  - Small gathering of sticks, twigs, leaves
- Have students pour water onto the soil/sand first and observe the sand/dirt washing away
- Then, have them add in the plants, sticks, leaves and pour water again
  - Prompt students to notice the difference in what water does when there are plants in the soil versus no plants protecting the soil (shoreline)

Books – The following books are available through the Detroit Public Library. Both fiction and non-fiction books create opportunities to introduce difficult concepts in the classroom; consider adding these books to your classroom library before or after the field trip!

- *Haven Jacobs Saves the Planet* by Barabara Dee
  - A fictional chapter book about a 12 year old dealing with anxiety about the climate crisis and looking to take action
- *Riverkeeper: Protecting and American River* by Nancy Fuscro
  - A nonfiction book around the real story of how the "riverkeepers" worked protect the Hudson River.
- *The Day the River Caught Fire* by Barry Wittenstein

  - A picture book about the true story of how a 1969 fire in the Cuyahoga River helped foster awareness of water pollution
- *Friend on Freedom River* by Gloria Whelan
  - A historical fiction chapter book on the how the Detroit River served a gateway to freedom for enslaved Americans.
- *Over and Under the Pond* by Kate Messner
  - A picture book that celebrates the forms of life that live above and under a pond; most of the forms of life mentioned can be found in the Detroit River ecosystem.
- *Patience… Discover How the Best Things in Life Take Time* by Rachel Williams
  - This is a non-fiction book about the length of time it takes for things to exist and grow in nature and what that teaches humans about patience.

Lesson Sequence and Instruction

Arrival and Introduction (10-15 minutes)

- Walk to dock, gather in a circle.
- encourage students to find a spot along the railing to look outward towards the **Huron–Clinton Metroparks Water Garden**.
- Begin with this guided mindfulness activity to help students connect to nature:
  - Tell students you will count from 10 to 0. When you get to 0, quiet your voices and find something in or around the **Water Garden** to focus on.
  - As you find something to focus on with your eyes, take note of your body.
  - How does the "outside feel"? Can you feel the sun touching your skin? Is there wind or rain? How does it feel on you?
  - Now focus on your hearing? What sounds stick out to you? Can you hear any birds or animal sounds? What about the sounds of a city? Can you hear cars or humans? Is the water making a sound?

    - Now, finally focus back on the spot you picked? What color is it? Is it living or not living? Do you think it will look the same in all seasons?
- Have students turn back to the center of the circle to face the instructor
- Reflect and Share: Direct students to turn towards a partner next to them share something in nature they felt, heard, and saw.
    - Call on a few partners to share their observations aloud
- Key point to emphasize: Nature is all around us even in the middle of the city. Wilson Park is full of plants, animals, and a complex river ecosystem. We are connected to this ecosystem and have a responsibility to care for it.

Aquatic Ecosystems: Shoreline Habitat and Wetland Habitat Observation Stations (35 minutes)

- Leave the dock and walk around to the **Outdoor Classroom**. This will be your home base for the rest of the field trip, with one station being the **Water Garden** and the other station being the Riparian Habitat Zone.
- **Setup (5-10 minutes)**
    - Gather students into a circle and point to the two zones that students will be doing observations
    - Tell students that today they will be making observations and gathering information about two types of aquatic ecosystems we see at Ralph Wilson Park: Shoreline Habitat and Wetland Habitat
    - Pass out clipboards, writing utensils, and the two habitat observation documents
    - Options for stations:
        - If you have enough chaperones and feel like a chaperone could lead a station, split the group into two and do one station for 15 minutes and switch
        - If you want to stay altogether, do one station for 15 minutes, then go to the next station together.
- **Shoreline Habitat Station:**
    - Walk students towards the riparian habitat zone and direct them to read the riparian habitat zone description at the top of the page.

        - Riparian Habitat Zone: land habitat that occurs right on the edge of a riverbank. Riparian zones are wildlife corridors that filter pollutants, reduce erosion, and create important habitats for all life in and around the river.
    - Put students into pairs and have them walk up and down the shoreline of the Detroit River looking for signs of a thriving and/or struggling shoreline habitat at Ralph Wilson Park
    - If you have tools like tiny buckets, magnifying glasses, or binoculars – share these with students to aid in their observations
    - Share these signs and questions with students and chaperones to help direct students as they go on their observation walk
    - Signs of a thriving shoreline habitat:
        - A variety of native plants
        - Plants growing right along the water's edge
        - Birds (blue herons, geese, ducks, etc.)
        - Fish swimming or jumping nearby
        - Insects (butterflies, moths, dragonflies)
        - Insect shells
        - Water is mostly clear
        - Visible current in water
        - No strong chemical smell
        - Rocks and natural debris present
        - Logs/driftwood in the water or on the shoreline
        - Small amounts of litter
    - Shoreline Habitat Questions:
        - There are different types of shorelines in this park; why do you think that is?
        - What signs of life do you notice along the shoreline?
        - What evidence do you see of a healthy river ecosystem?
        - What evidence do you see of an unhealthy ecosystem?
        - Which parts of the shoreline do you think animals, such as birds or fish thrive more at?

        - What helps the birds and fish thrive along this shoreline habitat?
        - What would make the shoreline habitat better for both human and non-human living things?
    - Have students wrap up their observations of the Ralph Wilson Park shoreline and prepare to move over to the **Water Garden**
- **Wetland Habitat Station:**
    - Walk students to the gravel "beach" area of the water garden and direct them to read the wetland definition at the top of their page
        - Wetland Habitat Zone: The **Huron-Clinton Metroparks Water Garden** is a form of wetland, called "nurseries of life," because they can support thousands of species. Wetlands support biodiversity, filter pollutants and sediment from the water, and minimize erosion.
    - Put students into pairs and have them follow the nature trail around the perimeter of the **Water Garden** looking for signs of a thriving and/or struggling wetland habitat at Ralph Wilson Park
    - If you have tools like tiny buckets, magnifying glasses, or binoculars – share these with students to aid in their observations
    - Share these signs and questions with students and chaperones to help direct students as they go on their observation walk
    - Signs of a thriving wetland habitat:
        - Tall grasses
        - Cattails
        - Plants growing in soggy soil or right at the water's edge
        - Plants growing in clusters or different heights
        - Birds like blue herons, ducks, geese, red-winged black birds
        - Frogs or able to hear frog calls
        - Insects/bugs like mosquitoes, beetles, dragonflies
        - Slow moving or still water
        - Clear to slightly cloudy water
        - Muddy or soft ground
        - Broken stems and leaves on the ground

        - Few footprints on crushed plants
        - Little to no trash
        - Signs explaining the wetland and how to protect it or treat it
    - Wetland Habitat Questions:
        - What makes you think this habitat is unhealthy or healthy?
        - What evidence dop you see of a healthy wetland ecosystem?
        - What evidence do you see of an unhealthy ecosystem?
        - How is the water moving?
        - What do you think helps birds, fish, and insects thrive in this habitat?
        - How might humans benefit from interacting with a wetland habitat like this?

Model of a Thriving Ecosystem and Closing Circle (10 minutes)

- Gather the group back at the **Outdoor Classroom**
- Remind students that all living and non-living organisms work together to create a healthy system
    - Give students five minutes to create a model of a healthy ecosystem. They can draw, write, or build something on their worksheet. They could also use rocks, twigs, and other natural materials around to create a model of what a healthy ecosystem means to them.
- After five minutes, gather in a circle and share highlights of elements of a healthy shoreline habitat, wetland habitat, and their models of a healthy ecosystem.

Post Visit Extension Activities

Optional classroom activities to extend their learning from their field trip experience.

Detroit River Ecosystem One-Pager (Science/ELA/Art)

- Have students create a summary of the key takeaways form their trip on a single piece of blank paper
- Optional prompts to include:
    - Include five things you interreacted with; organize them into living versus non-living things
    - Write/draw four aspects of a healthy shoreline habitat and four aspects of a healthy wetland habitat
        - Scaffold up by requiring students to provide evidence to support why the shoreline habitat or wetland habitat was healthy
    - Include images and drawing of both the shoreline and wetland habitats, having student reference their notes/journaling to include animals or plant they encountered while at the park
    - Include an action item: draw or write about one thing someone can do to protect shorelines and wetlands
- Display the one-pagers for the school community to learn from

Detroit River Ecosystem Mural (Science/Art)

- Get a large piece of butcher block paper to create a mural that will be hung on the classroom or hallway walls
- On the paper, direct students to draw and label:
    - Plants
    - Animals
    - Water features (the shoreline and wetland)
    - Human protection areas
- Include humans/their classmates in the mural experiencing the ecosystem
- Make it as vibrant and in-depth as you have time for

Human Impact Writing Piece (Science/Social Studies/ELA)

- Have students write an explanatory or opinion piece based on the content covered while on the field trip
- Include time for research and additional learning, if needed

- Direct students to use their own observations from the trip and evidence of the habitats they encountered on the trip in their writing
- Optional Prompts:
    - How can humans protect and care for the Detroit River?
    - Why is wetland and shoreline habitat important to our community?
    - What makes up a healthy river ecosystem? What makes up an unhealthy river ecosystem?

Detroit River Aquatic Habitat and Ecosystem

Ralph C. Wilson, Jr. Centennial Park

3rd - 5th

Shoreline Habitat - Student Guide

Directions: With your partner, walk up and down the shoreline. Look for signs of a thriving and/or struggling shoreline habitat.

Riparian Habitat Zone: land habitat that occurs right on the edge of a riverbank. Riparian zones are wildlife corridors that filter pollutants, reduce erosion, and create important habitats for all life in and around the river.

Shoreline Habitat Observations

Describe the following thriving shoreline habitats signs you see:

Birds:_____

Insects:_____

Variety of plants:_____

Check off signs of a thriving shoreline habitat you see:

- ☐ plants growing along the water's edge
- ☐ mostly clear water
- ☐ little to no litter
- ☐ water has a current/ is moving
- ☐ no strong chemical smell
- ☐ insect shells
- ☐ rocks and natural debris
- ☐ logs/driftwood in the water or on the shoreline

Model of a Thriving Shoreline Habitat

Directions: Draw or write below a model of a healthy, thriving shoreline habitat. How do all living things support each other to create a thriving habitat?

Detroit River Aquatic Habitat and Ecosystem

Ralph C. Wilson, Jr. Centennial Park

3rd - 5th

Wetland Habitat - Student Guide

Directions: With your partner, walk all around the perimeter of the Water Garden. Look for signs of a thriving and/or struggling wetland habitat.

Wetland Habitat Zone: The Huron-Clinton Metroparks Water Garden is a form of wetland, called "nurseries of life," because they can support thousands of species. Wetlands support biodiversity, filter pollutants and sediment from the water, and minimize erosion.

Wetland Habitat Observations

Describe the following thriving wetland habitat signs you see:

Birds:_____

Insects:_____

Variety of plants:_____

Check off signs of a thriving wetland habitat you see:

- ☐ plants growing along the water's edge
- ☐ tall grasses
- ☐ cattails
- ☐ plants growing in different heights
- ☐ slow moving or still water
- ☐ muddy ground
- ☐ little to no trash
- ☐ few footprints on crushed plants
- ☐ broken stems or leaves

Wetland Habitat Think & Reflect

Directions: What makes you think this wetland habitat is healthy or unhealthy? Draw or write your response below. Include evidence that you saw today in your response.