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 **Great Lakes, Great Times, Great Outdoors**

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**Lessons Learned From the Bald Eagle**

**Classroom Pre-Visit Program Description Saginaw Bay Visitor Center**

**Level: 4th, 5th or 6th Grade Bay City State Recreation Area**

**SCHOOL SITE VISIT PROGRAM DESCRIPTION:**

Students participate in a naturalist led lesson, involving 4 components (*total time: 2 hours*):

1. ***Case Study of the Bald Eagle* (*45 minutes*)**– share a power point presentation introducing the traits and characteristics of our national bird and reinforce using study skin, skull, egg etc. Presentation highlights case study on how man’s use of the land brought about environmental changes that nearly caused the extinction of many top level food chain members including the bald eagle. Introduces students to concept of “bioaccumulation.” and the resulting historical environmental legislation that was man’s response to the dilemma (the Clean Water Act, the Clean Air Act and the Endangered Species Act).
2. ***Deadly Links Learning Module* (*25 minutes*)** – students take part in a simulation game, in which they role play different members of the Eagle’s food chain and discover how toxins concentrate in higher and higher levels as you go up the food chain *(note: please reserve large space for this game (either a gym or outside space).*
3. ***Fishing Game Learning Module* (*25 minutes*)** – Students identify and measure a fish that they “caught” and look up on the Michigan Fish Consumption Advisory chart whether they should eat it or not.
4. ***Enviroscape Learning Module (25 minutes )*** – A demonstration of how toxic chemicals and other point source and non-point source pollutants enter the ecosystem by way of the hydrologic cycle using a watershed model.

*\*Please note: If you cannot designate a full 2 hours to the program, some or all of the Learning Modules will be moved to the field trip elective, depending on how much time is available.*

**PROGRAM GOALS:**

1. Each student will gain knowledge about the role man has played in altering the freshwater ecosystem of the Saginaw Bay and its impact on future use of the resource.
2. Students will gain an awareness of how pollutants in the environment can affect the health of animals and humans.

**PROGRAM OBJECTIVES:**

1. Students will be able to name one human impact that influenced changes in fish and bird populations in the Great Lakes aquatic ecosystem.
2. Students will be able to explain how environmental changes in the bald eagle’s habitat produced a dramatic change in the food web.
3. Students will be able to identify run-off as the part of the water cycle that carries pollutants to rivers and lakes.
4. Students will be able to identify 2 persistent toxic chemicals found in the Saginaw Bay and their source.
5. Students will be able to construct a diagram showing how a toxic chemical can bioaccumulate up a food chain.
6. Students will be able to determine what the fish advisory for a particular fish is by using a measuring stick and the MDCH Fish Consumption Advisory Guide.

**ADDITIONAL LEARNING OUTCOMES:**

1. Students will learn about the four components which make up a fish’s habitat: Food, Water, Shelter and Space.
2. Students will be able to describe 4 different members of a Great Lake food chain/food web and their place in it and will identify themselves as predators at the top of the aquatic food chain.
3. Students will learn about behavioral characteristics of the bald eagle, and two fish that help them survive in their environment
4. Students will be able to describe physical traits of predators and prey that contribute to their place in the food chain.

**PREPARING YOUR STUDENTS FOR THE CLASSROOM VISIT:**

1. Review vocabulary: Predator, prey, bioaccumulation, persistent toxic chemical, pesticide, herbicide, run-off, sediment, point source pollution, non-point source pollution, evaporation, condensation, infiltration, precipitation, producer, consumer, decomposer, habitat, macro-invertebrate, adaptation, consumption, endangered species, ecosystem
2. Discuss how the students think water becomes polluted.

4. Have the students compose a diagram of a freshwater aquatic food chain.

**POST-VISIT SUGGESTIONS:**

1. Discuss the dioxin pollution issue that has affected the Tittabawassee River, Saginaw River and Saginaw Bay.
2. Obtain a list of land use precautions that the EPA has identified for people living or using land that has been contaminated by the dioxin.
3. Contact the Saginaw U.S. EPA office and see if a field agent is available to make a visit to your classroom or if they can make supplementary classroom materials available to your students.Mary Breeden, EPA, 804 S. Hamilton St., Suite 3, Saginaw MI, 48602 (989) 401-5509.
4. Contact Saginaw or Bay County Health Department and ask for information on other environmental health programs which are available for your students.

5. Review the “Eat Safe Wild Game” brochure and discuss how bioaccumulation of dioxin affects turkey,

duck and deer hunters and their families.

6. Have your students search the web for more information on bioaccumulation of toxic chemicals in the Great Lakes fish food chain.

7. Obtain a copy of Project Wild and conduct the lab, “What’s in the Water?”

8. Obtain free highway maps from the MDOT. Have the students select a fish that they like to catch and eat (from the list of game fish that have advisories on them) and using the Michigan Fish Consumption Advisory, mark on a state map what bodies of water have fish advisories for their fish with a highlighter.

**COORDINATING WITH MICHIGAN SCIENCE Grade Level Content Expectations:**

**Science Inquiry Process:** S.IP.04.11, S.IP.04.12, S.IP.04.14, S.IP.04.15, S.IP.05.11, S.IP.05.13, S.IP.06.11, S.IP.06.13, S.IP.06.14, S.IP.06.16.

**Science Inquiry Analysis & Communications:** S.IA.04.11, S.IA.04.12, S.IA.04.13, S.IA.05.11, S.IA.05.12, S.IA.05.13, S.IA.05.14, S.IA.05.15, S.IA.06.11. S.IA.06.12, S.IA.06.13.

**Science Reflection & Social Implications:** S.RS.04.11, S.RS.04.15, S.RS.04.16, S.RS.04.17, S.RS.04.18, S.RS.05.11, S.RS.05.12, S.RS.05.13, S.RS.05.15, S.RS.05.16, S.RS.05.17, S.RS.05.19, S.RS.06.13, S.RS.06.14, S.RS.06.15, S.RS.06.17, S.RS.06.19

**Life Science Organization of Living Things:** L.OL.04.16, L.OL.05.41, L.OL.06.52.

**Life Science Ecosystems:** L.EC.04.11, L.EC.04.21, L.EC.6.11, L.EC.06.21, L.EC.06.22, L.EC.06.23, L.EC.06.31, L.EC.06.32, L.EC.06.41, L.EC.06.42

**Life Science Heredity:** L.HE.05.11, L.HE.05.12

**Life Science Evolution:** L.EV.04.22, L.EV.05.11, L.EV.05.12, L.EV.05.14, L.EV.05.21.

**COORDINATING WITH M.E.A.P. SOCIAL STUDIES CONTENT STANDARD BENCHMARKS:**

 **Geographic Perspectives**

 ll.1 --- l.e.2

 ll.2 --- ­­­­­ l.e.1, l.e.2, l.e.4

 ll.4 --- l.e.5

 ll.5 --- l.e.1

**Civic Perspective**

lll.4 --- l.e.1