Middle School Wetlands Program at the Lincoln Marsh Natural Area

Wheaton Park District
and
Community Unit District #200

Prepared by:

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Wheaton Park District
Lincoln Marsh Natural Area

Middle School Wetlands Program
in cooperation with
Community Unit District #200

The Wheaton Park District's Lincoln Marsh Natural Area, a 130-acre parcel of land featuring wetlands, prairie and oak savannah, was purchased with local, county, state, federal and private funds. The area is used extensively by schools from throughout the west suburban region for environmental education. The local school district and Wheaton Park District staff are developing a long-term program to teach the values of wetlands to elementary, middle school and high school students from surrounding communities.

The Middle School Wetlands Program is being funded in part by the Illinois Department of Conservation, Natural Heritage Division Non-Game Wildlife Conservation Fund, through a grant received by the Wheaton Park District. The grant will help pay for the labor, program development, photocopying, teacher training, equipment and materials.

The Middle School Wetlands Program is interdisciplinary. Teachers of all subject areas will find the lessons to be useful in their curriculum. The program will focus on middle school grades 7 & 8, with this initial program development devoted to the seventh grade. The students will again be exposed to the values of wetlands, just as in the forth grade program but, this program will also compliment the sixth grade stream monitoring/water quality program.

The Middle School Wetlands Program will take place at the Lincoln Marsh Natural Area, located along Winfield Creek, in Wheaton. The goal of the program is to teach the following values of wetlands:

1) Wetlands store flood water
2) Wetlands filter and clean polluted water
3) Wetlands are unique habitats for threatened and endangered species of plants and animals
4) Wetlands serve as valuable educational and recreational areas for people.

Materials and Methods

The Middle School Wetlands Program will be held at the Lincoln Marsh Natural Area. District schools will visit the marsh for 1/2-day periods (3 1/2 hours) in groups of approximately 75-80 students. A total of approximately 850 7th-graders will be served for the first two years. Subsequent years will see the addition of 8th-graders, depending on the appropriate program modifications and the addition of needed staff. Ultimately, over 1500 middle school students will participate in the program each year.

The pilot program will be held during the Fall of 1993 when students from two middle school will visit the marsh. Full implementation will follow in the Fall of 1994. Students will have been provided with appropriate pre-visitation lessons, and will develop reports, data compilations, or other assessment lessons back in the classroom after their visit to Lincoln Marsh.

Four major activity or lesson areas are as follows:

Water Quality Analysis: Students will compare water quality in Lincoln Marsh and nearby Winfield Creek to determine which habitat has higher water quality and supports a more diverse population of invertebrates. This activity focuses on the ability of wetlands to improve water quality.

Natural and Cultural History: Students will trace the history and impact of natural and human systems on the hydrology of the region. This lesson employs timeline construction and related activities which focus on the value of wetlands in floodwater storage. This activity will be done in the classroom.

Plot Sample Studies: Students will investigate the value of wetlands as wild life habitat by recording the species and numbers of plants and animals found within a sampling area. Comparisons will be made between the findings of different groups in different areas of the wetlands.

Affective Response: Students will be introduced to wetlands as a recreational and educational resource through activities such as: discussions of feelings, observations and readings; writing in a variety of formats includ-ing verse, free-form, lists, descriptions, etc.; drawing and sketching pic-tures, maps, etc.; participating in activities such as eco-drama, exploration, orienteering, etc.; identifying and recording a variety of plants and animals using taxo nomic keys and field guides.

Water Quality Analysis

Goal: The students will learn about the ability of wetlands to filter and clean surface and ground water.

Objective: The students will measure and compare the amounts of sediment suspended in the water of the Lincoln Marsh wetland and Winfield Creek.

Objective. The students will measure and compare the amounts of oxygen in the waters of the Lincoln Marsh wetland and Winfield Creek.

Objective: The students will measure and compare the temperature of the waters of the Lincoln Marsh wetland and Winfield Creek.

Objective: The students will measure and compare the amount of nitrates and/or phosphates in the waters of the Lincoln Marsh and Winfield Creek.

Objective: The students will determine relative water quality ratings based on their chemical analysis of the waters of the wetland and the creek.

Objective: The students will use dip nets to determine the types of macroinvertebrates living in both the Lincoln Marsh and Winfield Creek.

Objective: The students will determine relative water quality ratings based on the types and abundances of macroinvertebrates found.

After receiving pre-trip instruction, the students, working in groups of three to four, will utilize written instructions, chemical analysis kits, data recording sheets, dip nets, laboratory pans, and macroinvertebrate identification sheets to conduct their field investigations. Each team will have an opportunity to measure water quality utilizing chemical and biological assessment tools. The information from each field exercise will be recorded. All information will be tabulated and compared back in the classroom.

Water analysis will be conducted at the following sites.
Lincoln Marsh Wetland
Biological Assessment: near base of Illinois Prairie Path Overlook
Chemical Assessment: at shoreline near ramp descending from Prairie Path
Winfield Creek
Biological Assessment: downstream side of IL Prairie Path culvert
Chemical Assessment: upstream side of IL Prairie Path culvert

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Lincoln Marsh Natural Area
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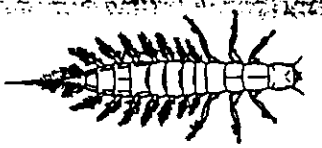
Chemical Analysis Data Sheet

Please follow instructions carefully.
If you have questions, ask!

	Winfield Creek	Lincoln Marsh
Suspended Sediment		
Dissolved Oxygen		
Temperature 6 inches below surface		
Nitrates/Phosphates		

Group I - These organisms are generally considered to be intolerant to pollution


Stonefly Nymph

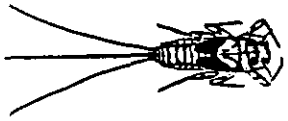

Adlerfly Larvae

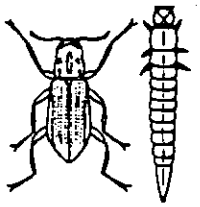

Dobsonfly Larvae


Snipe Fly Larvae

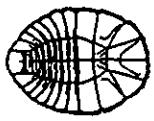
Group II - These organisms are generally considered to be moderately intolerant to pollution

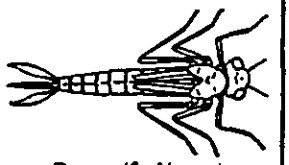

Caddisfly Larvae

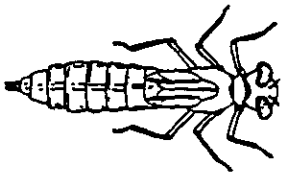

Mayfly Nymph

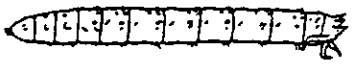

Adult Riffle Beetle

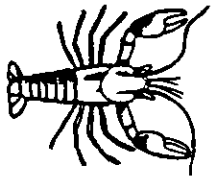
Riffle Beetle Larvae

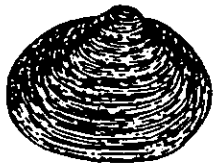

Water Penny Beetle Larvae


Damselfly Nymph


Dragonfly Nymph


Crane Fly Larvae

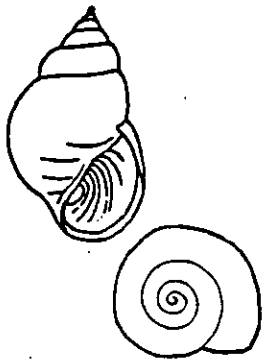

Crayfish

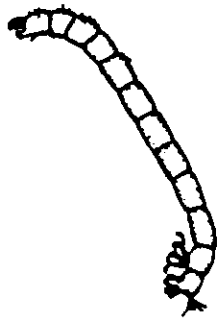

Clams/Mussels

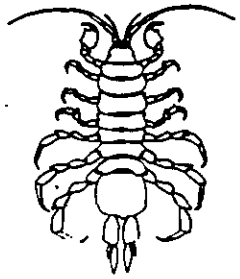
Group III - These organisms are generally considered to be fairly tolerant to pollution


Black Fly Larvae

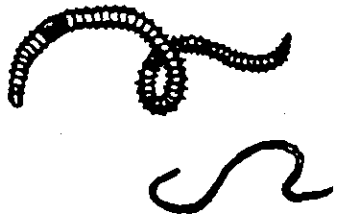

Scud


Right-Handed/Other Snails

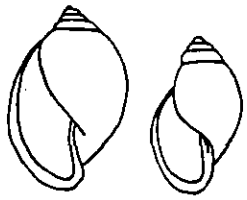

Midge Larvae


Sowbug

Group IV - These organisms are generally considered to be very tolerant to pollution


Aquatic Worms


Leech


Pouch/Left-Handed Snails

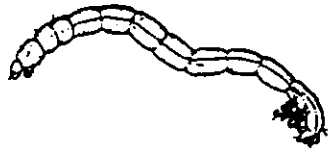

Blood Worm Midge Larvae

FIGURE 7: FIELD IDENTIFICATION REFERENCE SHEET

Organisms divided into their respective taxa groups

Natural and Cultural History

Goal: The students will appreciate the importance of wetlands in relation to the natural and cultural history of the northeastern Illinois area.

Objective: The students will construct a timeline in the classroom which depicts the chronology of geologic, geographic, biological and cultural development of the area.

Objective: The students will complete key activities in the course of timeline construction, which relate to specific subject areas such as biology, geology and geograhpy, history, etc. The activities will be in the form of written or oral discussions, drama, drawing and painting, or model building.

Objective: The students will demonstrate an understanding of the changes that have occured in regional hydrology due to human settlement and development, and the importance of wetlands to modern society in the control of flooding and stormwater.

Following are samples of the historical dates and corresponding information which can be used in the construction of the timeline.

15,000 years B.P. (before present)

The Lincoln Marsh was covered in ice. The Wisconsinan Glaciation was at its maximum, and this area was under ice one to two miles thick!

The incredible weight of the ice crushed rocks and boulders as it carried millions of tons of sediment into this area from the north. The movement and friction of the glacier levelled the landscape, creating the topography we have today.

12,000 years B.P.

The climate began to warm up, bringing an end to the Ice Age. The amount of water from the melting ice created torrential flooding along stream channels. As the ice melted, all the soil and rocks being carried by the glacier were dropped.

In some areas, large pieces of ice, like landlocked icebergs, broke off the main glacier and settled down into the ground. These depressions are known as "kettles" and are responsible for the creation of most wetlands found in the Midwest.

Vegetation began to move into this area as the ice retreated to the north. If we were to compare it to something we know today, we would call it tundra.

10,000 years B.P.

The climate was still rather cool compared to today. But the gradual warming caused the tundra to move northward, and behind it was the boreal forest. Boreal forests are made up of coniferous trees like pine, spruce and fir.

This area was home to huge Wooly Mammoths, mastodons, beavers the size of cows, and dragonflies as big as today's hawks!

The Lincoln Marsh was under a lot of water! Some people think this area was once a large lake, with the shoreline one-third of a mile west of where you are standing.

8,000 years B.P.

The climate continued to get warmer and the boreal forest moved northward into Wisconsin and Minnesota. Deciduous trees, such as oak, hickory, walnut, ash and maple, moved into this area from the southeast.

The Lincoln Marsh was still a large lake. But, it was full of aquatic plants and animals, which, when they died at the end of each growing season, fell to the bottom and caused the lake to fill in a little bit each year.

7500 years B.P.

Temperatures began to rise sharply at the beginning of the Hypsithermal Interval. The average global temperature went up by three to five degrees Farenheit. This warming again changed the vegetation. Forests, not able to withstand the dry heat, retreated to the south and east where there was more moisture.

In from the west came the Tallgrass Prairie. The prairie had developed to the east of the Rocky Mountains because of the small amount of rainfall. When rainfall amounts decreased here, the prairie began to move in, with a little help.....

Native Americans were establishing the first communities here.

4500 years B.P.

The end of the Hypsithermal Interval. The prairie, 22 million acres of it, was firmly established as the dominant plant community in Illinois. But, it had some help in getting established.....Fire would race across the plains in the fall or early spring, killing most of the trees that were remaining.

Around wetlands, trees were protected from many of the fires, and unique ecosystems developed. These plant communities are known as savannahs, and are characterized by large oak and hickory trees growing amid the grasses and forbs of the prairie.

4000 years B.P.

The Lincoln Marsh (Lake) was beginning to fill in, surrounded by mesic (wet) prairie and savannah.

Indians had learned to use the fire as a tool for hunting buffalo. They would surround a herd of buffalo with a circle of fire, leaving only one opening for the animals to escape through. As the buffalo came through the break in the fire line, the indians would throw spears and shoot arrows at the animals.

This area was incredibly productive from a biological standpoint. The marshes and prairies teemed with animals and, along with the large variety of plants, Indians lived comfortably.

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250 years B.P.

The first pale-faces arrived. The French Voyageurs travelled into this area by canoe from the north. They traded metal knives, cups, tools and jewelry with the Indians in exchange for beaver pelts, which were sent back to France to be made into hats. Beaver hats were *the craze* in Europe. The Voyageurs travelled 6-14 men per canoe. The canoes were huge, able to carry up to 4000 lbs. Many of the voyageurs were hired because they could not swim. If you couldn't swim, what would be the chances of you tipping over the canoe and losing all the valuable beaver pelts?

350 years B.P.

The area was inhabited by native Americans who spoke Algonquin. The tribes, or nations, of indians were known as the Souix to the west, and the Potawatomi to the East. The Potawatomi Indians were arriving in this area as they moved south along the west shore of Lake Michigan. The Potawatomi had been chased out of Ohio, across northern Indiana and up into northern Michigan, where they crossed the waters between Lake Superior and Lake Michigan at Mackinac Island. The cold temperatures compelled them to move southward into the Fox River and DesPlaines River valleys. They were quickly leaving their Eastern Forest homelands and traditions behind.

160 years B.P.

Warren and Jesse Wheaton had decided to follow their friend Eurastus Gary, and arrived in DuPage County from Pomfret, Connecticut. They all decided to talk with a Mr. Ogden to convince him that he should bring his railroad through their little community. Mr. Ogden said okay when the Wheatons and Mr. Gary gave him land for free. The railroad was laid through town, and through a small marsh just west of the town.

With the early settlers, came non-native species of plants and animals that would some day crowd out the native plants and change the land forever. These plants included honeysuckle and buckthorn, which moved into the savannahs and prairies.

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14 years B.P.

A local agency called the Wheaton Park District purchased a small parcel of land in order to preserve open space and save a small wetland habitat. DuPage County had become very developed. Almost all the wetlands and savannahs were gone forever, and the rivers had become polluted. Many of the animals had moved away to escape the hords of people.

2 years B.P.

A group of people got together on Earth Day 1990 and called themselves "Partners for the Lincoln Marsh." Their plan was to help the Wheaton Park District restore the Lincoln Marsh Natural Area, so that the area would look more like it did 200 years before, and again be a home to lots of plants and animals.

They helped clean up the garbage (12 cars and many dump-truck loads of refuse), fixed areas where the soil was eroding, laid new trails for people to walk on, and started cutting down the buckthorn and honeysuckle.

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20 years B.P.

The area known as Goose Island Marsh was a common playground for the more adventurous children in the surrounding neighborhoods. Tree houses and forts dotted the landscape, and lots of trails had been carved into the ground by motorcycles and bicycles.

City planners were allowing hundreds of truckloads of soil and old concrete to be dumped into the wetlands because the area was going to be filled in so houses and a golf course was going to be built.

Plot Sample Studies

Goal: The students will investigate the value of wetland as wildlife habitat.

Objective: Students will construct a quadrat along boardwalks or trails in Lin coln Marsh utilizing materials provided (Stakes, string, etc.).

Objective: Students will calculate the area of their quadrat.

Objective: Students will use a key to identify living organisms contained within their quadrat.

Objective: Students will count the number of individuals of each group con tained within their quadrat.

Objective: Students will draw a diagram of their quadrat using symbols to repre sent the groups and individuals of living organisms.

Objective: Students will measure abiotic factors of their quadrat, such as soil, water and air temperatures, light levels, soil moisture, etc.

Objective: Students will count and record the number of different animal species observed outside their quadrat.

Objective: Students will tabulate results and compare their findings in class to investigate species diversity, limiting factors, etc.

Affective Response

Wetlands as a Recreational and Educational Resource

Goal: Students will demonstrate their appreciation of the wetlands as a recreational and educational resource.

Students will be subdivided into small groups of 4 to 5 individuals. This activity will take one-third of the time available during the field trip to the marsh.

Objective: Students will participate in discussions of a variety of topics related to Lincoln Marsh.

Students can, as individuals, think about and brainstorm different aspects of the marsh, then, as a small group, discuss whatever seems appropriate to the interests of the group and the teacher's comfort level. These may include, but are not limited to: feelings, thoughts, observations, readings that may have been used prior to the trip, and quantitative findings if there have been any.

Objective: Students will participate ina writing activity to share feelings, thoughts and observations about the Lincoln Marsh as a recreational and educational resource.

Students, after having some time to think about and discuss the marsh, will be asked to complete a writing activity. This activity should fit with skills being taught in the language arts curriculum. The writing activities can include poems in a variety of forms, stories of fiction or non-fiction, free-form verse about thoughts and feelings, lists and descriptions about scien tific and quantitative findings related to the marsh.

Objective: Students will be given the opportunity to participate in a drawing activity focusing on the Lincoln Marsh as a recreational and educational environment.

The students will be provided with drawing paper and a variety of draw ing media (pencils, colored pencils, colored chalk, paints, etc.). They then may draw or sketch their surroundings at the marsh. The drawing exercise can be of a more technical nature and the students can create and draw charts, graphs and maps of their findings.

Objective: Students will be engaged in a variety of hands-on activities to explore the marsh.

These activities should be chosen with careful thought being given to the group and the facilitator's comfort level. Some possible activities include, eco-drama, acclimatization activities, marsh exploration, role-playing and orienteering.

Objective: Students will understand wetlands as an educational resource by identifying a variety of plants and animals in the marsh using taxomic keys and field guides.

With the assistance of park district staff and teachers, students will be led in investigations of the variety of plants and animals found in wetlands. Systematic identification procedures will be used to introduce toxonomical classification schemes used in the scientific fields.

Objective: Students will be able to relate their discussions, writings, drawings, identifications, and other hands-on activities to other students and persons back in the classroom to demonstrate the value of wetlands as recreational and educational resources.

Assessment

The type of assessment activities will be up to the discretion of the individual teachers. Activities and projects should incorporate the four major activity/ lesson areas outlined on page 2. Examples include: the development and completion of a storybook describing the whole-class experience, utilizing drawings and writing done by the students; letters to parents, community leaders or congressional representatives focusing on the importance of wetlands to humans and the natural world; oral presentations given to classmates or parents; dramatic presentations given to other grade levels or parents; written reports or descriptions of the experience with specific criteria to address each educational area or objective; a mural or other artistic representation of the class's experiences and findings.