4-H 1039
Marine Science

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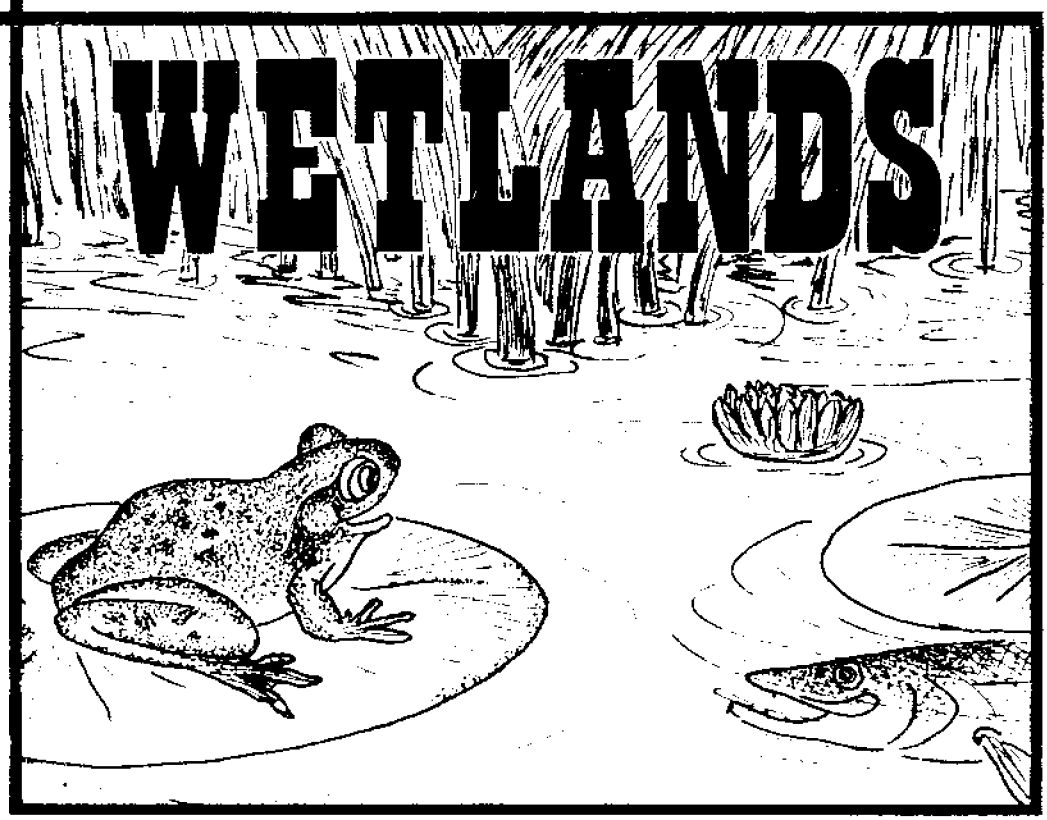

Leader / Teacher Guide

4-H — Youth Programs
Cooperative Extension Service
Michigan State University

LEADER/TEACHER GUIDE

for

WETLANDS

by

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This guide is a product of the cooperative efforts of the 4-H Marine Science Program (MSU) and the "Wetlands Team" of the DNR represented by Ned E. Fogle of the Fisheries Division. Ably assisting in development of the publication was Chris Newhouse, Environmental Conservation Education Graduate Student.

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Leader/Teacher Guide for WETLANDS

To the Leader/Teacher:

Wetlands are one of our most needed and least understood resources. Contained within this unit are the following materials:

Information—concepts necesary to the understanding of *Wetlands*—what they are, why they are important, why they are sometimes threatened, and how they might be preserved.

Discussion questions.

Optional activities.

Sources for teaching aids and further information.

BEFORE STARTING

1. Read the leader/teacher guide completely.
2. Read the member guide completely.
3. Note the additional resources for your *Wetlands* unit. If these resources are desired, prior ordering of materials and scheduling of resource persons are essential.
4. Decide which discussion questions and activity options will be emphasized. (You may wish to involve your class or group in these decisions.)
5. Be ready to further define or discuss any of the vocabulary words which the students may not know.
6. Choose which of the key concepts you will stress and be ready to emphasize these as they are encountered in the text.

OVERALL OBJECTIVES

- To help youth *understand wetlands* and their value to humanity.
- To survey the current status of the *uses of wetlands* and future alternatives based on these uses.

ORGANIZATION OF THE MEMBER'S GUIDE

KEY CONCEPTS

1. Wetlands are those areas which are wet at least some of the time. They have plants and animals depending on these wet conditions.
2. Wetlands have many important natural functions such as floodwater retention, groundwater recharge, sediment trapping, and wave barriers.
3. In their natural state, wetlands are valuable for cash crops, recreation, wildlife, and aesthetics.
4. Wetlands are being and have been destroyed, often to the disadvantage of the environment and society, for purposes of agriculture or development (residential, commercial, or industrial).
5. Some regulations exist to ensure the wise use of the remaining wetlands, but these need to be made more comprehensive and to be enforced for effective management.

VOCABULARY LIST

(some may be added or eliminated depending on the level of your group)

adjacent
aesthetic
appraisal
bog
buffer
comprehensive
consequences
cultivation
eligible
extinct
groundwater
impairment
impermeable
incentive
inclusive
irreplaceable
marsh
monitor
navigable
prudent
retention
saturated
sediment
slough
spawning
species
stringent
swamp
transit
unwieldly
water table
wetland

ACTIVITY SEQUENCE

The text in each section of the member's manual is an important prelude for the suggested activities.

Activity 1 — MAKE YOUR OWN WETLAND (page 5)

Demonstrate some of the properties of wetlands and how they are formed, using four jars and varying amounts of soil and organic material. Be sure there is an inch of gravel in the bottom of each jar. Add soil (different for each jar). Fill half full, with one inch of organic material on top. After adding tap water in 50 ml increments to each container of soil, wait at least two minutes. Which soil type drains most quickly? Why? Which soil type absorbs the most water before showing puddles? All containers now satisfy one of the conditions for being a wetland. Discuss what other conditions would be required for these containers to be "real" wetlands.

Activity 2 — WETLANDS NEED WATER (page 5)

Demonstrate the role of water in wetland formation, using four jars with soil and organic matter.

1. Add tap water to the containers in the following increments: 10 ml, 50 ml, 100 ml, and 200 ml.
2. After adding the above amounts of water, wait two minutes. If there is no standing water, add the same increments again. When there is standing water on the surface of the soil in one of the containers, stop adding water. Discuss the amounts of water necessary for the formation of a "real" wetland.

Activity 3 — TYPES OF WETLANDS (page 6)

Help members list and describe each type of wetland. Identify an example in your area. Hint: Deep marshes, shallow marshes, wooded swamps, shrub swamps, fresh or wet meadows, bogs, river flood plains, and seasonally wet areas (ponds). This is an excellent time to use the wetlands filmstrip with tape or script (listed under "Selected References" on page 9 of this guide). It will help members to see and relate to the different types of wetlands.

Activity 4 — LIFE IN A WETLAND SOIL (page 8)

A group activity for fall or winter for many wetland life forms spend part of their annual life cycle in "resting" stages in the soil.

Materials needed:

- 5- or 10-gallon aquarium
- A chunk of soil about 1 foot x 1 foot x 8-inches deep from an undeveloped area which floods every year (a river bank is excellent)
- A pond guide or some booklet which will help you to identify different kinds of pond life (recommended)
- A magnifying glass or low-power microscope (recommended)

Procedure

1. Place the soil in the aquarium and the aquarium on a window sill to get sunlight.
2. Add about 3 gallons of tap water which has been standing in jars or jugs for at least three days (this is to let some of the water-treatment chemicals break down).
3. Examine the aquarium water each day for two weeks. Note life forms.

Suggest a library research project on life cycles of wetland and pond dwellers.

Activity 5 — HIDE AND SEEK (page 11)

Encourage members to use some native fish in their aquarium demonstration. Suggest a contact with your nearest Department of Natural Resources fisheries biologist.

Activity 6 — EAT A CATTAIL (page 11)

A fun activity that can stimulate interest in wetlands and develop a new appreciation for nature.

Activity 7 — DESTRUCTION OF A WETLAND (page 14)

An opportunity to demonstrate how easily wetlands may be destroyed and the irreversible nature of the destructive action. Stress drainage, filling, and contamination.

Activity 8 — WHAT CAN WE DO? — Guest Speaker (page 16)

Help members to learn how to help in the wise use of our wetlands.

BEHAVIORAL OBJECTIVES

Upon completion of the activities, the member (student) will be able to:

(Following Section I)

1. Define a wetland.
2. Diagram three causes of wetland formation.

(Following Section II)

1. Describe several types and locations of wetlands.

(Following Section III)

1. Describe up to seven benefits of flood plains.
2. Cite at least one example of the above benefits.

(Following Section IV)

1. Describe the natural productivity of wetlands.
2. Cite several recreational benefits and uses of wetlands.

(Following Section V)

1. Describe the "greatest destroyer" of wetlands and reasons for this destruction.
2. Describe the benefits of drained wetlands.

(Following Section VI)

1. Name three agencies presently involved in wetlands management.
2. Name five legislative acts which affect wetlands.

MEMBER ACHIEVEMENT

The demonstrations in this unit are only one means of displaying achievement. Member development begins with broadened understanding of wetlands and their essential value. Members are offered many opportunities to learn about wetlands, to learn about interrelationships, and to see their own skills and knowledge develop. The accomplishment of the activities should result in pride of performance which is then visibly displayed through public demonstration.

INDOOR AND OUTDOOR

The activities in this project include some which may be conducted indoors and others for the outdoors. The convenience of indoor activity is, however, supplementary to the dynamic outdoor environment. Weather and seasonal variations provide a broad range of excellent opportunities for additional activities and further understanding of wetlands through direct experience as an essential part of our environment. Some of the experiences may be especially effective when conducted as group experiences while others offer particular value as individual explorations.

INTERDEPENDENCE

Throughout this unit, it is of value to stress the interactions that occur between air, soil, water plants, animals, and people. Treating one part of the ecosystem individually aids member learning. However, it is important that members understand how all the parts of an ecosystem fit together, each part affecting all of the others. Wetlands offer an exceptional opportunity for relating all parts of the environment together.

The 4-H Marine Science Project in cooperation with the DNR "Wetlands Program" *needs your help!* After teaching this unit, please take a few moments to complete the following evaluation. It will help us in future revisions of this unit, as well as in the development of related units. Any additional comments would be especially appreciated. Upon completion of the evaluation, please send it to:

Extension Project Leader
4-H Marine Science
Fisheries & Wildlife Department
Michigan State University
East Lansing, MI 48824

Wetlands Project

EVALUATION

HOW to use the form: Encircle the number after each statement that indicates the degree of inclusion of each "understanding" in this project or study unit (as you have taught it).

WHAT the numbers indicate: Degree of Inclusion

(1) — none (3) — some
(2) — very little (4) — very much

I. What is a wetland?

1. A wetland is an area which is wet at least part of the time and which has life forms requiring this moisture.	1	2	3	4
2. Construction of homes or other buildings on flood plains may have a bad result on the home as well as on the wetland.	1	2	3	4
3. Wetlands may be formed in several different ways.	1	2	3	4
4. (Activity 1) The group demonstrated wetland formation.	1	2	3	4
5. (Activity 2) Wetlands need water — how much?	1	2	3	4

II. Wetland types.

1. It is possible to have many different variations within the general idea of "wetland."	1	2	3	4
2. Several examples and types of wetlands were named.	1	2	3	4
3. (Activity 3) My own community or area has wetlands. The group identified them.	1	2	3	4

III. Value of wetland.

1. Wetlands have many different values to the environment and to humanity.	1	2	3	4
2. Without wetlands, we must suffer the consequences or pay the costs of providing the same benefits.	1	2	3	4
3. (Activity 4) The group was able to find life in wetland soil.	1	2	3	4

IV. Products from wetlands.

1. Wetlands are extremely productive lands.	1	2	3	4
2. Many cash crops come from wetlands.	1	2	3	4
3. Wetlands have lots of recreational benefits.	1	2	3	4
4. (Activity 5) The group used an aquarium and aquatic vegetation to demonstrate the importance of wetlands to wildlife (fish).	1	2	3	4
5. (Activity 6) The group learned about edible plants from wetlands (not limited to cattails only).	1	2	3	4

V. Wetlands destruction.

1. The greatest single destroyer of wetlands is man.	1	2	3	4
2. Most of Michigan's wetlands have already been destroyed.	1	2	3	4
3. There are some economic reasons for destroying wetlands, but these are usually not as great as the reasons for preserving the wetlands.	1	2	3	4
4. (Activity 7) Destruction of a wetland was modeled by the group.	1	2	3	4

VI. Wetlands regulation.

1. Many government agencies and policies are involved in wetland regulation.	1	2	3	4
2. There are many wetlands which are not protected by existing laws or agencies.	1	2	3	4
3. A comprehensive protection law and public education about the values of wetlands are among the solutions suggested for our wetlands resource.	1	2	3	4
4. (Activity 8) A guest speaker(s) helped the group to better understand wetlands.	1	2	3	4

ATTITUDES

For the following statements, please attempt to estimate the overall attitude of your group. Encircle the letter or letters which most closely represent your **group's** feelings about each of the statements.

SA – Strongly Agree A – Agree U – Undecided D – Disagree SD – Strongly Disagree

1. Wetlands are a necessary part of our environment.	SA	A	U	D	SD
2. Existing laws and agencies are sufficient to protect our wetlands.	SA	A	U	D	SD
3. Through taxes and other government sources, we all pay the cost of replacing the benefits of destroyed wetlands.	SA	A	U	D	SD
4. Many types of wildlife, including some waterfowl and fish, are directly dependent on wetlands for their existence.	SA	A	U	D	SD
5. Any person can prevent the needless destruction of wetlands, either by direct legal action or by reporting the destruction to the Department of Natural Resources.	SA	A	U	D	SD

We Invite your comments and suggestions. Please use an additional sheet if necessary.

Selected References

- *Wetlands and You* — pamphlet by the Department of Natural Resources
- *Did you know that Wetlands Are Nature's Masterpiece?* — pamphlet by the Department of Natural Resources
- *Wetland Values* — Slide/tape with 140 slides — developed by the Department of Natural Resources
- *Living Resources Program* — 7th Floor Mason Building, Lansing, MI 48926
- *Understanding Wetlands* — Filmstrip with tape and script—designed especially for educational program (an excellent supplement for this project) — Department of Natural Resources

For the above or more information write to:

Wetlands
Department of Natural Resources
Box 30028
Lansing, MI 48909

(or)

4-H Marine Science
Fisheries & Wildlife Department
Michigan State University
East Lansing, MI 48824

Additional Materials — Films, slides, publications:

- EPA — Environmental Protection Agency (Region V), One North Wacker Drive, Chicago, IL 60606
- DNR — Michigan Department of Natural Resources, I&E Division, Stevens T. Mason Building, Lansing, MI 48926
- MUCC — Michigan United Conservation Clubs, P.O. Box 2235, Lansing, MI 48911
- NFW — National Wildlife Federation, 1412 16th Street, Washington, DC 20036
- NAS — National Audubon Society, 1130 5th Avenue, New York, NY 10028

Write to the above for their catalogs of materials available which deal especially with wetlands and associated problems.