WISCONSIN COASTAL MANAGEMENT PROGRAM

Wisconsin Coastal Zone Management Program

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ONEIDA RESERVATION
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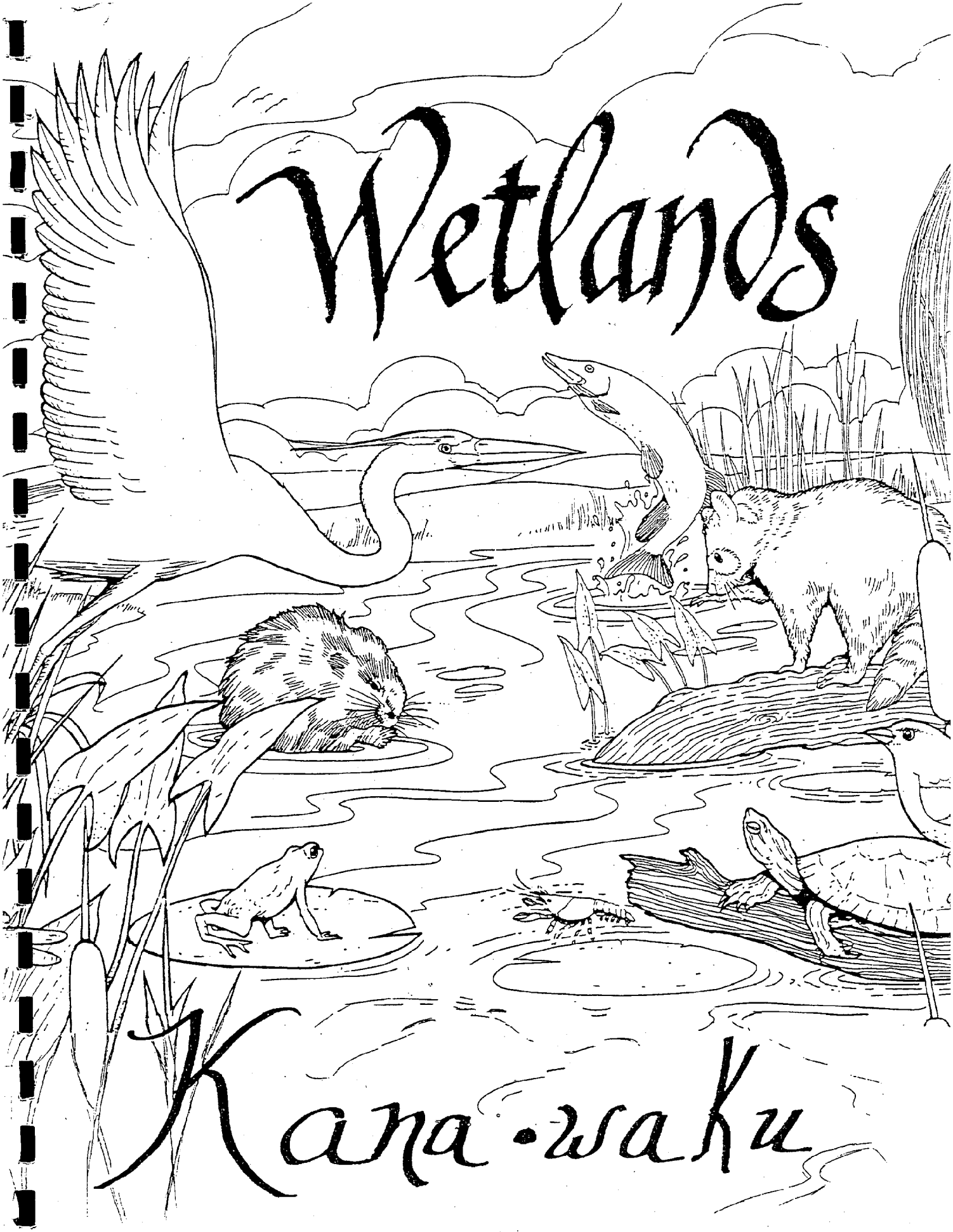
Wetlands
Kana·waku

ONEIDA WETLANDS

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Chapter 1

INTRODUCTION TO WETLANDS

Vocabulary:

a?so'·laku	-	swamp
kana·wáku	-	wetland
ohsa?k^·taku	-	marsh
onawa?tsta'·ke	-	mud

Before the Oneida people and the European settlers came to Wisconsin there were many forest lands, prairies and wetlands. Areas were cleared for farming. Forests were cut for the timber. Prairies were used for farming. The farmers saw the wetland areas provided some wildlife but these wet places also created some problems. During the summer months the wetlands were filled with stagnant water which provided breeding grounds for mosquitoes. The land was not good for growing crops or keeping farm animals.

Native people had always been thankful for the variety in nature. They appreciated the assortment of areas provided by the Earth Mother. They did not want to see changes made to the land and the earth's creatures displaced or destroyed.

Nevertheless, many wetlands were drained and filled to provide more farm land.

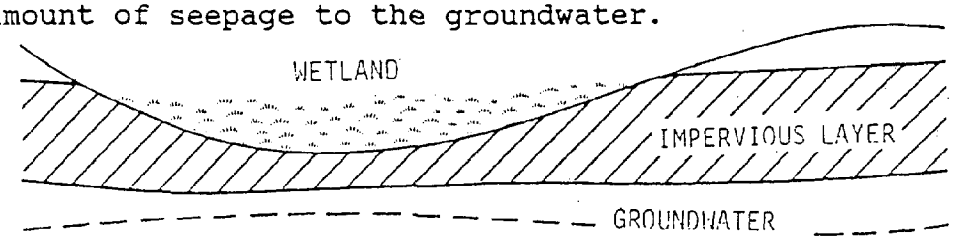
What are wetlands?

There are many different words for the different kinds of wetlands: swamp, bog, wet meadow, marsh, bottomland. The Oneida word for wetland is kana waku. Wetlands are identified by the water level, the kind of soil and the types of plants that grow. Recognizing a wetland is sometimes easy but it can be difficult because water levels, soils and plants are different from one area to another. There is no exact formula. Perhaps you can decide what makes a wetland here at Oneida and find some on a map of the reservation.

How are wetlands formed?

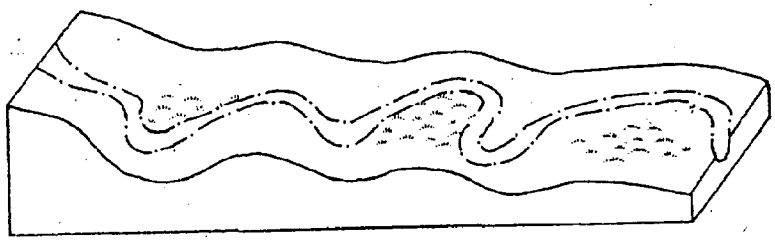
1. Wetlands are formed when the groundwater table is near, at, or above the soil surface in a depression.

2. Wetlands are formed when an layer of soil such as clay or fine silt prevents water from draining through the bottom or sides of a depression. This is called a "perched" wetland. The water level in this type of an area changes because of rainfall, evaporation and amount of seepage to the groundwater.



3. Wetlands are formed when groundwater comes out from a slope. This might happen on a hillside and is called a hillside seep.

4. Another way a wetland can be formed is when an area is frequently flooded by a lake, river or stream. Many wetlands are flooded only in the Spring but the water stays long enough to affect the soil and plants.



MARSH

A freshwater marsh is the most common type of wetland. The marsh holds water a few inches to a few feet over the soil. Plants found in a marsh are usually perennial, which means they grow every year without being reseeded. These soft-stemmed plants are sedges, cattail and bulrush. Water depth will determine which plants will grow.

BOG

A bog is an acid lake or pool usually found in areas that had been covered by glaciers. Bogs are peatlands formed by the gradual decay of plant material. the peat forms a floating mat of vegetation over water. The mat may include mosses, sedges, cattails, shrubs and even some trees. The many soft-stemmed plants fill the area like a sponge.

SWAMPS

Swamps usually have many woody plants like trees and shrubs. Some have hardwood trees like the Red Maple while others have more evergreen trees like the Cedar, Fir and Spruce. Within the swamp forest are many kinds of shrubs, some of which bear fruit. The Highbush Blueberry is one that is found regularly.

Draw an wetland area that you know. Which one of the examples most closely resembles your place? Can you find it on a reservation map?

Chapter 2

CHANGES IN THE LAND

Vocabulary:

Oneida	-	on^yote?a·ka	- people of the standing stone
Oneida, WI	-	okwehowé·ne	- an Oneida settlement

Before European settlers came to Wisconsin, wetland areas provided a place for the native people to hunt game and gather foods and materials used in their everyday life. Indian people gathered wild rice, different kinds of berries and grasses for weaving. In addition to fish, the native people trapped beaver, muskrat, mink and otter. They thanked the Creator for their brothers and sisters and used everything from their harvest.

The fur from these animals was highly desired by the Europeans and the pelts became major trade items for the Indian people.

Indian people liked having the new European trade goods such as cooking pots, axes, guns, cloth and beads. They were happy to trade furs for these things.

By the early 1820's the Oneidas living in their homeland called New York State, were having problems because of the number of European immigrants in their land. The white settlers wanted more and more land. Conditions were very bad. Some Oneida people decided to move to Wisconsin, another group moved to Ontario, Canada and some stayed in New York.

In 1823 the Oneida negotiated to get four million acres of land from the Menominee in Wisconsin. President James Monroe thought that was too much land and reduced the amount to only 500,000 acres, less than 13 percent of the land originally promised.

In 1838, the land area was again reduced. This time to 65,000 acres. At this time there was about 654 Oneida that had moved to this wilderness area.

Some Oneida became farmers and were encouraged to clear trees from the land. Lumbermen bought up all the trees and the white settlers wanted the cleared land for their own farms and livestock. Indian people were encouraged to sell their land and the federal government wanted to move all Indians onto reservations west of the Mississippi River.

The biggest loss of Oneida land came about because of the General Allotment Act in 1887. This law divided up reservation land into parcels. Each person was given a parcel but often families were not given land near each other which caused a breakdown of close family ties.

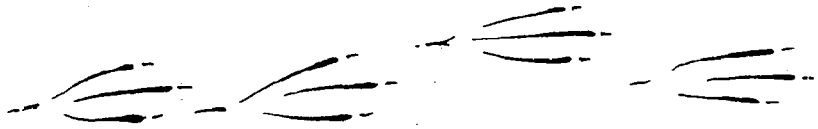
After 1908 property taxes had to be paid on each plot of land. Many lost their land to tax sales and foreclosures. Between 1923 and 1924 over 5,600 acres were drained on the Oneida Reservation. By the middle of the 1920's only a few hundred acres still belonged to Oneida people.

During this time of increased farming and land loss, many thousands of acres were cleared for farming. Wetlands were drained to create more land for crops. Some farmers that had wet meadows waited until the ground was frozen to harvest the marsh hay.

River channels were dug out so large boats could travel on the waterways. The dredged silt that was removed was placed along wet shorelines, eliminating more wetland area. River sites were used for homes and factories.

For over 150 years the wetlands in Wisconsin have decreased. Today, many people are beginning to realize the importance of wetlands. These areas are necessary for wildlife, for the quality of water and they protect us from floods.

The Oneida Reservation still has wetland areas. These places need to be protected.



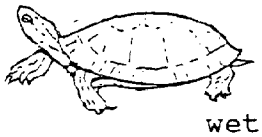
Great Blue Heron Tracks

Chapter 3
REPTILES, AMPHIBIANS AND FISH

Vocabulary:

snake	-	ótku, awistáni, or kwaʔwátkwal
turtle	-	aʔno·wáleʔ
frog	-	kwale·lé
fish	-	nyaʔtekʌtsyake
minnows	-	okála

TURTLES



Turtles are one of the reptiles found in wetlands. They like to live in the mud. They use their quick jaws to catch and eat fish, frogs, and insects. They are very resourceful. Several different types of turtles can be found in Wisconsin.

The turtle is very special to Oneida people. According to our creation story, the earth on which we stand is said to rest on a giant turtle's back. The turtle also represents one of our three clans.

Because of the loss of wetlands, some turtle species are becoming extinct. Remember, to protect your brothers and sisters and let them live with their own families. Never take them home. If you find turtles in a dangerous place, carefully move them to water, only if it is safe for you to do.

SNAKES

Snakes can be found in many different habitats. The snakes found in wetland areas may be found swimming through the water, sliding through tall grasses or sleeping in warm sunny places.

A few of the snakes sometimes found in this area are the Smooth Green Snake, the Eastern Ribbon Snake and the Northern Water Snake.

The Smooth Green Snake is a bright grass green snake that grows to be between 14 and 26 inches. It likes to hide in the green grasses and eats spiders and other insects.

The Eastern Ribbon Snake is a slender garter snake with three bright stripes running the length of its body. The snake can be between 18 and 40 inches when full grown. The Ribbon Snake likes wet meadows, marshes and weedy lake or stream shorelines. They feed on frogs, salamanders and small fish.

The Northern Water Snake is the largest of these three. It can grow to a length of 22 to 53 inches. It is reddish, brown or gray and has dark crossbands on its neck region with dark blotches on its back and sides. The belly is white, yellow or gray. Sometimes this snake is mistaken for the poisonous water moccasin snake.

The Northern Water Snake is not poisonous but will strike if frightened or cornered. This snake likes to sun itself on rocks or stumps near lakes, ponds, swamps and marshes.

FROGS

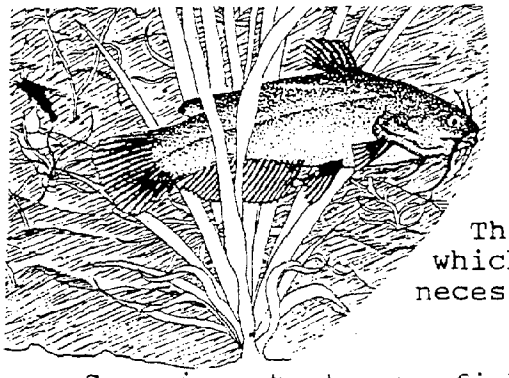
A number of different kinds of frogs can be found in wetlands. There are more than 3,000 different species of frogs throughout the world. Frogs have long legs that are used for quick jumps. Frogs eat many many insects and are welcomed by farmers and others who have to be concerned with insect damage.

FISH

The Golden Shiner, minnows, suckers and carp are some of different fish to be found. Many other varieties live in rivers and streams connected to the wetlands. They use the slow water areas to lay eggs. This is an important breeding ground for many kinds of fish.

Another fish found in deeper wetlands is the Black Bullhead. These fish are protected by a sharp spine on its back and one of each side behind its head. The bullhead are able to live in shallow, low oxygen waters of a wetland.

The fish look like catfish because of the barbels on its face that resemble cat whiskers. This species is a member of the catfish family. The whiskers are their feelers and tasters and help the bullhead to move along the muddy, murky bottoms in searching for food.



Bullhead eat insects, small crayfish, leeches, snails, frogs and plants. They usually feed at night which makes their barbels a necessity for survival.

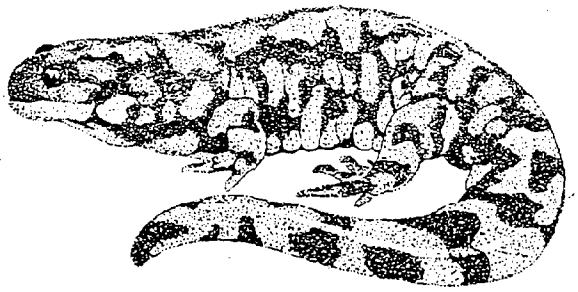
Some important game fish, especially Northerns from Duck Creek, like to swim into the floodplain wetlands. Crayfish are abundant food sources in the wetlands on the Oneida reservation.

SALAMANDERS

Salamanders are amphibians that live in moist environments. They spend part of their life in water. One salamander with black and olive-yellow blotches is called the Tiger Salamander. They burrow into fallen leaves and soil like moles.

Each spring they lay around 100 gelatin covered eggs in shallow water. They need wet potholes and ponds to breed their eggs and to keep their skin moist which helps them breath.

Salamanders live on insect larvae, worms, frogs and smaller salamanders.



CLAMS

Clams are an important addition important to the entire ecosystem. They are filter feeders. Clams filter two liters of water in an hour and keep the water clean. Some clams, like the Purple Wartyback Clam recently found in the Flambeau River, live eighty years.

Chapter 4 - WINGED CREATURES - INSECTS AND BIRDS

Vocabulary:

bugs	-	nya?tekatsi?nu•wáke
mosquito	-	okalyahtá•ne?
tick	-	oséhtu
cricket	-	slíkslik
horsefly	-	onla•kok
spider	-	tsyona?tsyakéhtu
butterfly	-	kana•w^
birds	-	nya?tejatsu?t^gskaje
redwing blackbird	-	kaskalí
duck	-	talu?kó
goose	-	káhuk
heron	-	oha•kwalute?
eagle	-	atú•nyute?
hawk	-	kalhakúha?

Wetlands are home for many different kinds of birds, large and small. The swamps and marshes are also home to many varieties of insects. A trip to a wetland will prove this.

The bugs feast on the wide variety of plants and the birds find a rich supply of food eating the bugs and sometimes small fish.

Many birds feed on marsh plants as well as insects. Ducks have special strainers on the bills that filter out food from the muddy water.

Duck highways used by mallards and other waterfowl are called "flyways". These are selected wetlands used for nesting places and rest stops during migration. Oneida has many excellent examples of flyways which attract many species.

There is a variety of ducks that make their homes in this area. The American Black Duck, the Green-winged Teal, the Wood Duck, Gadwall, Northern Pintail and Mallard are a few to be found in this area. Others stop over during their migration each year.

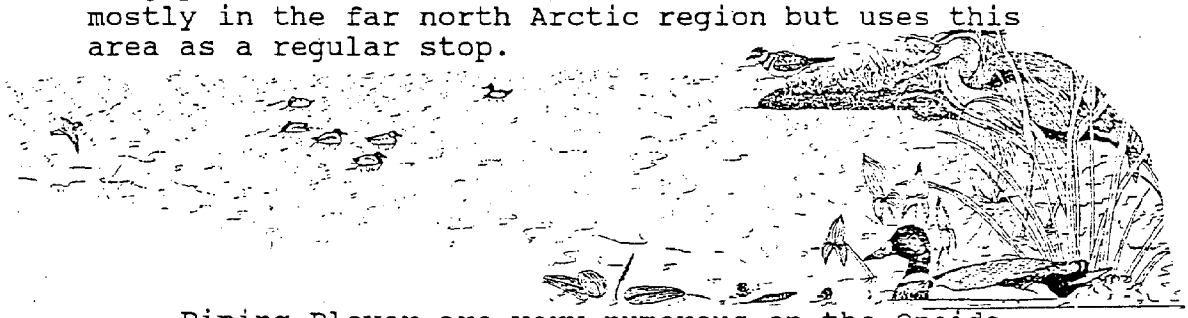
The male Mallard is easy to recognize. It has a green head with a white collar around his neck, a brown breast and a grey body. The female or hen Mallard is drab in color and is camouflaged to look like dried grasses.

Another bird that is easy to identify is the red-winged Blackbird. These smaller birds live their entire life in the wetland, building nests out of the rough grass and reeds.

The Great Blue Heron is one of the largest wetland birds in this area and can be found by lakes, ponds, rivers and marshes. The heron can usually be seen standing at the end of the water watching for fish or frogs to eat. Sometimes they will dine on snakes and even mammals.

The Night Heron can be found in the Oneida wetlands. It is shorter than the Great Blue and has a short neck. It has a distinctive voice that sounds like a barking "quawk!". As its name suggests, this bird is active at night and usually roosts in the daytime.

The Sandhill Crane is another large bird that has been seen on the Oneida Reservation. It can have a wingspread of 80 inches. The Sandhill Crane breeds mostly in the far north Arctic region but uses this area as a regular stop.



Piping Plover are very numerous on the Oneida wetlands. They can be seen even in drainage ditches where wetlands once were. These little birds make nests on the ground. Their eggs look like pebbles. The Piping Plover is an endangered species and cannot survive without the wetlands.

Some birds, such as the eagle, have diminished in numbers and are threatened or endangered. Wetlands provide a safe breeding ground for them. Without wetlands they could be lost forever.

INSECTS AND SPIDERS

How many different kinds of insects and spiders have you seen in a wetland? Which ones have you seen skimming across the water, holding onto leaves or flying?

Insects and spiders are among the most numerous animals on Mother Earth. Some are tiny predators. Wetlands are important breeding grounds for many species either in or near the water. Insects can lay their larvae in water or on leaves and plant material.

In wetland areas you can find many different kinds of waterbugs, beetles, flies, mosquitos, spiders, mites, butterflies and moths. Wetland insects can be as big as a three inch water bug or as small as a deer tick, the size of grain of black sand.

Indian people have always told stories about these creatures. Their small size does not diminish their importance. Each creature has a purpose and a job in keeping the balance of nature.

Chapter 5 - FOUR LEGGEDS

Vocabulary:

bear	-	ohkwalí
beaver	-	tsyoníhtu
muskrat	-	anó·ki
raccoon	-	^ti·lú
deer	-	osk^nu·tú·
otter	-	tawi·né

BEAVER

Beavers are very large rodents and are very important to wetlands. They help by building dams to hold water back which floods areas. These dome houses made may be three feet high and as much as nine feet wide.

Their lodges have one or more underwater entrances. Beavers spread wood chips on their floor to absorb excess moisture. Their favorite construction materials are poplar, aspen, willow, birch and maple.

In some places humans destroy beaver dams to keep a stream flowing, not allowing the area to flood. Usually this is only a temporary solution because beavers will rebuild each time.

MUSKRAT

Muskrats are also rodents, a member of the rat family. They live by small streams in wetland areas. Like the beaver, they have flat tails. Webbed hind feet and the flat tail helps them to swim.

Muskrats are excellent swimmers and spend most of the time in the water. They prefer slow moving water and avoid strong currents and rocky areas. They build large complicated burrows with underwater entrances. They eat wetland vegetation. When too many muskrat inhabit an area and over harvest the food sources, they move out as a whole family.

RACCOON

Raccoons are grayish mammals with bushy tails and hands-like fleet. They have broad faces with marking that give them the appearance of wearing a mask. Raccoons like to live in wetland area and eat frogs, reptiles, fruits and nuts. They often build their homes in hollow trees.

Raccoons are nocturnal which means they usually sleep during the day and are active at night.

OTTER

The river otter is another animal found in stream areas. The fur of the otter was often used in trading. It is still valued by Indian people and is used on traditional dance outfits.

The otter has a long body and is dark brown in color. When wet, the otter looks black. Its belly is a lighter color and it has whitish whiskers. Unlike beavers and raccoons, otters are active during the day unless disturbed by humans.

DEER

White-tailed Deer like to live near farmlands, in brushy areas near swamps. They are tan or reddish brown in the summer and turn grayish brown in the winter. Deer are usually nocturnal but may be active at other times.

Deer like to graze on green plants, nuts, berries, corn and plants growing in the wetland waters. Deer often come to marshes to graze. Whitetails snort through their noses to signal danger to the other deer in the area.

Deer meat has always been a primary source of food for Indian people. The hides are used for clothing. Deer hoofs are used as jingles on dance outfits. Every part of the deer is used.

BLACK BEAR

Black Bear range in size from 4 1/2 feet to 6 1/4 feet long. They have broad footprints 4 to 5 inches on the fore feet. Hindprints are 7 - 9 inches long and 5 inches wide.

Bears prefer to live in forests and swamps. Although usually nocturnal, bears have sometimes been seen during the day feeding at dumps. They often appear to be moving slow but bears can run up to thirty miles per hour. They are powerful swimmers and can climb trees for protection or to get food.

Chapter 6 - PLANTS AND LAND USE

Vocabulary:

grass (hay)	-	onékli
cowslips	-	yulo?uhkwa?ke´lha?
waterlily	-	yotsi?tsyake´lha?
rice	-	watn^?^•´kwas
elderberry	-	ala•sék
blueberry	-	otstókhwi
smartweed	-	yotskalatkó

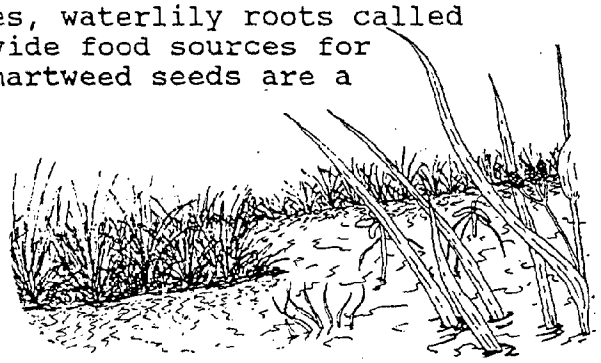
Wetlands can sometimes be identified because of the kinds of plants that grow there. Plants that can grow in water are called aquatic of hydrophytic vegetation. All of the wetland plants hold the soil in place with their roots and keep the water from washing the land away.

Wetlands can often be spotted by tall grass-like plants. Probably the one that you recognize most often is the cattail. The cattail is a kind of sedge. There are 113 different kinds of sedge in Wisconsin. There are fifteen different kinds of cattail. The cattail is a favorite to many of birds. Native people used the cattail for food and taught the early settlers how to grind the roots into meal.

Arrowhead is another plant that is easy to spot. There are six different kinds of Arrowhead but they all have a distinctive leaf shaped like an arrow. One type has leaves as much as 16 inches across. The plant grows from wet muck and provides food for ducks and muskrats. Sometimes this plant is called "Duck Potato".

Wild rice was another aquatic plant that provided food for the Indian people. Rice is considered an annual which means it will only grow for one season and must be reseeded. Some of the ripe rice must be dropped into the water for next year's crop. Some bands of Ojibwa still harvest rice every year and they are careful to let some of the rice fall back into the water.

Elderberries, blueberries, waterlily roots called tubers, and cowslips all provide food sources for animals, birds and humans. Smartweed seeds are a favorite of ducks and geese.



Chapter 7 - PROTECTING WETLANDS

Vocabulary:

water	-	aw^·ke
wetland	-	kana•waku
marsh	-	oh‿sa?k^•taku
swamp	-	a?so·laku
mud	-	onawa?tsta·ke
pond	-	wehkway^
riverbank	-	atsyakta

Wetlands provide a special kind of place for plants and animals. Wetlands provide a collecting place for rain and help control flood waters. They act like giant sponges and are able to hold great amounts of water. Then, these areas release the water slowly over time.

Wetlands help clean polluted water. Because water moves slowly in a wetland, the pollutants settle out. The plants absorb certain nutrients and chemicals that could cause serious pollution downstream. The dirty water becomes clean.

Certain birds, insects, snakes, and other animals find that wetlands are the most perfect place to live. They can find all the rich tasty food they need to survive. Some endangered species are found in the wetlands that remain. About 35% of all plants and animals listed as threatened or endangered in the United States either live in wetlands or need the wetlands in some way. If wetlands are destroyed, these plants and animals will be lost forever.

People still like to live on the edge of lakes, ponds, rivers and streams. Some people still fill in the land so they can build in these places. Farmers still fill or drain wetlands to increase their crops or grazing land. Some people still do not realize the importance of wetlands for all of us.

The Oneida Tribe has a law known as the "Shoreland Protection Ordinance" which protects the wetlands from destruction. There are three main threats to our wetlands here - agriculture, land use, and pollution.

We all need to work together to find ways to protect wetlands.

Chapter 8 - WE GIVE THANKS

Vocabulary:

Tvyethinuhwela:tu yukinulha ohutsya:ke -
We give thanks to Mother Earth

Tvyethinuhwela:tu ohne:kanua -
We give thanks to the water

Tvyethinuhwela:tu kaluhtehsuha -
We give thanks to the trees

Tvyethinuhwela:tu onekli'shu:ha
We give thanks to the grasses

Tvyethinuhwela:tu kutili -
We give thanks to the animals

Tvyethinuhwela:tu otshvhahshuha -
We give thanks to the birds

Tvyethinuhwela:tu kana waku -
We give thanks to the wetland

PROTECTORS OF THE LAND

By now you have come to realize that wetlands are important for the survival of our Mother Earth. We are grateful for the variety of places we have been given. Humans, animals, fish, birds, insects and plant life all rely on wetlands to keep our world in balance.

The Creator was very wise to make some places dry and others wet. The Creator knew which plants would hold the soil in place. The right foods were put in place. The families of animals complemented each other.

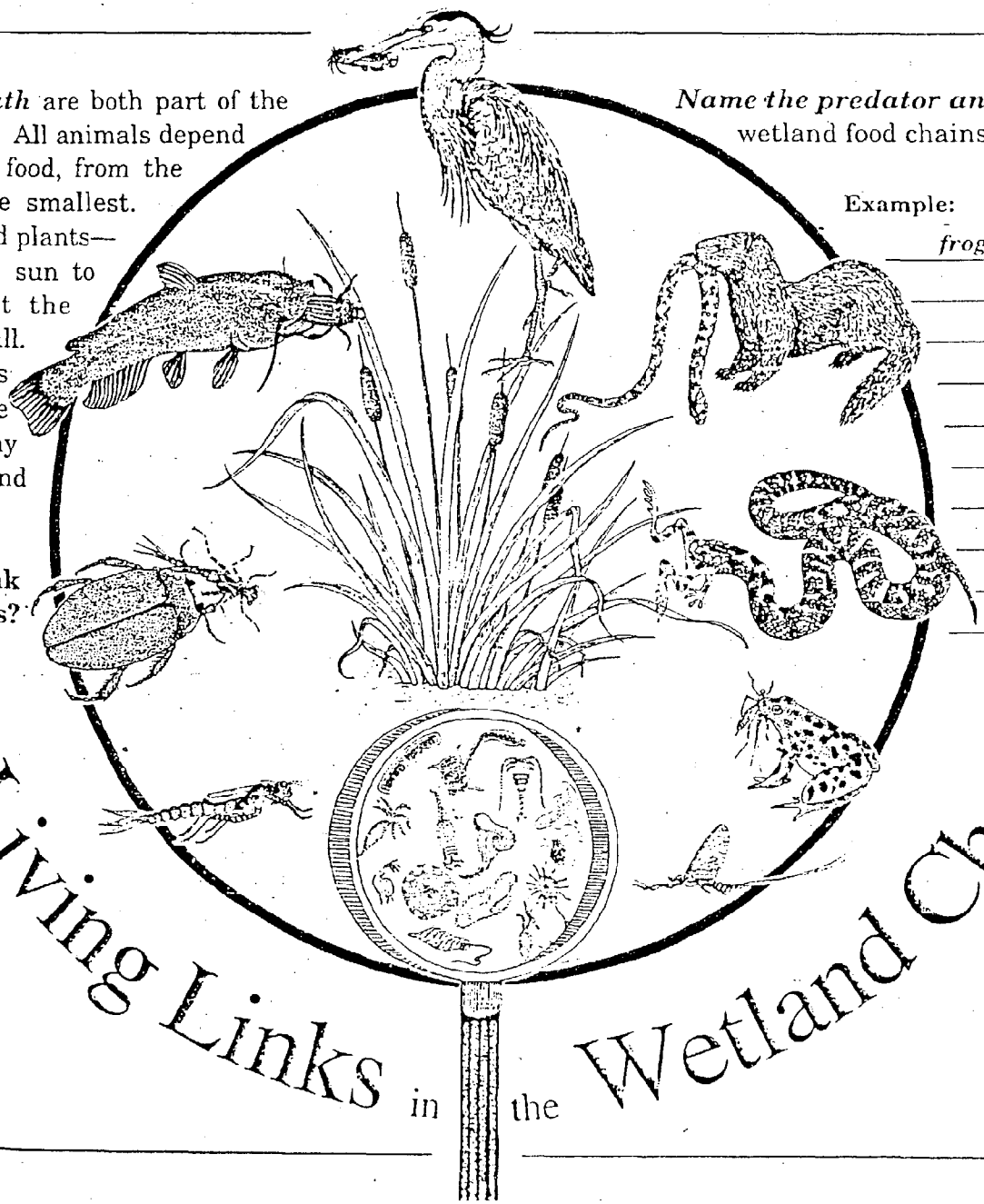
Humans sometimes forget about the balance and see a need for more farm lands, or want to build a house in a place not good for a house. Sometime we dump our garbage or factories dump their waste products in a wetland thinking "no one lives there".

When we offer tobacco and give thanks for all we have been given, we must also ask to know the right way to treat the wetlands and all who live there. Then we must have the courage to become protectors of the land.

Living Links in the Wetland Chain

Life and death are both part of the wetland cycle. All animals depend on others for food, from the largest to the smallest. Green wetland plants—capturing the sun to grow—are at the center of it all. The food chains illustrated here are two of many possible wetland food chains.

Can you think of any others?



Name the predator and the prey in each link of these wetland food chains.

Example:

frog eats *insect (mayfly)*

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

Wildlife Whatzits

Many animals have special **adaptations** that allow them to live in their habitat. An example is the flat tail of the muskrat which serves as a rudder (for steering) while swimming. Match the following wetland adaptations with the drawings:

A. Featherless extra skin to help paddle through the water. ( )

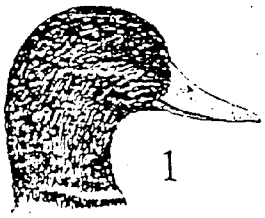
B. Keeps this animal from sinking in the mud while looking for fish, snails, frogs, or other things to eat. ( )

C. Propels this animal through the water and helps in grooming its fur. ( )

D. Used for sifting water and mud to strain out bits of food. ( )

E. Long, slim, strong, and pointed to reach into the water and catch or skewer fish and frogs. ( )

F. Strong, chisel-like teeth for cutting trees and brush. ( )



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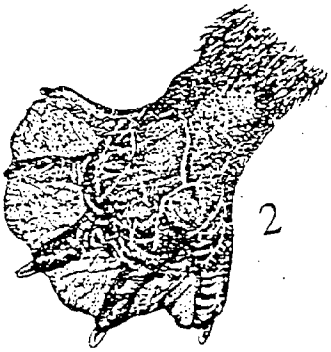

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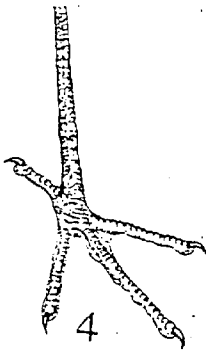

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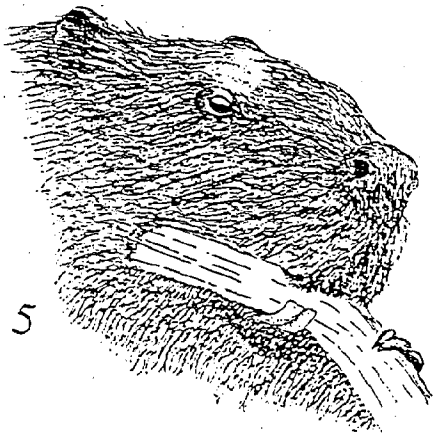

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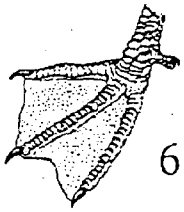

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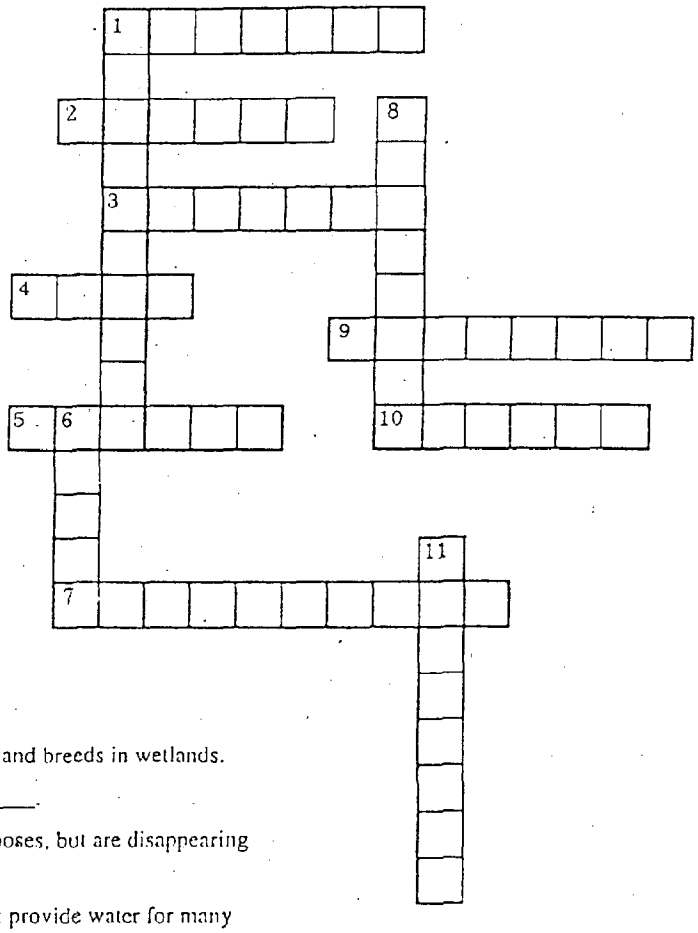
Wetlands Crossword Puzzle



Across

1) Pothole wetlands serve as natural _____, holding excess water and increasing soil moisture.

2) The duck highway often used by mallards is a _____.

3) This animal has such a big appetite, it eats its own home from the inside out.

4) These sleek predators have special glands that give off strong smells.

5) The nest of the piping plover.

7) Animals that may become extinct if something is not done to save them.

9) Wetlands hold water, release it slowly thereby helping to prevent _____.

10) Even young black bullheads can defend themselves because of these.

Down

1) This carnivorous amphibian lives in upland areas and breeds in wetlands.

6) Life and death are both part of the wetland _____.

8) These numerous, small wetlands serve many purposes, but are disappearing rapidly.

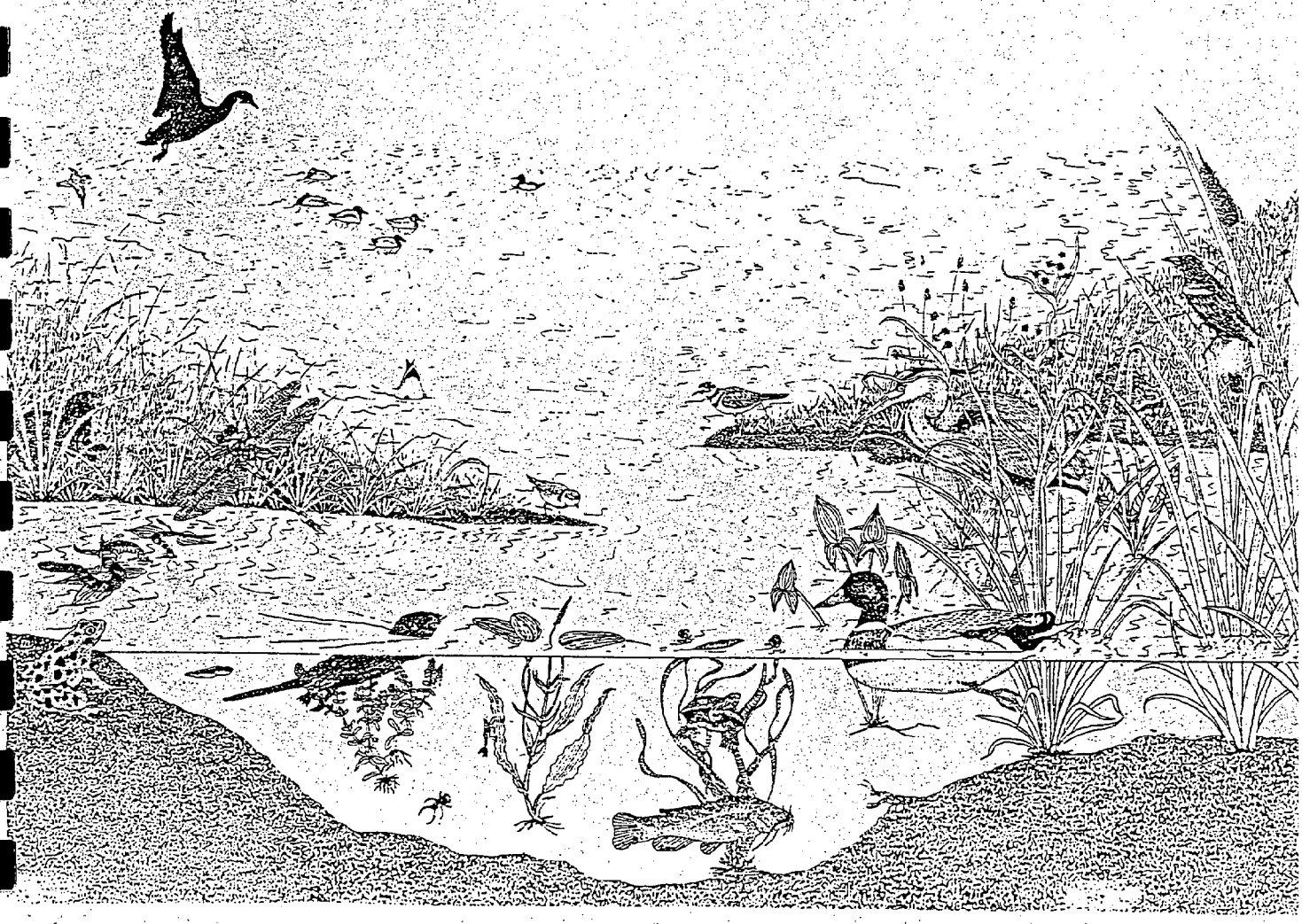
11) Wetlands _____ groundwater systems that provide water for many rural and urban people.

Answers

Across	9) flooding
1) sponges	10) spines
2) flyway	**Down**
3) muskrat	1) salamander
4) mink	6) cycle
5) scrape	8) potholes
7) endangered	11) recharge

Kana-waKu

Teachers' Guide



ACKNOWLEDGEMENTS

This curriculum was funded by a grant from the Wisconsin Coastal Management Program. Assistance was provided by Kathleen Kalina, Acting Director of the Oneida Tribe Environmental Department, Artley Skenandore, Principal of the Oneida Tribal School, Mike King and Terry Metoxen, Oneida Tribal Conservation Wardens, the Oneida Tribe Conservation Club, and Cliff Abbott of the University of Wisconsin-Green Bay. Materials were obtained from a variety of sources. Among them were the Madison Metropolitan School District and the Wisconsin Department of Natural Resources in Madison. The D.N.R. provided a good deal of the information. U.S. Fish and Wildlife provided the majority of graphics used in these lessons.

Most of all, thanks must be given to the Mother Earth in the words of the Iroquois people.

> We give thanks and greetings to the earth; she gives us that which makes us strong and healthy. She supports our feet as we walk upon her... We are her color, her flesh and her roots. Once we acknowledge and respect her role, then begins a true relationship and all that is from her returns to her.
>
> (Thanksgiving address of the North American Indian, North American Travelling College, 1976)

TEACHER'S GUIDE

ONEIDA WETLANDS

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OBJECTIVES

1. To help students identify and develop an awareness of wetlands, particularly on the Oneida Reservation.

2. To help students develop an awareness of the diversity of organisms that inhabit or use a wetland.

3. To help students understand the Indian ecological perspective and benefits to the environment.

4. To help students understand the value and function of wetlands as well as the consequences of wetland loss.

5. To help students to begin to evaluate the need for protection policies and management of areas and the effect of those policies, including the "hard" choices to be made.

6. To help students develop an understanding of the interconnectedness of all life and have reverence for that life.

7. To help students gain knowledge and skills to evaluate their own attitudes and lifestyles and that of their own family, friends and community members in order to maintain the integrity of wetland ecosystems.

8. To help students appreciate and understand the words spoken to the Creator in the Thanksgiving Address.

TEACHER'S GUIDE

Chapter One - INTRODUCTION TO WETLANDS

Vocabulary:

a?so'•laku	-	swamp
kana•waku	-	wetland
ohsa?k^•taku	-	marsh
onawa?tsta'•ke	-	mud

Activities:

Models

Students could be encouraged to build models of the different ways in which wetlands develop. This would involve their obtaining impervious soils (or synthetic barriers could be used) to simulate the natural environments. Discussion of topography would lead into map skill development.

Map Reading

This unit could benefit from the application of topographic map reading, with particular attention to the Oneida reservation. Other maps with distinct wetland distribution could be used for comparisons.

* * * *

Chapter Two - CHANGES IN THE LAND

Vocabulary:

Oneida	-	oneyote?a•ka	- people of the standing stone
Oneida, WI	-	okwehowé•ne	- an Oneida settlement

Chapter Two brings a historical perspective into the study of wetlands. Students should know a good deal of this information by this level. The material can be used to foster discussions of the changes that have taken place as a result of immigrants into this area.

This is a good unit to develop the "cause and effect" of culture change. Increased population results in a greater need for food sources which in

turn leads to the need for more land to be cleared for farming. This results in an increased loss of wetlands.

The historical component is not intended to place "blame" but to reinforce that people in earlier times did what was necessary for survival. At that time, they did not foresee the long range consequences.

Activities:

Make maps indicating the route that the Oneida People of Wisconsin took from New York State.

Use an early map of Wisconsin to show the area ceded from the Menominee to the Oneida and the reduction of acreage.

Discuss and show on a map the effect of the Dawes Allotment Act of 1887.

Make your own slides of landscapes showing the vast acres in use for farming vs wooded areas.

* * * *

Chapter Three - REPTILES, AMPHIBIANS AND FISH

Vocabulary:

snake	-	ótku, awistáni, or kwa?wátkwal
turtle	-	a?no•wále?
frog	-	kwale•lé
fish	-	nya?tek^tsyake
minnows	-	okála

Activities:

Have students make up Bingo Cards with the different species found in wetlands on the Oneida Reservation. This can be used is a number of ways including direct observation on field trips.

Other units in Biology can be integrated into this material.

Bruchac's Iroquois Stories (1985) has some excellent stories that would fit well into this unit. The "Three Tales About Turtle" could help develop an appreciation for the wetland environment. "Raccoon and

the Crayfish" is another story with wetland characters. There are also a number of stories in this book that have snake characters.

* * * *

Chapter Four - WINGED CREATURES - INSECTS AND BIRDS

Vocabulary:

bugs	-	nya?tekatsi?nu•wáke
mosquito	-	okalyahtá•ne?
tick	-	oséhtu
cricket	-	slíkslik
horsefly	-	onla•kók
spider	-	tsyona?tsyakéhtu
butterfly	-	kana•wʌ́
birds	-	nya?tejatsu?tʌ́gskaje
redwing blackbird	-	kaskalí
duck	-	talu?kó
goose	-	káhuk
heron	-	ohá•kwalute?
eagle	-	atú•nyute?
hawk	-	kalhakúha?

Activities:

Birdwatching or insect counting could be a way to illustrate the vast variety of birds and insects found in wetlands. The statistics of such a count could be used to identify wetland areas and comparisons between areas used to develop analyses of target areas.

This exercise could also be done with fictitious numbers and hypotheses formulated.

Create a mini wetland terrarium and raise insects.

The Audubon Society's nature guide Wetlands is a valuable resource to expand on the vast numbers of species that inhabit wetlands. The volume includes habitat areas. Some species are not listed as inhabiting this area but have been seen. An example is the Sand Hill Crane.

The Piping Plover can be easily recognized and have interesting habits. Many regional chapters of the Audubon Society sponsor "Save the Plover" programs. Additional information can be obtained from Audubon.

How many species can your students identify? Check to see if they are listed for this area or if they are outside of what is considered their geographic area.

* * * *

Chapter Five - FOUR LEGGEDS

Vocabulary:

bear	-	ohkwalí
beaver	-	tsyoníhtu
muskrat	-	anó•ki
raccoon	-	^ti•lú
deer	-	osk^nu•tú
otter	-	tawi•né
bear	-	ohkwalí

Activities:

Describe the eating habits of the mammals that live in wetlands. Show how the environment is essential for the survival of these species. Explain how loss of even some of this environment threatens the survival of these species.

Perhaps some of the students have pelts that could be brought into the classroom for display. Connect these exhibit pieces with a review of the fur trade and the impact on the culture.

The Iroquois people have honored the bear in many stories. The collection of bear stories gathered from informants in 1939 through the WPA project would be good additional material in this chapter. This booklet is not listed in the Bibliography because it is untitled, not dated and there is no editor listed. It is probably available through the tribal library.

Members of the Bear Clan could visit class to discuss this clan's contribution to the community.

* * * *

Chapter Six - PLANTS AND LAND USE

Vocabulary:

grass (hay)	-	onékli?
cowslips	-	yulo?uhkwa?ke´lha?
water lily	-	yotsi?tsyake´lha?
rice	-	watn^?^´•kwas
elderberry	-	ala•sék
blueberry	-	otstókhwi
smartweed	-	yotskalatkó

Activities:

Wetland plants can often be spotted from a distance. There are many more than the few mentioned in this chapter. A field trip to a wetland area could provide an opportunity for the students to see the diversity of hydrophytic vegetation.

Many wetland plants are used by humans. All are used by the other creatures. Plan a program to see how the plants and which part of the plants are utilized.

Bring in some uncooked wild rice and perhaps a "tasty" dish for students to sample. Many parents have wild rice recipes. Have the students put together a Wetland Plant Cookbook.

Have the students use some of the reeds for basketweaving or have a demonstration from a member of the community.

* * * *

Chapter 7 - PROTECTING WETLANDS

Vocabulary:

water	-	aw^´•ke
wetland	-	kana•wáku
marsh	-	oh‿sa?k^•táku
swamp	-	a?só•laku
mud	-	onawa?tstá•ke
pond	-	wéhkway^
riverbank	-	atsyákta

Activities:

Get a copy of the Oneida "Shoreland-Wetland Protection Ordinance" so the students can understand the policy established by the Tribe.

Have the students develop questionnaires to ask their family and friends. From the results students will be able to assess how much the general community understands about wetlands. This can be used to determine the need for wetland restoration, a plan of action for wetland protection and/or restoration, and the benefits to the community.

The results of this survey could form the basis for a community education program that is planned for Oneida and could help diminish the loss of wetlands in the area.

Students could be actively involved in the education of other people in the community as well as presentations to the lower elementary grades. By taking an active role, students will be empowered to become leaders in wetland protection and perhaps save some species.

* * * *

Chapter 8 - <u>WE GIVE THANKS</u>

Vocabulary:

Tvyethinuhwela:tu yukinulha ohutsya:ke -
We give thanks to Mother Earth

Tvyethinuhwela:tu ohne:kanua -
We give thanks to the water

Tvyethinuhwela:tu kaluhtehsuha -
We give thanks to the trees

Tvyethinuhwela:tu onekli'shu:ha
We give thanks to the grasses

Tvyethinuhwela:tu kutili -
We give thanks to the animals

Tvyethinuhwela:tu otshvhahshuha -
We give thanks to the birds

Tvyethinuhwela:tu kana waku -
We give thanks to the wetland

Activities:

Have a Longhouse Faithkeeper from each clan come to the class to offer tobacco and Thanksgiving for all that the students have learned.

KEY TO PRONUNCIATION

Vowels:

a	as in ah or father
e	as in egg or eight
i	as in ski or machine
o	as in hope or low
u	as in tune
^	as in s<u>on</u> or f<u>un</u>

Consonants:

h	as in hill (a breath sound)
k	as in skill or ski (actually closer to a 'g' sound)
l	as in like or Bill
n	as in nice or fan
s	as in soap or pass
	as in is or easy (actually closer to a 'z' sound only if it is between two vowels)
t	as in stove or still (actually close to a 'd' sound)
w	as in wave or sow
y	as in you
?	is a catch, a quick stop of air as between the syllables in 'uhuh' (slang for no)
/	marks the syllable with the stress or accent (loudest)
.	marks a vowel that is dragged a little (when a dragged vowel also has the accent mark then that syllable has a slightly falling tone)

<u>An Oneida Nature Glossary</u>
1977, Oneida Language Project

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OTHER RESOURCES

* John H. Braastad, Wildlife Biologist, specializes in Wetland Restoration, U.S. Fish and Wildlife Service, Green Bay Field Office, 1015 Challenger Court, Green Bay, WI 54311, (414) 433-3803.

John has given a presentation at Oneida and was very knowledgeable and had a good deal of supplementary materials. Some of this was used to supplement this curriculum. He would probably be willing to give a presentation at the school.

* Oneida Conservation Officers, Mike King and Terry Metoxen, are charged with the implementation of the conservation laws. These officers will be able to suggest wetland areas suitable for class field trips.

The Oneida Conservation Club is very active in wetland protection. The students and their families could be encouraged to join the club.

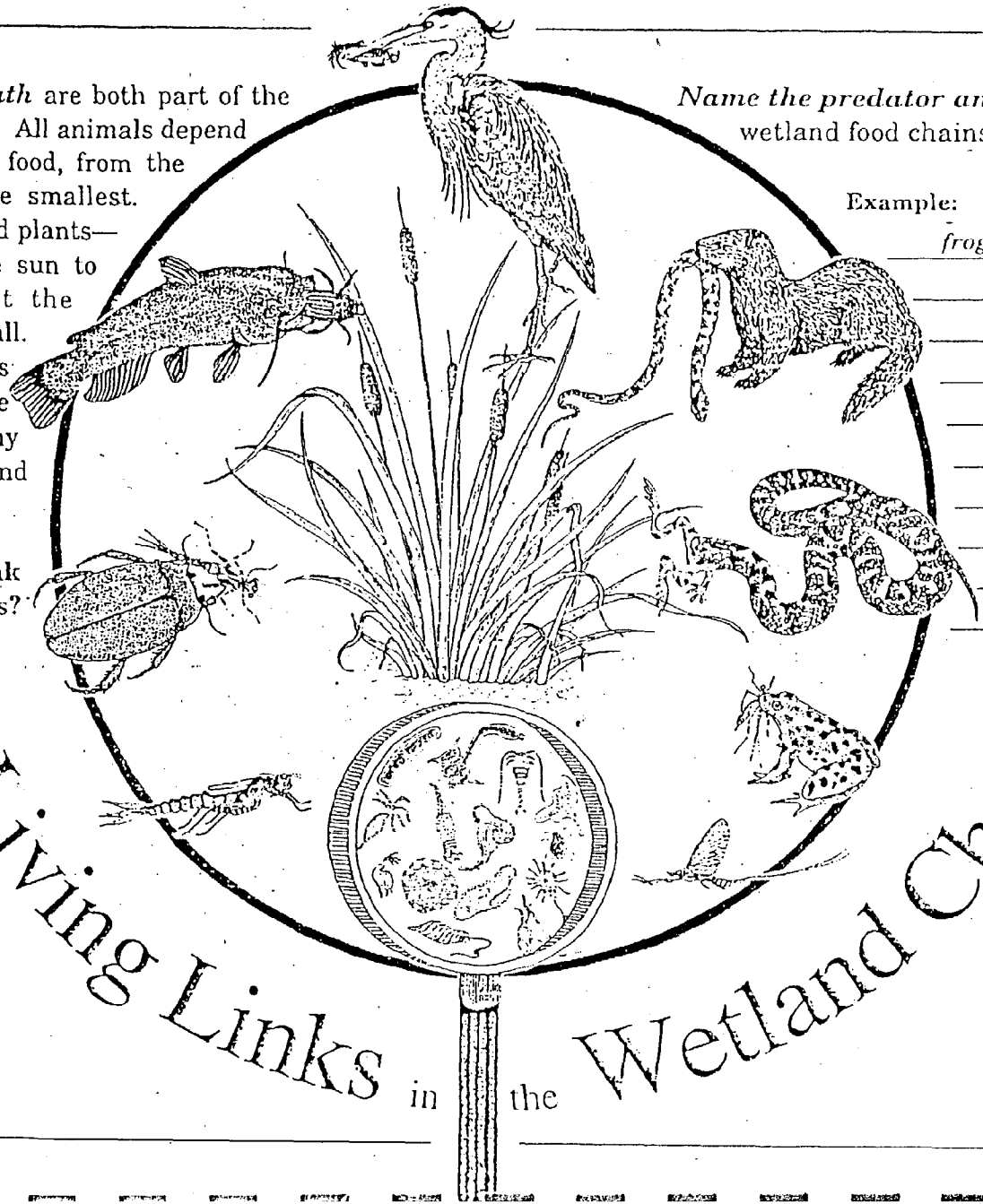
* Kathleen Kalina of the Environmental Department is a skilled educator and would be able to give presentations on any of the areas covered from an environmental protection perspective. The reservation has a number of environmental problems that threatens the integrity of the wetlands. Kathleen would be able to address some of these problems for your class.

* Carol Nepton, author of this curriculum guide, can be reached at the University of Wisconsin-Green Bay.

Living Links in the Wetland Chain

Life and death are both part of the wetland cycle. All animals depend on others for food, from the largest to the smallest. Green wetland plants—capturing the sun to grow—are at the center of it all. The food chains illustrated here are two of many possible wetland food chains.

Can you think of any others?



Name the predator and the prey in each link of these wetland food chains.

Example:

frog eats *insect (mayfly)*

_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

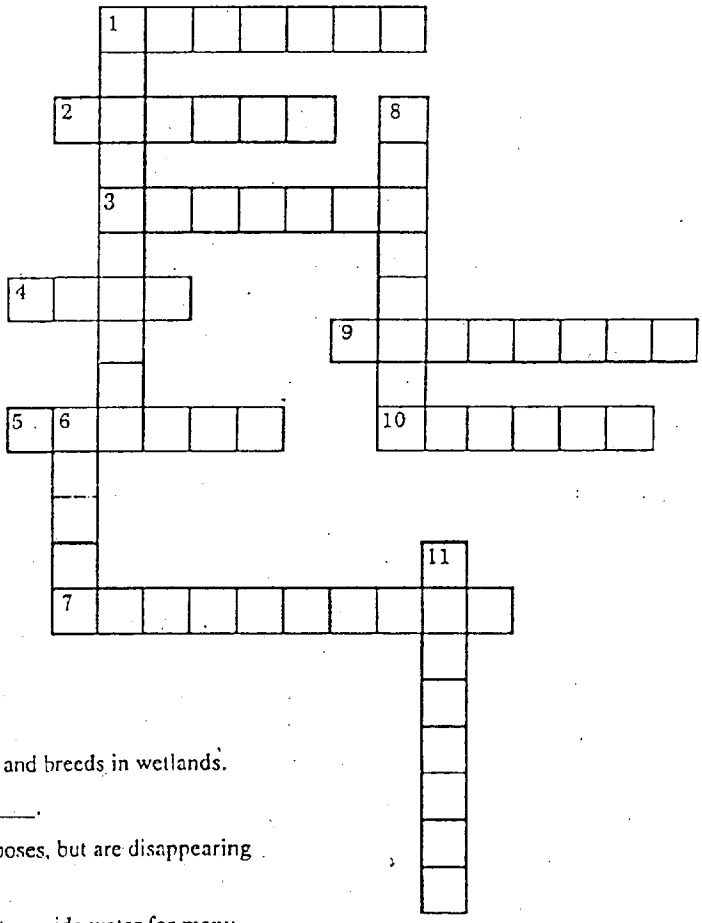
_____ eats _____

_____ eats _____

_____ eats _____

_____ eats _____

Wetlands Crossword Puzzle



Across

1) Pothole wetlands serve as natural _____, holding excess water and increasing soil moisture.

2) The duck highway often used by mallards is a _____.

3) This animal has such a big appetite, it eats its own home from the inside out.

4) These sleek predators have special glands that give off strong smells.

5) The nest of the piping plover.

7) Animals that may become extinct if something is not done to save them.

9) Wetlands hold water, release it slowly thereby helping to prevent _____.

10) Even young black bullheads can defend themselves because of these.

Down

1) This carnivorous amphibian lives in upland areas and breeds in wetlands.

6) Life and death are both part of the wetland _____.

8) These numerous, small wetlands serve many purposes, but are disappearing rapidly.

11) Wetlands _____ groundwater systems that provide water for many rural and urban people.

Answers

Across	9) flooding
1) sponges	10) spines
2) flyway	Down
3) muskrat	1) salamander
4) mink	6) cycle
5) scrape	8) potholes
7) endangered	11) recharge

Wildlife Whatzits

Many animals have special **adaptations** that allow them to live in their habitat. An example is the flat tail of the muskrat which serves as a rudder (for steering) while swimming. Match the following wetland adaptations with the drawings:

A. Featherless extra skin to help paddle through the water. ( )

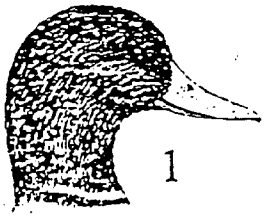
B. Keeps this animal from sinking in the mud while looking for fish, snails, frogs, or other things to eat. ( )

C. Propels this animal through the water and helps in grooming its fur. ( )

D. Used for sifting water and mud to strain out bits of food. ( )

E. Long, slim, strong, and pointed to reach into the water and catch or skewer fish and frogs. ( )

F. Strong, chisel-like teeth for cutting trees and brush. ( )



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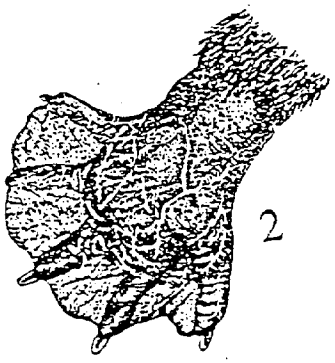

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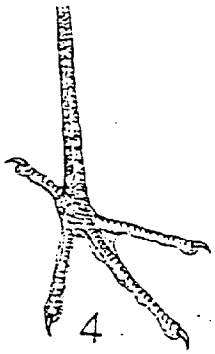

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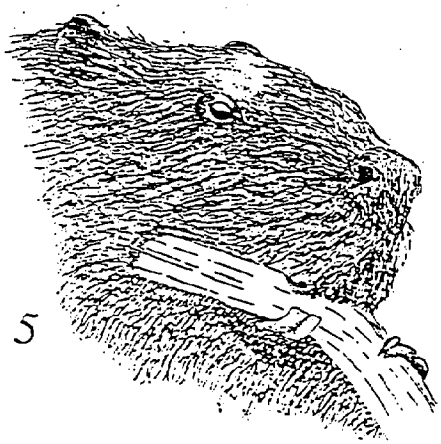

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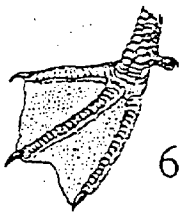

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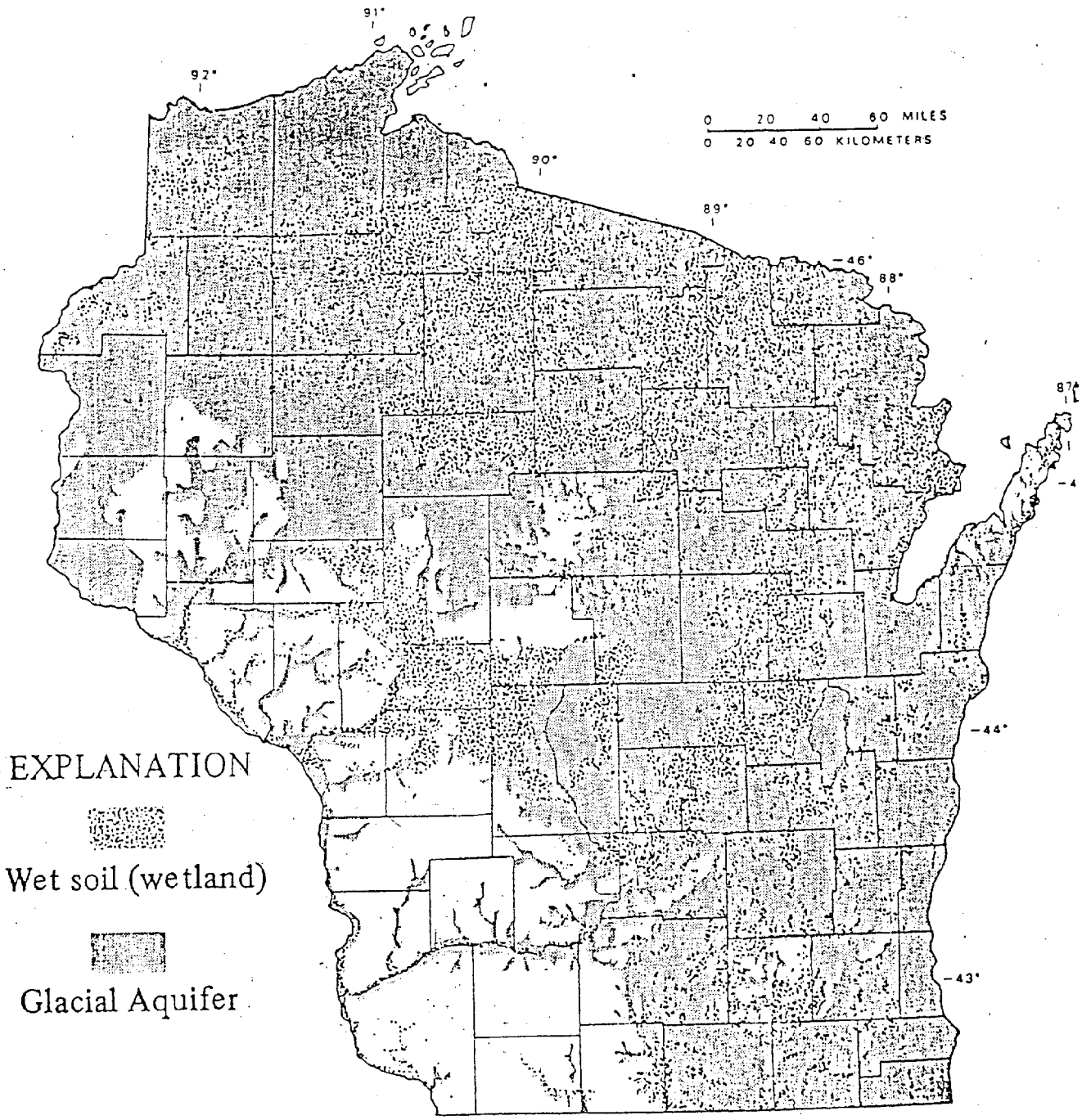


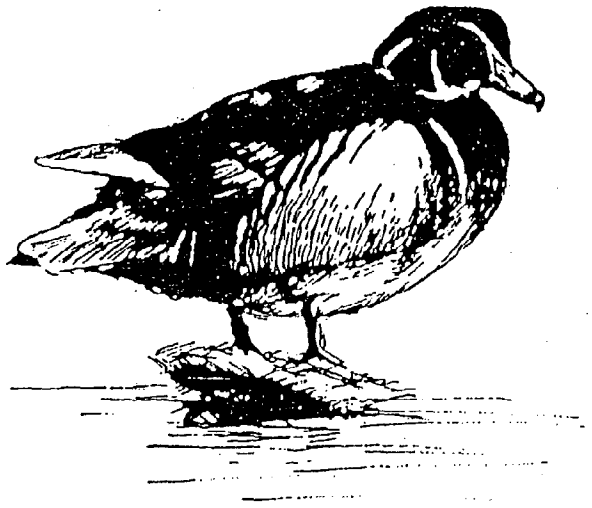
Wet soils map by B.E. Frazier and R.W. Kiefer, 1974. Limit of glacial aquifer from Devaul, 1975.

GLOSSARY

Wetlands

From: Wisconsin Natural Resources Council of State Agencies, *Managing Wisconsin's Natural Resources* (1973).

Wetlands—Land areas with shallow surface water and/or waterlogged soils during at least part of the growing season.



Wetland Classes

Adapted from: U.S. Fish and Wildlife Service Circular 39, *Wetlands of the United States* (1956).

Type 1 Seasonally flooded basin or flat—A type of wetland which is covered with water, or is waterlogged during some seasons but is usually well-drained during most of the growing season. Vegetation on this type of wetland is quite variable—ranging from bottomland hardwood forests to open meadows. This type of wetland may be found in an upland depression or in an overflowed bottomland.

Type 2 Fresh or Wet Meadow—A type of wetland which is not covered with standing water, but is waterlogged within a few inches of the surface during most of the growing season. Characteristic vegetation on this type of wetland includes grasses, sedges, rushes and various broad-leaved plants. Representative plants are sedges, rushes; redtop grass, reed grasses, manna grasses, prairie cordgrass, and mints. This type of wetland may occur in a shallow lake basin, slough, farmland sag or on the edge of a shallow marsh.

Type 3 Shallow Marsh—A type of wetland which is usually waterlogged during the growing season and often is covered by water six or more inches deep. Vegetation characteristic of this type of wetland includes grasses, sedges, bulrushes, burreed, spikerushes, cattails, arrowheads, pickerelweed and smartweeds. This type of wetland may occur in a shallow lake basin or slough, on the edge of a deep marsh, or as a seep area on irrigated land.

Type 4 Deep Marsh—A type of wetland which is covered with 6 inches to 3 feet or more of water during the growing season. Vegetation characteristic of this type of wetland includes cattails, bulrushes, spikerushes and wild rice. This type of wetland may occur in a shallow lake basin, a pothole, limestone sink, slough or on the edge of open water.

Type 5 Open Water—A type of wetland which is covered with three to ten feet of water and has emergent vegetation along its edges. Vegetation characteristic of this type of wetland includes pondweeds, waterlilies, wild celery, coontail and water milfoils. This type of wetland includes shallow ponds and reservoirs.

Type 6 Shrub Swamp—A type of wetland which is usually waterlogged during the growing season and which is often covered with as much as six inches of water. Vegetation characteristic of this type of wetland includes alders, willows, and dogwoods. This type of wetland may occur along a sluggish stream, on a floodplain, or on a disturbed wet meadow or shallow marsh.

Type 7 Wooded Swamp—A type of wetland which is waterlogged within a few inches of the surface during the growing season and which is often covered with as much as one foot of water. Trees characteristic of this type of wetland include American elm, silver maple, tamarack, white cedar, black spruce, balsam, red maple and black ash.

Type 8 Bog—A type of wetland on acid peat which is waterlogged. Vegetation characteristic of this type of wetland includes heath shrubs, sphagnum moss, sedges, black spruce and tamarack. This type of wetland may occur in a lake basin, along a sluggish stream, or on a watershed divide.

Soil Drainage Classes

Adapted from: U.S. Department of Agriculture Handbook No. 18, *Soil Survey Manual* (1951).

Very poorly drained soil—A type of soil from which water is removed so slowly that the water table remains at or on the surface the greater part of the time. This type of soil is usually found on a level or depressed site and is frequently covered by water.

Poorly drained soil—A type of soil from which water is removed so slowly that the soil remains wet for a large part of the time. The water table is commonly at or near the surface of this type of soil during a considerable part of the year.

Somewhat poorly drained soil—A type of soil from which the water is removed slowly enough to keep it wet for significant periods but not all of the time.

Other Wetland Terms

Adapted from: John T. Curtis, *Vegetation of Wisconsin* (The University of Wisconsin Press, 1959).

Fen—A unique type of wet grassland which occurs over a cold alkaline spring. Vegetation characteristic of this type of wetland includes grasses and sedges and rare plants such as grass of Parnassus, small white ladyslipper orchid, Kalm's lobelia, Riddell's goldenrod, rush-like aster, and the lesser fringed gentian. Fens usually occur on hillsides overlooking existing or extinct glacial lakes.

Lowland or Wet Prairie—A type of wet grassland which usually occurs on lowland subject to inundation by runoff from heavy rains or by floodwater from a nearby stream. Grasses characteristic of this type of wetland include big bluestem, bluejoint, sloughgrass, prairie muhly, and wild rye. Some of the most typical species of the lowland prairie are the New England aster, gayfeather, yellow stargrass, Turk's cap lily and prairie dock.

Northern Alder Thicket—A type of shrub swamp usually found in northern Wisconsin. The shrub which dominates this type of wetland is the tag alder. Like the southern shrub carr, the northern alder thicket usually covers only small areas but where bogs or sedge meadows have been disturbed, alders may cover a large area.

River Bottomland or Floodplain Forest—A type of seasonally flooded wet forest which is found along river valleys and on lake plains. In the southern part of the state, trees characteristic of this type of wetland include silver maple, American elm, black willow, cottonwood, swamp white oak, and green ash. In the northern part of the state, characteristic trees include white cedar and black ash.

Southern Shrub Carr—A type of shrub swamp found in southern Wisconsin. Shrubs characteristic of this wetland include red osier dogwood and several species of willows. Under natural conditions this type of wetland is usually a narrow band between a sedge meadow and lowland forest. However, more extensive shrub carrs have been created where sedge meadows, fens, or bogs have been altered by fire and/or water level changes.

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