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INTRODUCTION

As a Girl Scout, you have many opportunities to start hobbies that will enrich your daily life. Completing interest projects can be the first step along the way.

How Do You Begin?

Choose an interest project that is relevant to you – it should stimulate your imagination and curiosity. The U.S. Fish and Wildlife Service has created this booklet with four interest projects and award badges.



**National Wildlife
Refuges**



Endangered Species



Prairie Potholes



Prairies

Each interest project contains several activities that are organized into four categories: Skill Builders, Technology, Service Projects, and Career Exploration. By doing these activities, you will gain insight about yourself – your strengths and weaknesses, your likes and dislikes.

To earn an interest project award badge, you must complete at least seven activities as follows:

- Two Skill Builders Activities
- One Technology Activity
- One Service Project Activity
- One Career Exploration Activity
- Two activities from any category that you choose

For activities that involve contacting a national wildlife refuge, please utilize the contact information on page 24.

NATIONAL WILDLIFE REFUGES

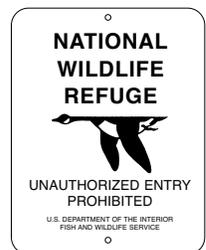
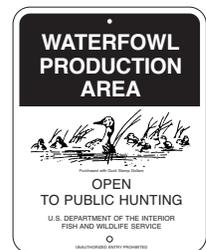
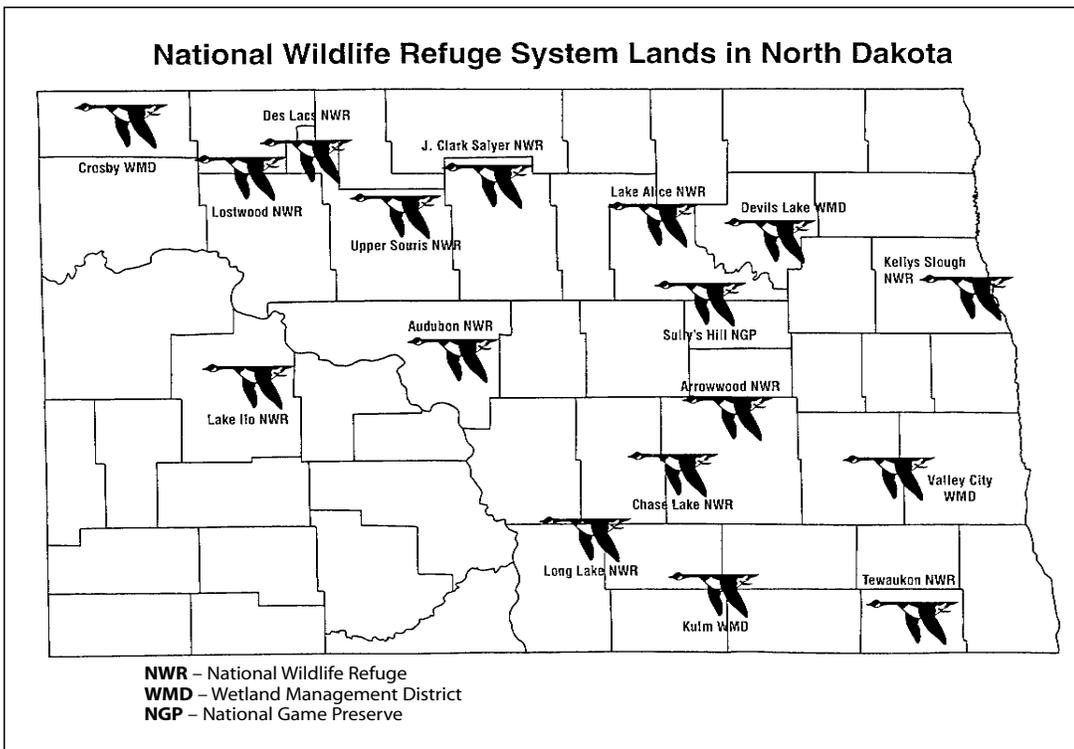


Wildlife habitat is found in very special places called national wildlife refuges, which are managed by the U.S. Fish & Wildlife Service. There are over 545 refuges throughout the United States, with at least one refuge in every state. On national wildlife refuges, wildlife comes first. Refuges protect important habitat for migratory birds, endangered species, sea animals, fish, butterflies, bison, and many more wildlife species.

Over 100 years ago, President Theodore Roosevelt, along with many other people, became concerned about the over-hunting of many of our country's beautiful birds – pelicans, egrets, and herons were being killed every day. President Roosevelt created the first national wildlife refuge in Florida in 1903. It was named Pelican Island National Wildlife Refuge, and it protected thousands of birds and their habitat. President Roosevelt went on to create 50 more refuges. He also helped establish laws to protect birds and animals from over-hunting.

North Dakota has 62 national wildlife refuges, more than any other state. People who work at refuges also take care of waterfowl production areas, which are lands for ducks and geese to raise their young on. These areas are found throughout North Dakota east of the Missouri River, and they are open to the public for birdwatching, hiking, wildlife observation, hunting, fishing, and more.

Habitat on North Dakota refuges is primarily prairie potholes (wetlands) and prairie (grasslands). A few refuges are along rivers and have wooded areas. J. Clark Salyer is the largest North Dakota Refuge with over 59,000 acres, and is located along the Souris River.



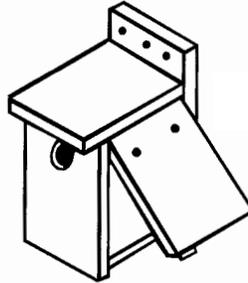


SKILL BUILDERS

1. Homes for Wildlife

Research the nesting habits of one of the birds listed below. You will find that these birds like to nest in cavities of trees, and will often move into a homemade nesting box if available.

- Tree swallow
- Eastern bluebird
- American kestrel
- Screech owl
- Wood duck
- House wren



Locate a nest box plan and ask an adult to cut the lumber for you. Nail or screw the box together and put it up in a habitat that is suitable for that bird.

2. Stepping Stones

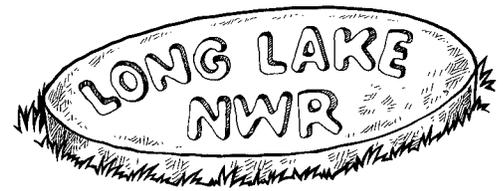
Many birds fly thousands of miles when they migrate between their summer breeding grounds and their winter resting areas. The blue-winged teal nests in North Dakota and flies 6,000 miles to the warm waters in South America. On this long journey, migrating birds need places to feed and stop for rest. National wildlife refuges are like stepping stones in a path, they offer a safe place to step. These refuges (or stepping stones) need to be located all along a bird's migration route to allow the bird plenty of places to rest and refuel with food.

Look on the U.S. Fish and Wildlife Service website and locate a map that shows our nation's national wildlife refuges.

- Go to <http://www.fws.gov>
- Click on "Refuges"
- Click on PDF Map showing location of all refuges

Create a Refuge Stepping stone:

- Use a plastic planter saucer for the mold
- Wear rubber gloves to protect your hands
- Purchase a bag of quick-setting concrete. Use a 5 gallon pail to mix the concrete with water, as directed on the bag. The mix is right when you make a hill in the concrete and slice the hill down the middle – if the sides cave in, the mix is too wet. Add more concrete.
- Pour the concrete into the mold and smooth with a stick.
- Use a popsicle stick to write the name of a national wildlife refuge in the wet concrete. Decorate by pushing stones, marbles, or colored glass into concrete.
- Let concrete set for 24-48 hours in a cool spot. Tip the concrete stepping stone out and place it in your backyard.



NATIONAL WILDLIFE REFUGES



3. The Blue Goose Flies High

Many countries, states and groups have symbols that represent themselves. For example, the bald eagle is America's national symbol and is used to represent freedom and strength. When national wildlife refuges were being created, a cartoonist named Jay "Ding" Darling drew a picture of a blue goose to raise awareness of the need to conserve birds by protecting the habitats in which they live. The symbol later became the symbol of the National Wildlife Refuge System. When you see the blue goose on a sign you know you are on a national wildlife refuge.

Develop a symbol or logo for a natural place near your home. Decide what makes your area special and what you want other people to know about your area. Create a banner or a sign that incorporates your symbol and name for the area. Hang for people to see.

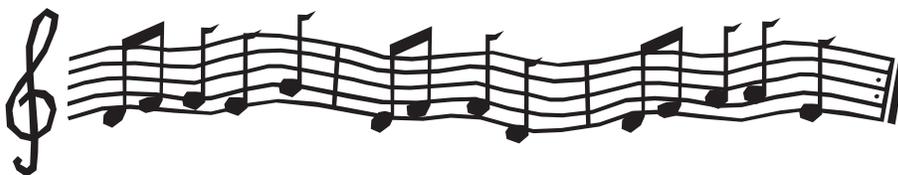


National Wildlife Refuge Sign

4. Bird Talk

There are many different kinds of birds that live on refuges. Many times you may hear a bird, but will not see it. Each bird has its own unique song and call. The difference between a song and a call is the length of time of the melody. If the melody is long and has many notes it is a song, if it is short and usually only one to two notes it is a call. Mourning doves have a soft coo song while the blue jay has a loud and boisterous song. Male birds sing to attract females and to communicate to other males that this is their territory. Females may call using clicks, clucks, and chirps to locate and communicate with their young. All birds have warning calls to alert others of danger.

Travel to a national wildlife refuge, park, or stay in your own backyard. Close your eyes, sit quietly, and listen to the birds sing. Use a small tape recorder to record the bird songs. Return home and play the tape – try to distinguish whether the bird is singing or calling and what they might be trying to communicate. Use bird song tapes, field guides, or CDs from the library to identify the birds you heard.

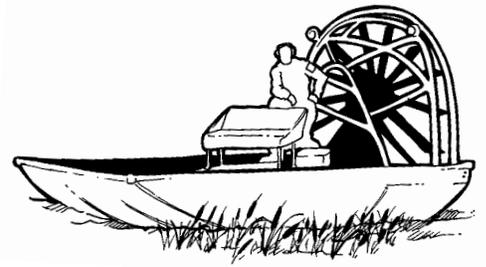




TECHNOLOGY

1. Difficult Problem - Creative Invention

What do you get when you cross a boat with a prop engine airplane? You get an airboat. These boats don't fly in the air but their large propeller in the back makes them "fly" across the water. In the 1940's, a biologist at the Bear River Migratory Bird Refuge in Utah, became frustrated while trying to count waterbirds and check water control structures on the Refuge's giant marsh. The marsh covered many square miles and the depth went from shallow (less than 12 inches in depth) to a thin film of water on mud. Regular boats could not travel across this marsh. The biologist contacted an aluminum boat builder in Utah to help design a new kind of boat. The result was an aluminum boat with a big prop and engine on the back. This boat could "fly" across the top of even the shallowest water at speeds up to 35 mph. Today, airboats are used on many refuges to access even the most shallow areas of a wetland.



Contact airboat companies and research what makes these large boats able to travel across the water.

What kinds of wildlife surveys and habitat management activities can be done with the use of an airboat?

2. An Oily Mess

Several national wildlife refuges lie along coastal areas. One of the most dangerous threats to the animals and plants that live in these areas are oil spills from off-shore oil rigs and oil tankers. Oil can cover the coastal wetland and shoreline plants, which kills them. Oil spills pollute the water and make it difficult for plants, fish, and other animals to survive.

Research the methods and technology that is used by scientists and companies to clean up these oily messes.

3. Fighting Weeds

Refuge managers are fighting a war against a group of plants that have invaded the prairies, wetlands, and woodlands of North Dakota. These weeds are introduced from other countries, and quickly out-compete our native plants. These invasive plants usually provide little or no value for wildlife as food or cover. These weeds are very difficult to control, and managers must use a variety of tools and techniques to reduce the weeds on national wildlife refuges.

Choose one of North Dakota's major weeds from the list (right) and research information about the plant. Create a list of tools and techniques that managers use to help control the plants. Extension: Create a PowerPoint presentation about your weed and give a program to younger scouts or to members of the community.





4. GPS Technology and Wildlife Management

What is GPS? GPS (Global Positioning System) is a navigation and precise-positioning tool developed by the Department of Defense in 1973. Originally, it was designed to assist soldiers and military vehicles, planes, and ships to accurately determine their location anywhere in the world. Today, the use of GPS has been expanded to include the scientific world. Wildlife managers use GPS technology to study plants, animals, and their habitats.

Using the Internet or other library resources, discover ways that wildlife managers are using GPS to study wildlife populations. Make a list of the different ways GPS is used across the world. Investigate some of the benefits and drawbacks of using this new technology to study wildlife.

What is GIS? GIS (Geographic Information System) is powerful graphic software that allows the user to create an extensive database. The development of a database allows the user to begin asking questions about the relationships that exist between different layers or types of data. Wildlife managers have many questions to answer about wildlife populations, their movements, where they are living, and how close they are to towns, roads, and rivers. GIS allows managers to look at larger questions across large areas of land to help them make decisions.

Using the Internet, go to the following sites to explore the different kinds of GIS information and maps that are available. Explore other GIS information sites that might interest you.

www.nd.gov/gis/

- Maps and Data
- Interactive Maps
- Start Hub Explorer

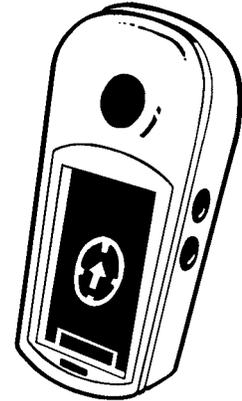
www.mbirdims.fws.gov/nbii/

See Bird Survey work done across the United States

<http://wetlandsfws.er.usgs.gov/>

Get a map of wetlands, lakes, rivers, and ponds in your state

- Go To Wetland Mapper
- Select what part of the country you want to work with



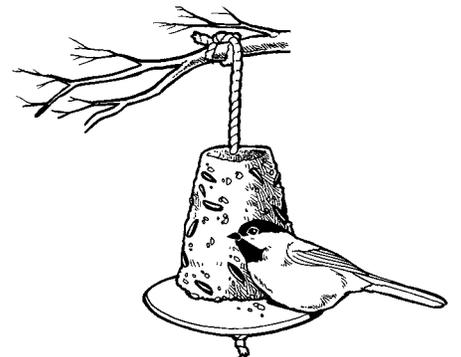
SERVICE PROJECTS

1. Neighborhood Refuge

The winter season can be an extremely difficult time for wildlife in North Dakota. Wildlife need a lot of high energy food to survive, and it is very hard to find food under deep snow or ice.

Read about common birds that are attracted to winter bird feeders. Purchase food appropriate for the birds you would like to attract. Hang bird feeders near your home, a nursing home, or neighbor's home, and fill and clean the feeders throughout the winter.

- American goldfinch
- Common redpoll
- House finch
- Purple finch
- Pine siskin
- Bluejay
- Black-capped chickadee
- Dark-eyed junco





2. North Dakota Butterfly Garden

Read about native wildflowers found in North Dakota. Select a spot in your backyard, school grounds, or city park to create a butterfly garden. Find plants that are native to North Dakota and plant them in your special garden. Build a butterfly house where butterflies can hide from birds, and put it on a post in your garden.



3. Raise Money for Habitat

A hunter must purchase a "Duck Stamp" each year to hunt ducks, geese, and swans. The money raised from the sale of these stamps is used to purchase wetlands and grasslands for birds that live there. Hundreds of special places including national wildlife refuges and waterfowl production areas in North Dakota were purchased with Duck Stamp money. Ducks and other wildlife need these areas to nest, raise their families, and to feed and rest during their long migration. Each year, a contest is held and one piece of artwork is chosen to appear on the stamp.

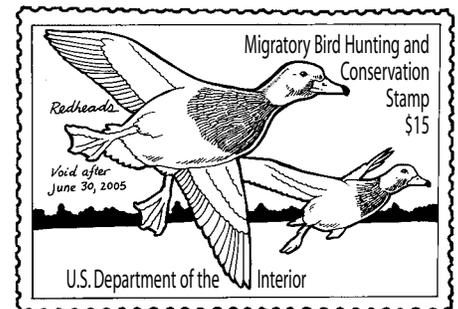
Begin a duck stamp collection! Visit your local post office and buy a "Duck Stamp" each year. Encourage your friends to do the same.

4. Conservation Through the Arts

The Junior Duck Stamp Contest is open to all youth from Kindergarten through grade 12. Find more information about the Junior Duck Stamp Contest. Visit <http://duckstamps.fws.gov> or contact the Tewaikon National Wildlife Refuge office at 701-724-3598. Follow the guidelines and paint, draw, or color a picture of a duck, goose, or swan. Send it to the Contest Coordinator before March 15th.

5. Adopt a Waterfowl Production Area

There are 242,000 acres of waterfowl production areas in North Dakota. Contact the manager of a national wildlife refuge or wetland management district office to discuss which waterfowl production areas are close to you and what wildlife projects could be done to enhance the habitat on that area. Contact other volunteers to help you do projects on the area.



NATIONAL WILDLIFE REFUGES



CAREER EXPLORATION

1. People of the Past - Saving for the Future

Over 100 years ago, concerned citizens of this country became alarmed at the slaughter of thousands of birds, and the use of feathers as decorations on ladies hats. They stood up and spoke for laws to protect wild animals and their habitats. Because of these people and their efforts, national wildlife refuges were created, and more people began to support wildlife conservation.

Throughout history there were many people who helped create wildlife refuges and fought for conservation laws. Research one of the following people and write a bibliography highlighting their contribution to wildlife conservation and national wildlife refuges.

- Paul Kroegel
- J. Clark Salyer
- President Theodore Roosevelt
- Rachel Carson
- Jay Norwood "Ding" Darling
- Aldo Leopold



2. Who Works on a National Wildlife Refuge?

People who work on national wildlife refuges do many different jobs. Some manage wildlife habitat, some monitor or track wildlife, others run equipment to create habitat, while others educate young people about wildlife and habitat conservation.

Interview a national wildlife refuge employee about one of the jobs listed below. Find out what kind of education and experience it takes to have that job, what activities and programs are involved with the job, what the challenges of the job are, and why that person decided to work on a national wildlife refuge.

- Administrative Officer
- Private Lands Biologist
- Fire Technician
- Refuge Manager
- Maintenance and Equipment Operator
- Wildlife Biologist
- Outdoor Recreation Planner
- Wildlife Law Enforcement Officer

3. Women in Wildlife

For many years, wildlife management and conservation jobs were held mainly by men. Many times, the jobs involved extensive physical labor and long periods in the outdoors in primitive situations. One of the first female scientists in the U.S. Fish & Wildlife Service was a woman named Rachel Carson.

Today, there are many women doing many different jobs on national wildlife refuges. Women are managers, biologists, maintenance workers, wildlife law enforcement officers, and outdoor recreation planners.

Contact several national wildlife refuges in North Dakota and find out how many women work at the refuge. Interview one of the women to find out how she came to be interested in a wildlife profession.



NORTH DAKOTA'S ENDANGERED SPECIES



When an animal or a plant becomes an endangered species, it means that there are not many of that kind of animal or plant left. Animals and plants that become extinct are gone forever. Some examples of extinct animals are: the passenger pigeon and the dusky seaside sparrow. Worldwide, over 1,000 animals and plants are endangered, and as many as 10 species disappear from our planet every day.

There are more than 200 animals and plants in the United States that are endangered. The main reason that animals and plants become endangered is because habitat is destroyed. Other reasons may include pollution, and illegal killing of animals. Without good habitat, animals and plants do not have everything they need to live. Plants cannot walk on legs or fly to another place. Sometimes the habitat is gone or the remaining area is too small to provide a good home for an animal. At other times, habitats may be separated from each other and animals cannot reach them. For example, a black-footed ferret in Wyoming cannot travel to a prairie in North Dakota – it is too far.

In 1973, the United States government passed a law called the Endangered Species Act. This law protects plants and animals that have become very rare. It is now illegal to kill, bother, keep, or remove these protected animals and plants from the wild.

Animals can recover from being endangered. For example, the peregrine falcon was protected by the Endangered Species Act for many years. Wildlife biologists, land managers, landowners, and other groups of people have worked hard to protect these birds and their habitats. Now, peregrine falcon numbers have increased, and they are no longer considered an endangered species.



Black-footed ferret

NORTH DAKOTA'S ENDANGERED SPECIES



North Dakota's Endangered Species

Eight rare animals and plants either make their home in North Dakota, or use the habitat as a resting and feeding area during their long migration. These species are:

Whooping Crane (bird)

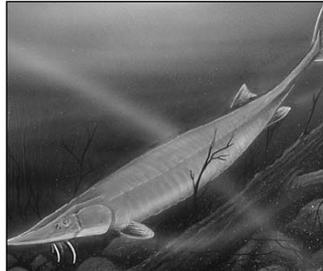
- Is the tallest bird in North America
- Needs wetlands to nest and find food
- Migrates through North Dakota in April and September



Whooping crane

Pallid Sturgeon (fish)

- Has lived since the time of dinosaurs
- Live in large rivers with strong currents
- Live in the Missouri River in North Dakota



Pallid sturgeon

Least Tern (bird)

- Is the smallest member of the gull family
- Nests on sandy beaches
- Lives along the Missouri and Yellowstone Rivers



Least tern

Black-footed Ferret (mammal)

- Has a long, slender body
- Is the rarest mammal in North America
- Used to live in prairie dog towns in western North Dakota



Black-footed ferret

Western Prairie-fringed Orchid (plant)

- A white flowering plant
- Blooms in early July in the tallgrass prairies of eastern North Dakota
- The largest population in the world is found in eastern North Dakota



Western prairie-fringed orchid

Bald Eagle (bird)

- The adult has a white head and tail
- Nests in large trees and eats fish and dead animals



Bald eagle

Gray Wolf (mammal)

- Can range in color from white to black to gray
- Pups are born in a den in the ground, rockpile or hollow log
- Most likely to be found in forested areas of North Dakota



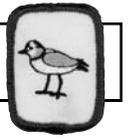
Gray wolf

Piping Plover (bird)

- Small bird that runs quickly across the ground
- Nests on bare, sandy shores of lakes and large rivers
- North Dakota's wetlands are very important nesting areas for piping plovers



Piping plover



SKILL BUILDERS

1. Before It Is Too Late

There are many kinds of plants and animals that may be placed on the endangered species list if we do not act fast. In North Dakota, these rare species with threatened habitats include:

- Dakota skipper (butterfly)
- Regal fritillary (butterfly)
- Sage grouse
- Burrowing owl
- Sprague's pipit
- Black-tailed prairie dog
- Long-eared myotis (bat)
- Smooth softshell turtle
- Three ridged mussel
- Elktoe mussel
- False map turtle
- Small white lady slipper (plant)
- Ladies tresses (plant)
- Short horned lizard

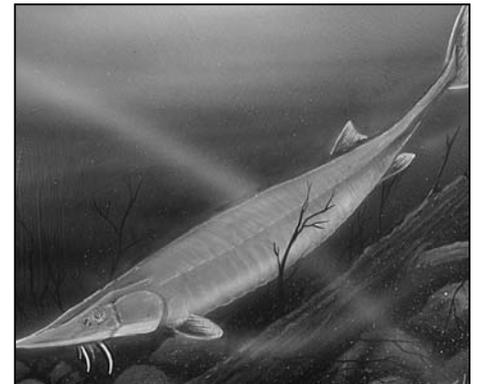
Research two animals or plants from this list and discover what they need for habitat and what the threats are to their survival. Develop a plan to keep them from becoming endangered.

2. I Saw A Dinosaur Swimming By ...

The pallid sturgeon is a fish that lives in the Missouri River. This species was around when dinosaurs roamed the earth. Pallid sturgeons are endangered because of changes people have made to the Missouri and Mississippi rivers.

Can pallid sturgeons survive in rivers that have been so drastically changed by people? What are some ways that people and sturgeons can co-exist on the Missouri River?

Research more about this extraordinary fish and use the information to develop a plan to help protect the pallid sturgeon.



Pallid sturgeon

3. Whatever Touches the Butterfly Touches Us

Chemicals used on lawns and crop fields can end up in streams, rivers, and wetlands. These chemicals can make wildlife sick or kill them. DDT was a pesticide used in the 1960s to control insects. The sprayed insects and chemical got into the water where fish lived. The fish ate the contaminated insects and became sick or died. Bald eagles ate the contaminated fish and died or were so sick that their egg shells were too thin and broke easily. Many people that lived in areas where DDT was used also became sick.

Read the label on a chemical that your family uses on trees or lawns. Discover how the chemical could affect plants and animals. Draw a map that shows how this chemical might get into a river, stream, wetland, or underground water supply.

4. Managing the Habitat

Land managers have to provide the right kind of habitat for a variety of wildlife species. Each species needs specific things in its habitat. Some need dead trees, others need large areas of grass. Some species

NORTH DAKOTA'S ENDANGERED SPECIES



need shallow wetlands, while still others live in a river. Managers use a variety of tools (planting grass or trees, fire, livestock grazing, mowing, and water management) to make the habitat suitable for a species. An example would be the western prairie-fringed orchid; managers use controlled fire, weed control, and livestock grazing to make the prairie suitable for the orchid.

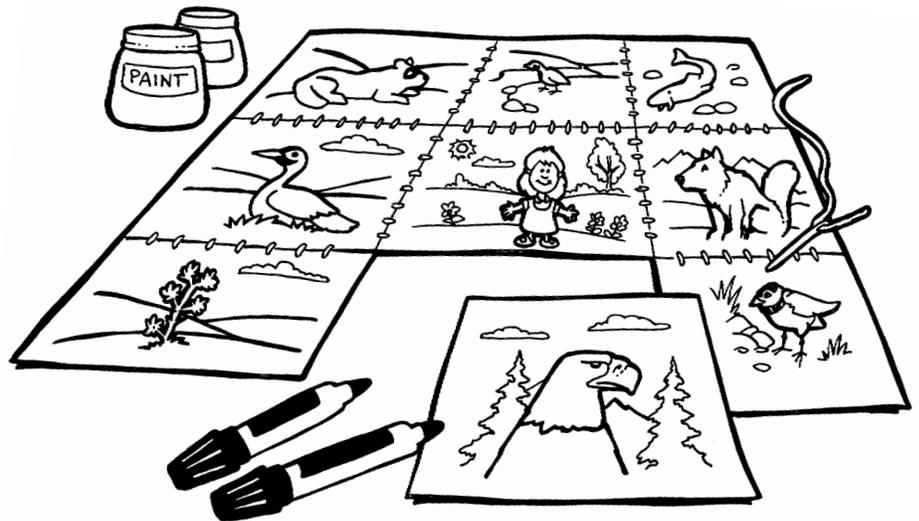
Research one of the endangered species found in North Dakota (see page 11), and learn about their habitat needs. Develop a management plan for an area near you for that species.

5. Sharing our World

There is only so much room on the earth. Wildlife and people both use the same space, food, and water. When something happens to wild animals and their habitat, we need to remember that the same thing could happen to us. When we poison our rivers and streams, the fish that live in the water could get sick or die. When we eat too many of these fish we can also get very sick. Think of the world as a giant quilt. Each square represents an animal, a plant, or person. We are all tied together by threads which connect us to each other. If one square is removed, the quilt does not function as well as when it was connected – it is not as beautiful or as warm. The same can happen with endangered species. What happens if we start removing animals from our earth?

Create an Endangered Species Quilt

- Take 9 blocks of plain colored cloth - all the same size
- Use fabric paints, iron on transfers, or sewn on pieces of fabric and put one of the eight North Dakota endangered species on each square
- Use fabric paints to draw a picture of yourself on the 9th square
- Sew the quilt together



TECHNOLOGY

1. Following Wildlife

Tracking the movement of an endangered species is very important if biologists are to understand what is happening to the species. It can also be very difficult. Many birds fly hundreds of miles during migration and mammals and fish can move many miles in a single day.

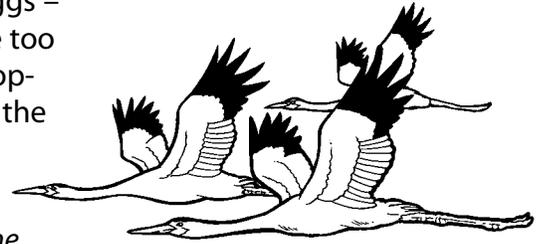
Make a list of tools and techniques that biologists use to follow, keep track of, and study birds, mammals, and fish.



2. Teaching Birds To Fly

Whooping crane populations were down to 21 individuals in 1944. Biologists began collecting eggs and, once hatched, raised the young birds in captivity. These birds were kept in captivity to lay more eggs – these eggs were to be returned to wild crane nests but there were too few wild whooping cranes left. In some areas, there were no whooping cranes left to show the young birds the migration routes from the nesting grounds to the wintering grounds.

Discover the ingenious ways biologists found to teach young birds how to survive and migrate. Write a short story about whooping crane management.



3. Wildlife Genetics

There were very few black-footed ferrets left when biologists captured them and brought them into captivity to be raised.

What are some of the genetic problems that biologists have to overcome in trying to restore a population of animals to greater numbers?

4. Solving Wildlife Crimes

Wildlife law enforcement officers solve crimes involving endangered species much like the crime scene investigators do for crimes against people. The U.S. Fish & Wildlife Service has the only laboratory devoted entirely to wildlife forensics. The Clark Bavin National Fish and Wildlife Forensics Laboratory is located in Ashland, Oregon.

Contact a U.S. Fish & Wildlife Service law enforcement officer or a game warden for the North Dakota Game & Fish Department to find:

- *What types of evidence they look for at the scene?*
- *What tools they use to gather evidence at the scene?*
- *What information is gathered to help build a case?*

Prepare a list of questions and then contact the forensics lab to discover what technology is being used to process samples and what questions they are trying to answer for law enforcement officers.



SERVICE PROJECTS

1. Can We Live Together?

Attend a city or county planning meeting that involves development of a natural area. Listen to the issues and help develop solutions.

2. Making a Difference

Volunteer your time on public lands! Public lands include national wildlife refuges, state parks, wildlife management areas, national fish hatcheries, and national grasslands.

NORTH DAKOTA'S ENDANGERED SPECIES



3. Let Your Voice Be Heard

Research one of the North Dakota endangered species and the issues facing that species. Write a letter or visit with State and Federal legislators or the Governor. Outline your concerns about conserving our endangered species and their habitats.

4. Doing Your Part

Inventory all the chemicals that you and your family use on your lawn and garden. Learn about alternative ways to control weeds and insects in your backyard without the use of chemicals.

CAREER EXPLORATION

The U. S. Fish & Wildlife Service is a federal government agency in charge of working with endangered species. There are many different careers that people can have that help rare wildlife: wildlife biology, fisheries biology, botany, land manager, law enforcement officer, or wildlife inspector.

1. Endangered Species Habitat

Providing suitable habitat for an endangered species is a complex task for land managers. Endangered species have specific habitat requirements that must be met for the species to survive.

Contact a land management agency or organization in North Dakota (U.S. Fish & Wildlife Service, U.S. Forest Service, North Dakota Game & Fish Department, Nature Conservancy) and arrange for an interview or job shadow. Explore the different tools and techniques managers use to create and maintain habitat for endangered species and other wildlife.

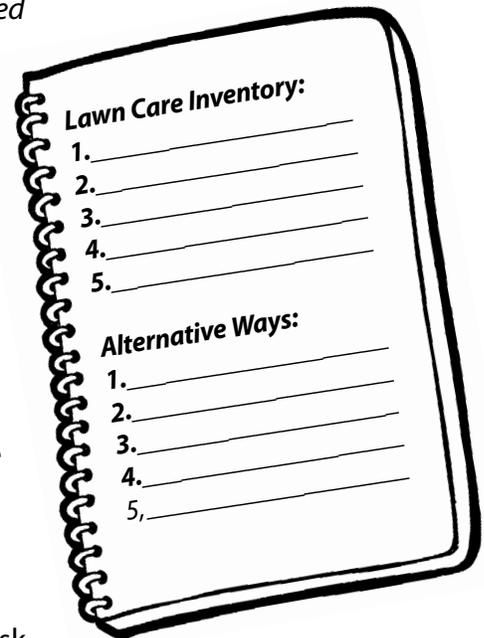
2. Protecting Wildlife

Game wardens and Federal law enforcement officers enforce the laws that are passed to protect wildlife from harm. These officers need to have a biological background, act as detectives, and they must be able to work well with the public.

Contact the staff at a North Dakota national wildlife refuge or the ND Game & Fish Department and arrange to visit with one of their law enforcement officers.

3. Zoos and Conservation

Zoos can help preserve endangered species and educate people about the value of protecting their habitat. Arrange a visit with a zoo staff member and discover how and what zoos are doing to help endangered species.



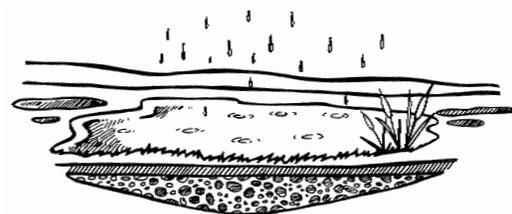
NORTH DAKOTA'S PRAIRIE POTHOLES



Prairie potholes are amazing places where water and land come together. Just like you may have one or more nick-names, people call prairie potholes by a variety of nick-names including wetlands, sloughs, ponds, lakes, and swamps. The water found in the potholes may come from rain-fall, melting snow, or natural underground springs. Just because they are called wetlands, it does not mean that they always hold water. The water level can change from season to season, and year to year. Some potholes hold water for only a couple of weeks in the spring, and others hold water all year long. There are times when wetlands can be completely dry.

Prairie Potholes

Over 10,000 years ago, part of North Dakota was covered by a huge glacier. As this huge chunk of ice melted and retreated, it left depressions, and piles of soil and rocks. The depressions filled with water, and were called potholes. The piles of soil and rock became the gently rolling hills. This landscape was later called the "Prairie Pothole Region," which spreads through parts of North and South Dakota, Minnesota, Montana, Iowa, and Canada. The many potholes of this region are very important to the millions of ducks, geese, shorebirds, and other kinds of wildlife that breed and raise their young here. They also provide important areas for birds to rest, eat, and refuel before they continue their long migration flights. Many scientists consider the prairie pothole region to be one of the most important wetland areas in the world.



SKILL BUILDERS

1. Prairie Pothole Photo

Temporary potholes are very shallow and fill with water from melting snow and early spring rains. These potholes are full of seeds and insects that provide lots of energy for birds. They usually dry up in just a few weeks and then may be planted to cropland.

Seasonal potholes usually hold water from early spring through July. Many insects provide food for young ducklings and shorebirds. These potholes are often filled with grasses that can be grazed or hayed when the pothole dries up.

Semi-permanent potholes usually hold water throughout the summer. Plants such as cattails and bulrush often grow around the edge of the pothole and provide nesting areas and valuable shelter for many kinds of wildlife. These potholes will go dry in years when there is very little rain and snowfall.

Permanent potholes usually hold water all year and are commonly called lakes. Geese and ducks often rest and fill up with food from these areas during their long migration. These potholes go dry only after several years of low rain and snowfall.

Visit a variety of prairie potholes and photograph a temporary, seasonal, semi-permanent, and permanent pothole. Create a scrapbook that focuses on the types of potholes ... add photos of birds or other wildlife that may be found in each type of pothole (these can be photos that you take with your camera, or photos cut from wildlife magazines or catalogs).



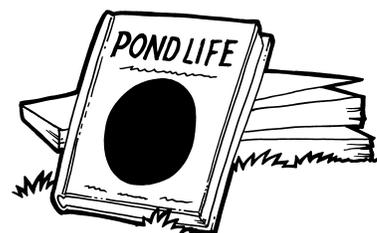
NORTH DAKOTA'S PRAIRIE POTHOLES



2. Prairie Pothole Insects Up Close!

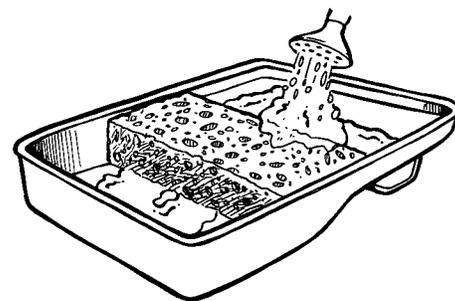
Take a close-up look at the water in a wetland. You can find an assortment of wetland insects and other small animals. These animals are food for ducks, frogs, turtles, fish, and other wetland wildlife. Some of these small creatures are predators – that means they eat other animals. Can you spot some bright red bodies swimming in the water? They are called water mites. These tiny creatures attack prey much larger than themselves, including insect larvae and aquatic worms. The mites attach themselves to their prey and suck out the body juices with their tiny, straw-like mouths.

1. Fill a magnifying jar with water from a wetland. Set it in a dry, level place.
2. Use a net to sweep through the water.
3. Transfer the insects to the magnifying jar using a tweezer or dropper.
4. Take a close-up look. Notice the claws, mouth parts, hairs, and other features that you could not see before.
5. Use a field guide to help identify the insects you find.
6. When you have finished looking at the aquatic life, carefully return the animals to the wetland.



3. Create a Model of a Prairie Pothole

1. Spread a layer of modeling clay in the upper half of a paint tray to represent land. Leave the lower half of the tray empty to represent a lake.
2. Shape the clay so that it gradually slopes down to the lake. Smooth the clay along the sides of the tray to seal the edges.
3. Cut a piece of sponge to completely fill the space across the tray along the edge of the clay. This represents a wetland buffer between dry land and the lake.
4. Slowly sprinkle some "rain" on the land, and observe and describe what happens. How does the wetland help slow the water that runs across the land? What happens to the excess water that cannot be stored by the wetland? What happens if you remove the wetland?
5. Sprinkle some soil over the clay and then make it rain. What happens to the soil as it rains? Where do most of the soil particles end up? How does the wetland help the lake water stay clean? What happens if you completely remove the wetland?



4. Making Tracks!

Have you ever forgotten to take your muddy shoes off and left a trail of footprints in your house? Wild animals often leave prints, or tracks, in the mud or sand around wetlands. Finding animal tracks is a great way to discover the different wildlife species using a wetland.

Take a walk around the wetland and locate a track.



NORTH DAKOTA'S PRAIRIE POTHOLES

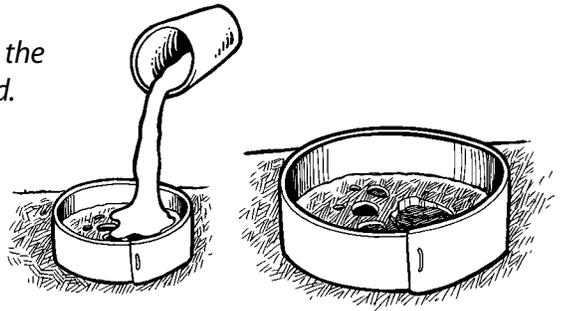


Make a track cast.

Materials needed:

plaster of paris, stirring stick, cardboard track ring, styrofoam cup

1. Look for a well-formed, deep track that has not been disturbed. Place the cardboard track ring around the track. Press the ring firmly into the mud.
2. Pour water into the plaster of paris to form a smooth paste. Do not get the mixture too runny.
3. Carefully pour the plaster mixture into the track until it is completely covered. The cardboard ring will keep the mixture in place. Let it set for 20-30 minutes.
4. Carefully remove the cardboard ring from the plaster cast. After it is completely dry, brush the soil off.



What animal made the track? _____

5. Exploring Prairie Potholes

Sit quietly near a pothole for 5 minutes. Use your senses to look ... listen ... touch ... smell. There are more things out there than meet the eye. Look for wildlife and plants, listen for subtle sounds, touch your surroundings, and discover what scents are in the air.

Use the table below to record your observations in the column under the sense that you used.

Look	Listen	Touch	Smell

TECHNOLOGY

1. Ancient Pictographs

Pictographs are pictures that ancient people used as a way to tell a story without words. Pictographs have been found in caves and other places. They help us understand what people did long before alphabets were invented. For example, if a person wanted to say that it was a nice day, and that while having a picnic under a tree they saw an eagle, they may draw a sun, tree, eagle, and a picnic basket.

Use a pencil and paper to make a pictograph of interactions you see in a prairie pothole. Maybe you notice a duck diving after a minnow, or some ducklings hiding in the plants near the shoreline. Think about how our technology has changed – make a list of methods that people use today to communicate with one another.



NORTH DAKOTA'S PRAIRIE POTHOLES



2. Mapping a Map

North Dakota highway maps are available at many visitor centers, rest areas, and gas stations. Locate a map and discover where the majority of the lakes are found in our state. A highlighter can be used to highlight major geographic features such as rivers and lakes.

In relation to the Missouri River, which areas have the largest concentration of lakes? Why does a certain area have more lakes?

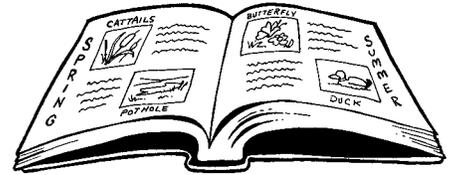
3. Using Binoculars

Many people who use binoculars do not use them correctly. Borrow or purchase a pair of binoculars. Read through the directions to learn about the two separate focusing pieces that can be adjusted to help you see better. Teach a group of girl scouts how to use binoculars to observe wildlife in or near a prairie pothole.



4. Photos Through the Seasons

Make one visit to a prairie pothole during each season. Use a digital or a 35mm camera to photograph the pothole, as well as plants and animals that can be seen there. Create a scrapbook that is divided into 4 sections – spring, summer, fall, winter. Place your photos under the appropriate section, and include a description of what the area looked like at the time of the photo. View the scrapbook when you are done – notice how the height and colors of plants change, how the water looks different shades of blue, and how different animals may be seen during different seasons.



SERVICE PROJECTS

1. Cleaning Up!

Organize a group of people to pick up trash along a pothole, stream, or river in your community. You can even clean up ditches that eventually drain into the potholes! Encourage helpers to separate recyclable products from trash. Contact your local newspaper to take photographs and write a story about your groups efforts.

2. Christmas Bird Count

There are many volunteers in North Dakota who are involved in "Christmas Bird Counts". This bird count is conducted sometime during December and January – local citizens that enjoy watching birds get together to count and identify birds in a specific area. Watch the newspaper for information on these counts – get together with a friend or adult who participates and join in the fun!

3. Wetland Awareness in School!

Write a column in your school newspaper that informs others about the importance of wetlands to wildlife and people. Write about your favorite plant or animal, how wetlands help reduce flooding, how plants help filter chemicals and fertilizers, or anything else that is great about wetlands.





4. Be Informed!

If you want something done about the way wetlands in your community are treated, you must be well-informed. Make a list of questions and find the answers. Questions may include but are not limited to: Whose job is it to protect wetlands? Why are wetlands important to people? Why are wetlands valuable to wildlife? What laws protect wetlands?

CAREER EXPLORATION

1. Wetland Work

Contact an agency or organization that works with wetland conservation (U.S. Fish and Wildlife Service, Natural Resource Conservation Service, North Dakota Game and Fish Department, or Ducks Unlimited, Inc.). Interview an employee and ask questions about the work they do with wetlands.

Examples of questions may include:

1. What types of wetlands do you work with?
2. What types of projects are done with wetlands?
3. Are projects conducted on public or private land?
4. How does the work you do benefit wildlife and people?

Ask to job shadow an employee that will be visiting a natural wetland, or a wetland that has been created or enhanced.



2. Researching Wetland Ecology

The Northern Prairie Wildlife Research Center in Jamestown, North Dakota has done extensive studies on North Dakota's wetlands, grasslands, and wildlife. The Center has many scientists that work to answer the many questions we have about how wetlands work, what the risks are for wildlife, and what lives in and needs wetlands. Contact the Center and arrange to interview a scientist working on a wetland project. If possible, spend a day in the field with them.

3. Wetland Education

You can be a teacher that teaches in the great outdoors, instead of in a school! There are people who are environmental educators and work at national wildlife refuges, other agencies, or private organizations. Work together with your school science teacher, and invite an environmental educator into your classroom to discuss their career, and how he or she teaches others about wetlands.

NORTH DAKOTA'S PRAIRIES



Prairie is the main habitat found in North Dakota. Prairie is made up of grasses, colorful wildflowers, and scattered shrubs (bushes). As early European settlers traveled across the vast expanse of prairie, they commented that it was like crossing “a sea of grass,” because the wind moved across the grass causing it to ripple like waves on an ocean. The settlers named this huge open country “prerie,” which means meadow or grassland. The spelling was later changed to “prairie.”

North Dakota has two kinds of prairie grasslands – the tallgrass prairie and the mixed grass prairie. Tallgrass prairie is found on the eastern edge of the state, and receives more precipitation than the mixed grass prairie in central and western North Dakota.



Skill Builders

1. Prairie Investigation

Visit a prairie – the prairie might be in your backyard, or land that a friend or relative owns. You can also find prairie on a national wildlife refuge, wildlife management area, or national grasslands. Using a piece of rope or yarn, mark out an area on the prairie approximately 5 feet in diameter. Thoroughly investigate, identify and record the grass and wildflower species, along with any animal signs you find within your circle. You'll need to bring along a variety of field guides to help you with the identification.

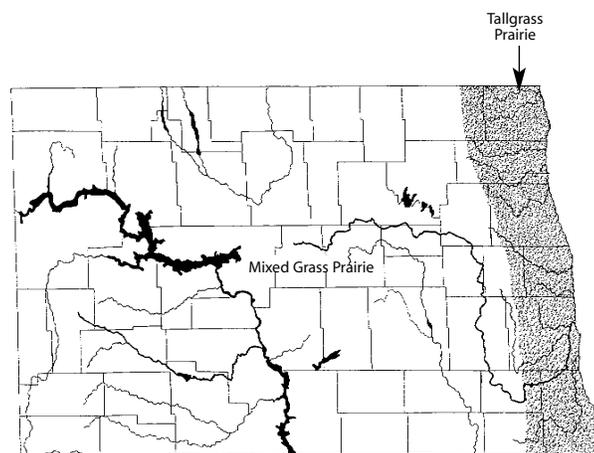
2. Flower Power T-shirts

With permission, collect some flowers of various colors.

Materials Needed:

- flowers
- rock (or hammer)
- pre-washed cotton t-shirt
- dye setting solution
(3 Tbsp. baking soda in 1 gallon water)
- brown paper bag
- waxed paper
- newspaper

1. Put several layers of newspapers (1-2 inches thick) inside the brown paper bag.
2. Place the brown paper bag inside the t-shirt so it lays flat.
3. Arrange flowers and leaves on the t-shirt.
4. Place a layer of waxed paper on top of the flowers and leaves (the order of your layers should be: waxed paper, flowers and leaves, front of t-shirt, brown paper bag with multiple layers of newspaper inside, back of t-shirt).
5. Using a rock or hammer, pound the front of your t-shirt until the colors from the flowers and leaves soak into the t-shirt. Pound carefully so you do not tear the fabric.
6. After you are done pounding, soak your t-shirt in the dye setting solution for 15 minutes.
7. Dry, then enjoy wearing your “Flower Power T-shirt”!



North Dakota Prairies

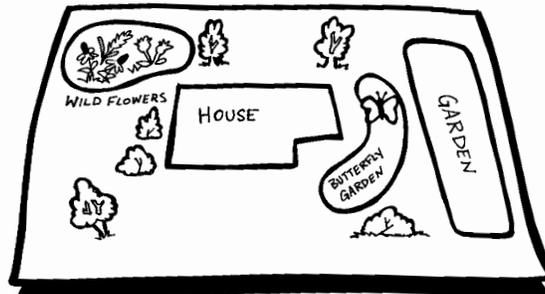


NORTH DAKOTA'S PRAIRIES



3. Plant a Prairie

1. Research the types of grasses and wildflowers found on native North Dakota prairie.
2. Find an area in your yard, garden, or even at your school that you can convert to a natural prairie habitat.
3. Sketch a plan of what you want to plant and the arrangement of how you want to plant it.
4. With permission, collect seeds from native plants. You'll have to do some research on techniques for getting your prairie started.



4. Song Map

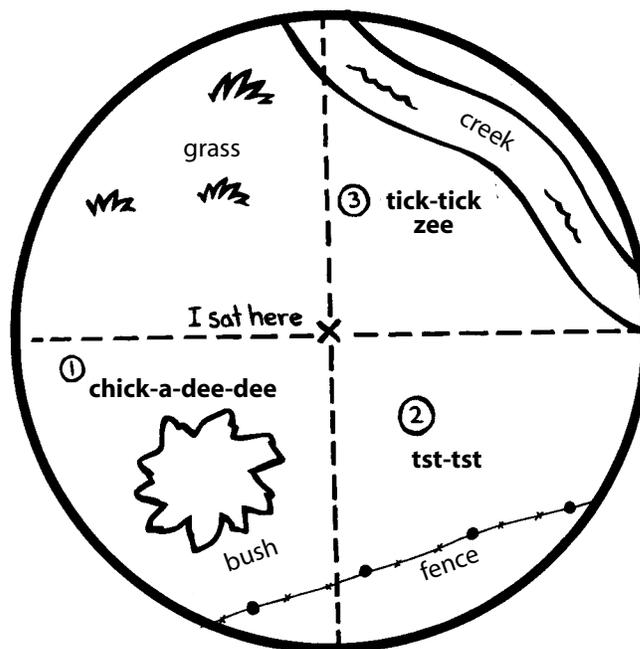
Some people might think that prairie grasslands are not important to birds because there are very few trees or bushes in this habitat. The fact is that there are many species of birds that breed, nest, and thrive in a prairie habitat.

Discover the variety of birds that live on the prairie by making a song map.

Materials Needed:

- sheet of paper
- clipboard
- pencil

1. Take a walk through the prairie, and find a quiet, comfortable place to sit.
2. On your paper, draw a large circle and incorporate your surrounding landmarks. (For example, a creek, bush, a large rock, and an X where you are sitting in relation to these objects.)
3. Sit and listen very carefully for the songs of different birds. As you hear the different songs, draw a dot on your map where you hear the song coming from.
4. Next to the dot, describe what the song sounds like. (For example, a robin sounds like "cheer-up cheerio").
5. After you have listened for 20 -30 minutes, count how many different songs you have heard.
6. Take your song map home and use a bird field guide to help you identify the birds on your map.
7. Research the function of bird song. Why do birds sing?
8. After you have identified one of the birds on your song map, find out how many different calls that particular bird has.



NORTH DAKOTA'S PRAIRIES



TECHNOLOGY

1. Plant Research

Using the United States Department of Agriculture (USDA) Plants Database (<http://plants.usda.gov>), find out which of the following plant species has been documented in at least 15 North Dakota counties:

- needle-and-thread
- blue grama
- big bluestem
- plains bristlegrass
- hairy grama
- sideoats grama
- buffalo grass
- green needlegrass
- sandbur
- orchard grass

2. The Role of Fire in an Ecosystem

Using the Internet, find out how and why fire plays an important role in the prairie grassland ecosystem.

3. Too Exotic!

List and describe at least 3 species of exotic plants that are invading the prairies of North Dakota.

4. The Sage-grouse

Describe what suitable habitat is for the greater sage-grouse, and where the habitat is found in North Dakota. What is the current population status of the greater sage-grouse?



SERVICE PROJECTS

1. Wildflower Gardening

Plant a native wildflower garden in your community, near your school, or in a park or zoo. Create a sign or a poster that identifies the wildflower species in the garden.

2. Beetles Galore

Leafy spurge is a noxious weed that invades native prairie. Leafy spurge beetles are used as an alternative to chemicals to help control this nasty invader. The beetles are collected in areas where they are thriving, and then re-located to new areas where leafy spurge is abundant. Contact your local Soil Conservation District office, or County Weed Board and volunteer to help collect leafy spurge beetles.

3. The Value of Prairie

Create a poster or exhibit that shows the values of the prairie for both people and wildlife. Display it at a local grocery store, school, or other place of business.

4. Prairie Walk

Organize a prairie walk – invite a school group, and/or members of the community. Take the participants on a walk through a prairie near your town. You can lead the walk yourself, or invite someone else to lead the group. Name the different types of wildflowers, grasses, birds, and other wildlife that live on the prairie.

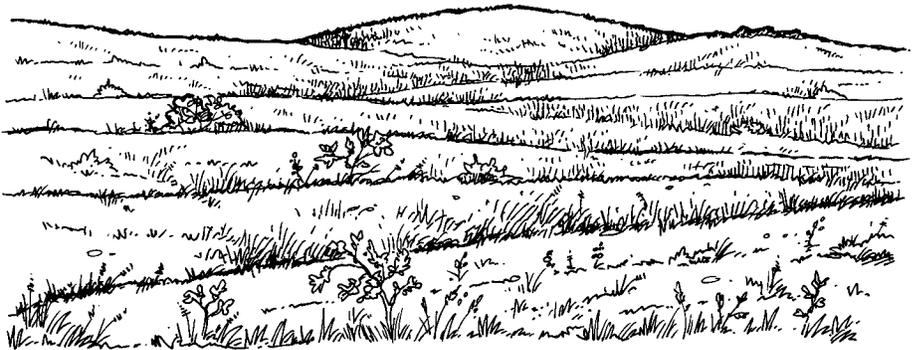


NORTH DAKOTA'S PRAIRIES



5. Presenting the Prairie

Create a PowerPoint presentation about North Dakota's prairie. Present it for a school group, or other organization to help people gain a better understanding of the prairie and its importance to both wildlife and people.



CAREER EXPLORATION

1. Who Does What?

Make a list of all the different agencies and organizations in North Dakota – include state, federal, and non-profit organizations whose missions involve working with prairie habitat. Describe the projects they are involved with.

2. Conducting an Interview

Interview a biologist from the Natural Resources Conservation Service (NRCS) and a national wildlife refuge. Make a list of what their duties are – describe the similarities and differences.

3. Being a Botanist

What is a botanist? Find out what agencies have botanists that work at their office. What do they do?

NATIONAL WILDLIFE REFUGES AND WETLAND MANAGEMENT DISTRICTS IN NORTH DAKOTA

Arrowwood NWR & WMD

7745 11th St. SE
Pingree, ND 58476
701-285-3341
<http://arrowwood.fws.gov>

Audubon NWR & WMD

3275 11th St. NW
Coleharbor, ND 58531
701-442-5474
<http://audubon.fws.gov>

Chase Lake NWR & WMD

5924 19th St. SE
Woodworth, ND 58496
701-752-4218
<http://chaselake.fws.gov>

Crosby WMD

PO Box 148, 206 Main St.
Crosby, ND 58730
701-965-6488
<http://crosbywetlands.fws.gov>

DesLacs NWR

Box 578
Kenmare, ND 58746
701-385-4046
<http://deslacs.fws.gov>

Devils Lake WMD

PO Box 908, 221 2nd St. NW
Devils Lake, ND 58301
701-662-8611
<http://devilslake.fws.gov>

J. Clark Salyer NWR & WMD

PO Box 66
Upham, ND 58789
701-768-2548
<http://jclarksalyer.fws.gov>

Kulm WMD

PO Box E, 1 First St. SW
Kulm, ND 58456
701-647-2866
<http://kulmwetlands.fws.gov>

Lake Ilo NWR

489 102 Ave. SW
Dunn Center, ND 58626
701-548-8110
<http://lakeilo.fws.gov>

Long Lake NWR & WMD

12000 353rd St. SE
Moffit, ND 58560
701-387-4397
<http://longlake.fws.gov>

Lostwood NWR & WMD

8315 Highway 8
Kenmare, ND 58746
701-848-2722
<http://lostwoodwetlands.fws.gov>

Sullys Hill National Game Preserve

PO Box 286
Fort Totten, ND 58335
701-766-4272
<http://sullyshill.fws.gov>

Tewaukon NWR & WMD

9754 143 1/2 Ave. SE
Cayuga, ND 58013
701-724-3598
<http://tewaukon.fws.gov>

Upper Souris NWR

17705 212th Ave. NW
Berthold, ND 58718
701-468-5467
<http://uppersouris.fws.gov>

Valley City WMD

11515 River Road
Valley City, ND 58072
701-845-3466
<http://arrowwood.fws.gov>