



Dear Teacher,

Thank you for choosing the McHenry County Conservation District's "Winter Ecology" field trip at Prairieview Education Center in Crystal Lake. The purpose of this program is to teach students about the seasonal changes during winter and its effects on the life cycles of plants and animals. Students also learn to identify trees in winter and about life under the snow and ice.

Please make sure all teachers and chaperones attending the field trip are aware of the following information.

1. The field trip is generally 3.5 hours long. Please note your start and end time on the permit. This field trip usually includes time for the students to have lunch on site. The first half of this field trip is indoors; the second half is mostly outdoors.
2. Teachers, chaperones, and students should dress in layers, and wear long pants and sturdy, warm footwear for hiking, possibly through snow.
3. To assist the field trip leaders in getting to know your class, please have the students wear secure nametags.
4. Encourage everyone to bring a waste-free lunch! Pack lunches in insulated, reusable containers and include items that can be eaten in their entirety, recycled or composted. Examples are whole fruits and vegetables; drinks in reusable bottles, snacks purchased in bulk and brought in reusable containers, cloth napkins, and reusable ice packs. For additional information on reducing waste visit www.epa.gov/eapwaste/wycd/index.htm.
5. A teacher packet for this program is available at the Conservation District's website. The packet includes a "What to Expect" information sheet, map to Prairieview Education Center, student booklet that is used during the field trip, post-trip evaluation sheet, and pre-trip and post-trip activities. Make a copy of the student booklet for each student attending the field trip. The pre-trip activities are designed to give students background information prior to the program. Take time to do the activity as the information is built upon during the program. There is also background information for *activities that the classroom teachers are expected to lead on the day of the field trip. Read through this information and have a teacher prepared to lead these activities on the day of the field trip.* The post-trip activities are designed to provide the students with an extension to the activities provided during the program.
-Download the packet from our website at www.mccd.org
-To request a packet be sent to your email or school address, call Andy Talley at 815-479-5779.
6. Contact us in the event of inclement weather on the day of your field trip. While there is not much room to reschedule, we try to accommodate your needs. We have indoor facilities that can be used as necessary.

We look forward to a day of fun and learning with your class. Please call 815- 479-5779 with any questions.

Sincerely,

Andy Talley, Education Program Coordinator

Winter Ecology Group Sessions

Led by classroom teachers

Animal Adaptations in Winter:

Introduce the different ways that animals survive the winter- special adaptations such as thicker fur and fat reserves, caching food, migration, and hibernation.

Hibernation is one of the most misunderstood of these adaptations and deserves some in-depth discussion. We have chosen the groundhog or woodchuck to describe in detail just what true hibernation is.

The groundhog is one of the few true hibernators in Illinois. In the early fall the groundhog will eat large amounts of food, gaining weight and accumulating fat, up to $\frac{1}{2}$ inch all over its body. They have separate winter burrows located in more protected areas such as within woods or hedgerows. As hibernation begins they will seal themselves inside these burrows and then go into a very deep sleep. Hibernation may last from September through late January to early March. During hibernation, body temperature drops from 96.8 degrees F. to between 38 and 57 degrees, the heart rate slows down from about 80 beats/minute to about 4 or 5 beats/minute, breathing slows down from 30-40 breaths/minute to about once every six minutes. They do not eat all winter; their bodies live off their stored fat reserves while they sleep underground. When the groundhog wakes up, it will be about half the weight it was when it went to sleep. Other true hibernators in McHenry County are ground squirrels, white-footed mice, and bats.

Many other animals, such as bears, skunks, and chipmunks, are not true hibernators. They may sleep for up to three weeks at a time, but their body temperature, heart rates and respiratory rates do not drop as drastically as a true hibernator. They will wake up and become active on warm days, or wake up and eat a little and then go back to sleep. Chipmunks will cache food in their burrows for this purpose.

Some animals such as squirrels, rabbits, deer, raccoons, foxes, coyotes and many birds do remain active in this area during the winter. During a winter hike, you can often find evidence of these animals' activities. Discuss tracks, browse, and scat.

Wildlife Food Web Game:

This is a teacher led game. See the enclosed instruction sheets. You will also want to discuss how winter affects the flow and availability of food through the ecosystem.

Animal Adaptation Questions

Coyote

1. A coyote's nose is very sensitive and has a highly developed sense of smell. How can this help a coyote survive?
2. The coyote is one of the most adaptable animals in the world. They can change their breeding habits, diet and social dynamics. How does this ability help them live by us?
3. The coyote can run almost 40mph and jump over 8 feet. How does this adaptation help the coyote?
4. Coyotes are light gray or tan with a black tipped tail. What advantage does this give them?
5. In the winter a coyote produces an undercoat of fluff. Why do you think this happens?

Beaver

1. Beavers have long incisor teeth. Why do you think they have these?
2. Beaver feet are webbed. Why do you think they are?
3. Beavers have special castor glands on their abdomen that produce oil that the beavers rub over their bodies. What use is this oil?
4. Beaver's ears have a special muscle that allows them to close these openings. Why have they developed these muscles?
5. Beaver hair is hollow. Why do you think it is?

Deer

1. Deer are fast moving and have slender bodies. Why would body shape matter?
2. In the summer deer have red-brown fur, which changes to gray-brown during the winter. Why would this be?
3. The throat and under belly of a deer are white. What advantage would this be to the deer?
4. Deer have hollow hair. What could the reason be for this?
5. Deer have mostly grinding teeth. Why is this so?

Mink

1. Mink have long slender bodies. What advantage is this to them?
2. Most mink are dark brown in color? How does this help them to survive in their environment?
3. They have an oily outer layer of fur that repels water. Why do you think they need this?
4. The mink's ears are short. Why would this be an advantage to them?
5. In the winter minks grow long guard hairs. How would this help them in the winter?

Rabbit

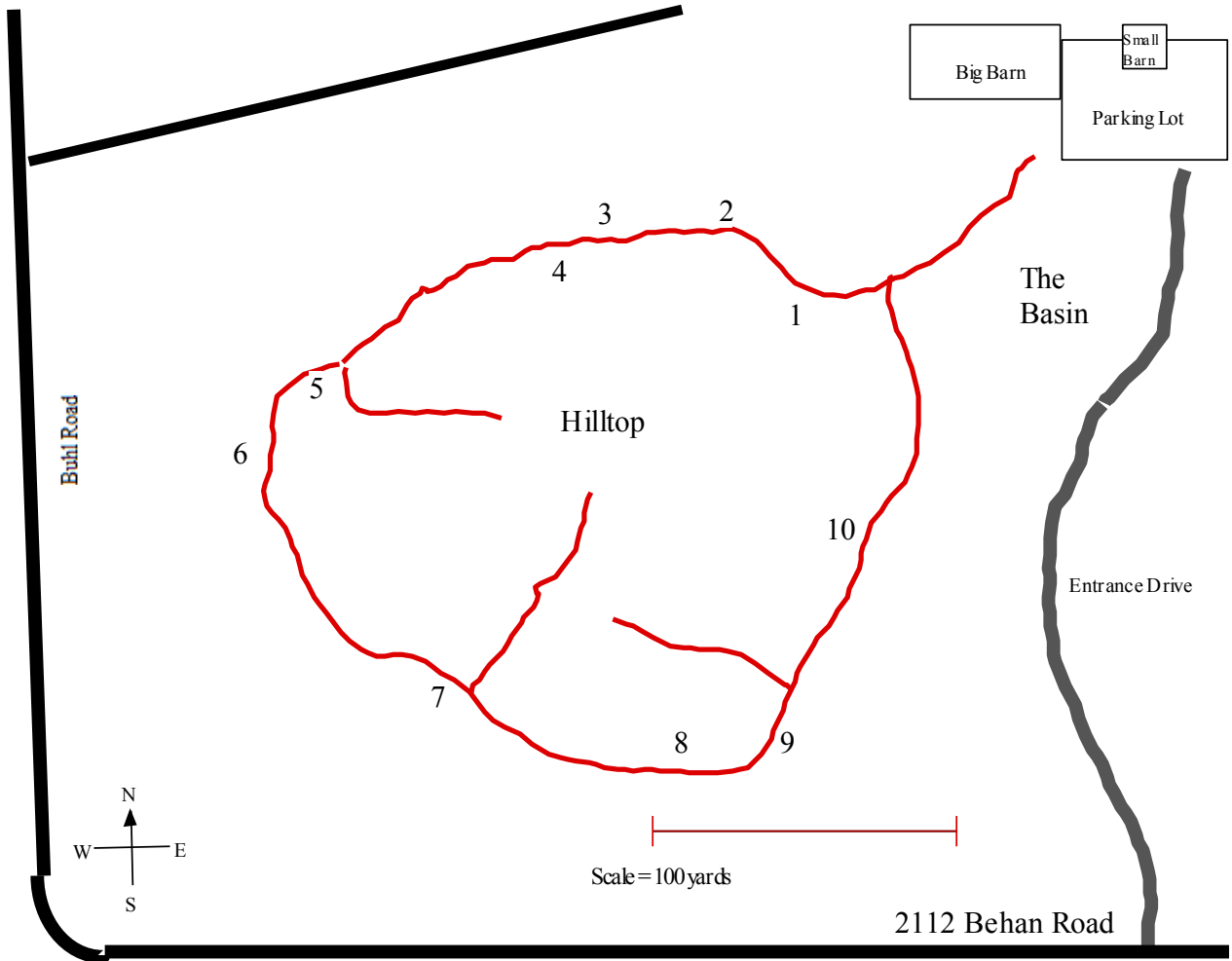
1. The snowshoe rabbit has white fur in the winter and dark fur in the summer. Why do you think this is so?
2. Snowshoe rabbits in the winter have hair that grows between their toes. For what reason do you think this is?
3. Rabbits run in zigzag patterns when chased by predators. Why would they do this?
4. Rabbits have their eyes on the sides of their heads. What advantage would this give them?
5. Rabbits have very large ears. For what advantage would they need these?

McHenry County Conservation
District
Prairieview Education Center
Field Trip



2112 Behan Road
Crystal Lake, IL
60014

Name _____
Period _____
Science Teacher _____



Example Winter Ecology Schedule
By Group

9:30 – 9:50 All Groups together, MCCD introduction in Vista Room

9:50 – 10:00 Break and split into groups

Group A – In Conference Room

10:00-10:25 – Animal Adaptations

10:30-10:55 – Life under the ice and snow

11:00-11:25 – Plants in winter

11:30-12:10 – Woodland hike

12:10-12:50 – Lunch in classroom & Tree ID

12:50- 1:15 – Food Chain Game

Group B – In A/V Room

10:00-10:25 – Plants in winter

10:30-10:55 – Animal adaptations

11:00-11:25 – Life under the ice and snow

11:30-11:55 – Food Chain Game

11:55-12:35 – Woodland hike

12:35-1:15 – Lunch in classroom & Tree ID

Group C – In Classroom

10:00-10:25 – Life under the ice and snow

10:30-10:55 – Plants in winter

11:00-11:25 – Animal adaptations

11:30-12:10 – Tree ID & Lunch in classroom

12:10-12:35 – Food Chain Game

12:35-1:15 – Woodland hike

Load Busses at 1:15 return to school by 1:30.



Opossum



Raccoon



T U R K E Y



River Otter



Muskrat



Red Fox

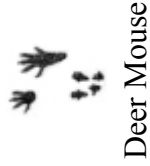
Winter Tracks in McHenry County

Life Under the Snow and Ice

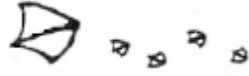
Write a short paragraph on what happened during the experiment:



Beaver



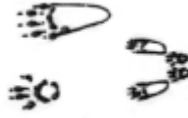
Deer Mouse



Canadian Goose



Eastern Cottontail
Rabbit



Gray Squirrel



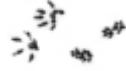
Coyote



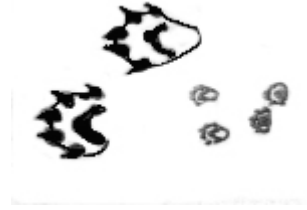
Gray Fox



Long-tailed
Weasel



Meadow Vole



Mink

Food Chain Game

Write a short paragraph on what happened to the different populations.

Plants in the Winter

Write a short paragraph on what happens to plants in the winter.

Winter Tree Identification

Coniferous Trees



Long Thin Needles in bundles
2 to 5 needles per bundle
Pines

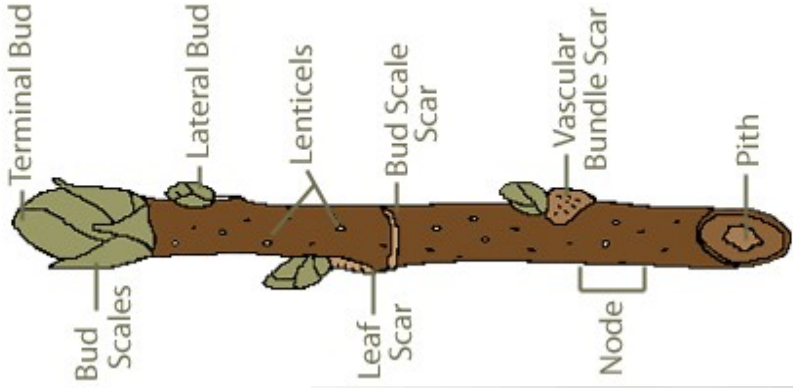


Short needles
Arranged singly
Spruces, Firs, Hemlock



Flattened Scale-like
needles
Cedars

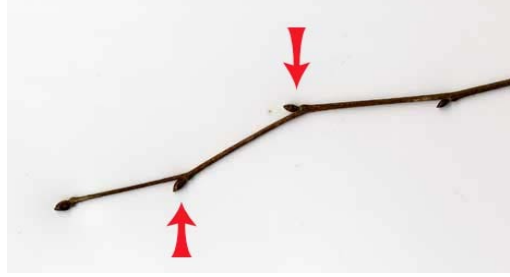
Deciduous Trees



Opposite Buds



Alternate Buds



6) Look at the ground between these Oak trees. You will notice animal trails between the trees that appear to go right through the trees. What type of animal made these tracks and why do they appear to go through the trees?

7) Look at the fallen log. Why do you think this is an important feature in woodland winter ecology? What signs do you see that might help to confirm your answers?

8) You have seen how smaller animals and insects might use trees for winter homes. Look at the lower portion of the large tree. What do you see and who might be living there? Are they true hibernators?

9) Different plants have different ways of spreading their seed. The plant in front of you is the burdock plant with plenty of seeds. What adaptation can you identify that would help this plant spread its seed? *Please leave the seeds on the plant!*

10) Winter is a very difficult time of the year for animals because of the severe cold and wind. What is it about the physical features of this part of the woods that might attract animals in search of protection from the elements?

11) This display shows several manmade boxes for different animals to rest or nest. Now look for the bird box off to the side of the display. What type of bird box is it?

Self Guided Hike

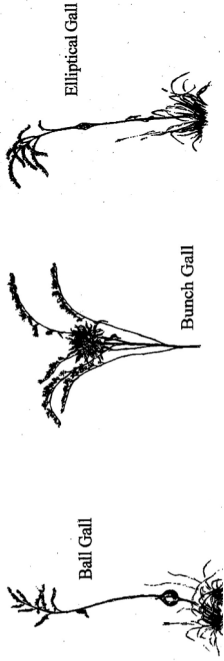
The numbered questions and comments correlate to the numbered stakes along the trail and the map. Throughout the hike you will see many animal tracks. Use the “Animal Tracks Guide” to help you identify them.

1. Look for small holes or raised areas in the snow next to the path. What animals made these tunnels? How does the snow help these animals?

2. Take a look at the large brush pile. What types of animals might shelter here? What types of animals might prey on the smaller animals?

3. Look at the small trees in front of you. One has the bark scraped off the tree and the other has been broken. This was done in the fall, by one of the largest animals native to this area. What animal did this?

4. Look to see if you can find the three different types of galls. The ball gall, the elliptical gall, and the bunch gall. Insects use these for food and shelter. Galls are tumor-like growths formed by the plant growing around a insect egg. The insects use the plant for food and protection. The ball gall is formed by the larva of a small spotted winged fly that will spend the winter in the gall. The bunch gall is formed by a midge. It makes the gall look like a flower. The elliptical gall is formed by the larva of a moth. What other animals might reuse the gall shelter?



5. Notice the hole high up on the trunk of the tree. What animal made this hole? What kinds of animals or birds do you think use the cavity now?

Prairieview Winter Tree Identification Key

- | | | |
|-----|--|------------------------------|
| 1- | Evergreen, needle-like leaves present Deciduous leaves | go to #2 go to #4 |
| 2- | Flattened scale-like needles along branch Needles over 1" long in bundles of 2 to 5 | Red Cedar go to # 3 |
| 3- | Needles 4" to 6" in bundles of 2 Needles 2" to 4" in bundles of 5 | Red Pine White Pine |
| 4- | Leaf buds opposite Leaf buds alternate | go to #5 go to #6 |
| 5- | Buds gray-hairy, scars thin & curved Buds red, blunt | Box Elder Red Maple |
| 6- | Leaf scars large, heart shaped Leaf scars small, inconspicuous | go to # 7 go to # 8 |
| 7- | Leaf buds gray/fuzzy No apparent leaf buds | Black Walnut Honey Locust |
| 8- | Tight cluster of red-brown terminal buds Terminal buds not as above | go to # 9 go to # 10 |
| 9- | Terminal buds narrow, sharp Terminal buds small, round, hairy | Black Oak Bur Oak |
| 10- | Buds less than 3/16", brown, pointed Buds greenish, brown with dark borders | Black Cherry Red Mulberry |

Tree

- A _____
- B _____
- C _____
- D _____
- E _____
- F _____

Note taking for Ecology Outdoor Lab
Animal Adaptations

Pick three questions to answer under each animal. Answer in the following areas. Be sure to add number of question.

Deer

Rabbit

Mink

Beaver

Coyote

THE FOOD WEB GAME

(modified from *Hooked on Science; Ready-to-use Discovery Activities for Grades 4-8* by Susan Breyer Seawall)

This game introduces students to the basic idea of how energy is transferred within an ecosystem, and the interdependence of animals within that ecosystem. Students will learn about the components of a complete food web and then be actively involved in collecting those components to create a food web.

Overview

Gather the students and explain that the object of the game is to create a food web while playing a game similar to "Go Fish" and "Old Maid." They will trade cards with other students until they have a complete food web. Students need to know the components that make up the food web in order to be successful at this activity. ASK the students what they think the components of a food web are. *Briefly*, talk about their answers being sure to close the discussion with the correct answers.

A complete food web consists of:

Sun, producers, primary consumers, secondary consumers, third order consumers, scavengers, and decomposers.

*Note-The cards are provided at the field trip and show examples of each component of a food web in a deciduous woodland ecosystem. If time is short, simply review for the students the components of a food chain along with an example of each.

*EXTENSION

Have your students prepare the cards as a pre-trip activity. You will need a total of 48 5 x 7 file cards labeled:

| | | | |
|--------------------------|---------------|----------------------|------------------------|
| Sun (6) | Producer (10) | Primary consumer (6) | Secondary consumer (6) |
| Third order consumer (6) | Scavenger (6) | Decomposer (6) | |
| People (1) | Pollution (1) | | |

If you do the extension; have your students research a food web for a deciduous woodland habitat to find which plants or animals belong to each component above. Then have them label the cards with words above, adding the name or a picture of what they found that goes with it.

Some examples might be:

Producer; oak tree, milkweed, grape vine

Primary consumer; chipmunk, field mouse, caterpillar

Secondary consumer; garter snake, woodpecker, praying mantis

Be sure they create all 48 cards in the quantities listed above.

General Procedure

-This game may be played for points, keeping a running total for each class rotation. Or, the game may be played without keeping track of points by simply having a winning group with each round.

-When you are ready to play, divide the class into 6 groups. Give each group one "hand" of cards. Point out that when each group gets their cards, they will have eight cards, yet only seven are needed to win. Explain that there are two special cards in the deck; people and pollution.

The people card is sometimes helpful to a food web. It can be used as a wildcard to replace any web component that they are missing. If you are keeping score and a group has the people card when another group completes their food web, 50 points will deducted from their score. If the group with the people card completes their food web first without having to use their people card, they get 200 points for winning.

THE FOOD WEB GAME

(modified from *Hooked on Science; Ready-to-use Discovery Activities for Grades 4-8* by Susan Breyer Seawall)

The pollution card is always bad. Whichever group has it when the game is over loses 50 points. The people and pollution cards can be traded just as any other card. *Whether you are keeping score or not; you can not win if you have the pollution card.*

-Groups will trade cards by sending 1 representative from the group to the center of the playing area and trade their unwanted cards with another group. Cards must be traded for even number of cards, ie; 2 for 2 cards, not 3 for 2 cards, etc. Cards should not be shown to other players during a trade. The group will not know what they got until the representative returns to the group and they look at the new cards together.

-When a group has a complete food web they should shout "FOOD WEB!" and all trading stops as this group proves to the others that they do have a complete food web. If not, the trading continues.

-The winning group gets 100 points if you are keeping score. The class should have enough time to play several rounds.

Playing the Game

Now that everyone understands the game, divide the class into 6 groups and ask each group to go to different corners of the area. Then deal out 6 hands and distribute them to the groups.

The group needs to work quickly and quietly to determine which cards they want to trade. When they are ready, 1 representative holds the cards to his/her chest and walks to the center of the area.

When in the center, he/she announces the number of cards they want to trade. "TWO...TWO...TWO," until a trading partner is found. No group should be forced to trade with another group. If group A just traded the pollution card to group B, then when they return to trade again with all the groups, Group A does not *have* to trade with B if they fear Group B is getting rid of the pollution card.

The round is over when a group has a complete and verified food web. Play several rounds if you have time. When the game is completed, tally the scores.

Be sure to allow 5 minutes at the end to collect the cards and to wrap up the activity.

Winter Ecology
WHAT DO ANIMALS DO IN WINTER?
DEFINITIONS

Read the paragraph below to learn what the **bolded** words mean. Then use the word list to fill them in the appropriate blanks below.

Winter is a hard time for many animals. In order for them to survive, many have **adaptations** that help them cope with hazardous weather and a shortage of food. Some animals, including many birds, some bats and one species of butterfly, the monarch butterfly, **migrate**, flying south for the cold season. Often they don't leave because of the cold, but because their food is too hard to find. Some animals spend the fall finding food and then storing or **caching** it so it will be available during the winter. Other animals are **dormant** during the coldest part of the winter, using as little energy as possible, but perhaps becoming active on warmer days. Still others, such as the groundhog, prefer to sleep the winter away, or **hibernate**. The groundhog's body temperature will drop and it's breathing rate slow during hibernation. Very few animals are true hibernators.

Adaptation
Migration
Dormant

Caching
Hibernation

1. When a plant or animal is inactive so that it can endure a period of environmental stress such as extreme heat, cold, or scarcity of food, it is _____.
2. A prolonged state of sleep, which enables an animal to escape winter and wait for warmer weather, is called _____.
3. The spring movement of birds or insects from their wintering grounds to their summer nesting grounds and the fall movement in the reverse direction is called _____.
4. The evolution of certain characteristics of an animal that makes the animal more fit for living under the condition of its environment is _____.
5. The act of hiding or storing food until it is needed again, or _____, is a common practice among some animals as they prepare for winter.

WINTERTIME IN MCHENRY COUNTY

Compare and contrast the ecosystems of McHenry County. Look for sources of food, water, and shelter. Look at the space available and think of the carrying capacity of each ecosystem—what animals could and do live here? Use the Northern Illinois Animals worksheet to help you.

| <u>PRAIRIE</u> | <u>WOODLAND</u> | <u>WETLAND</u> |
|----------------|-----------------|----------------|
|----------------|-----------------|----------------|

FOOD:

FOOD:

FOOD:

WATER:

WATER:

WATER:

SHELTER:

SHELTER:

SHELTER:

ANIMALS:

ANIMALS:

ANIMALS:

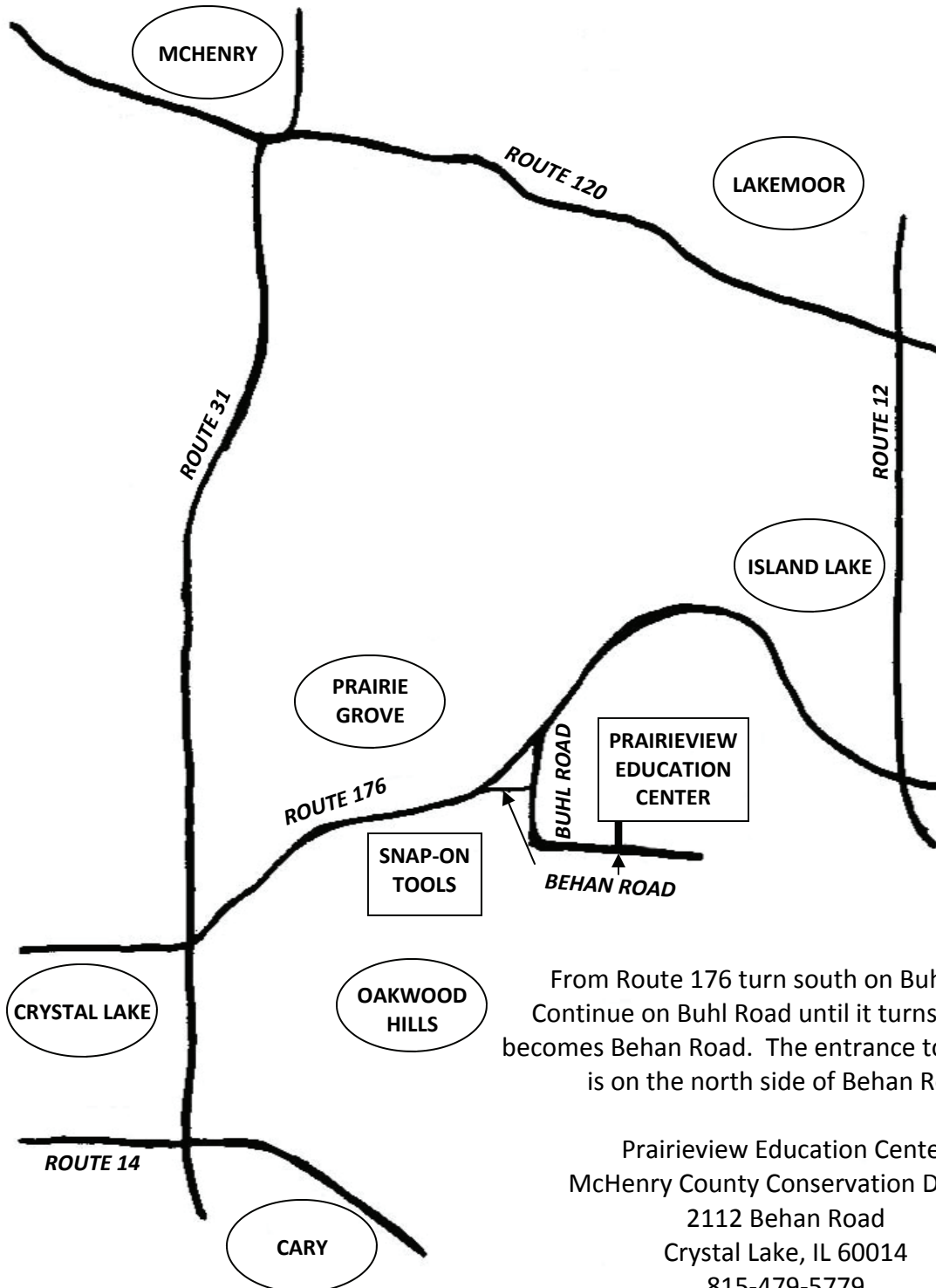
NORTHERN ILLINOIS ANIMALS IN WINTER

| Species | Overwintering Stage | Habit | Habitat | Food Sources |
|------------------|---------------------|------------|--------------------------------|-------------------------------------|
| Little brown bat | - | hibernates | cave or mine | - |
| Beaver | - | active | lodge under ice | bark & twigs |
| Chipmunk | - | dormant | below frost line in burrow | cached seeds and nuts |
| Coyote | - | active | fields and woods | animals |
| Deer | - | active | sheltered woods | twigs, buds |
| Mink | - | active | near water | muskrats, etc. |
| Jumping Mouse | - | hibernates | below frost line | - |
| Deer Mouse | - | active | woods & fields under snow | seeds, nuts, bark, insects |
| Muskrat | - | active | cattail lodge | roots, stems, clams, fish |
| Raccoon | - | dormant | hollow trees, under rocks | omnivorous, near streams |
| Carpenter ant | adult | inactive | in trees or logs | - |
| Monarch | adult | migrates | Mexico and CA. | nectar |
| Bumblebee | queen only | inactive | underground, under logs | - |
| Cricket | egg | inactive | in the ground | - |
| Ladybug | adult | inactive | under leaves & grasses | - |
| Snapping turtle | - | hibernates | under mud, in marsh or pond | - |
| Canada goose | - | migrates | S. US & Mexico | greens |
| Chickadee | - | active | N. US & Canada | insects, conifer, seeds, berries |
| Great horned owl | - | active | N. America | small mammals |



McHenry County
CONSERVATION DISTRICT

HOW TO GET TO PRAIRIEVIEW EDUCATION CENTER



From Route 176 turn south on Buhl Road. Continue on Buhl Road until it turns east and becomes Behan Road. The entrance to the center is on the north side of Behan Road.

Prairieview Education Center
McHenry County Conservation District
2112 Behan Road
Crystal Lake, IL 60014
815-479-5779



Field Trip Evaluation

Mail or fax your form to:

Education Services Manager, Prairieview Education Center, 2112 Behan Road, Crystal Lake IL 60014
Tel 815-479-5779 / Fax 815-479-5766

Thank you for participating in a McHenry County Conservation District field trip with your class. The Education Services Department wants to make sure the field trips are the best they can be, so that you meet your classroom goals. We sincerely appreciate your feedback on the field trip you attended.

School Name _____ Grade ____ Teacher's Name _____

Name of the Program _____ Date of Field Trip _____

Conservation District Leader Name(s) _____

1. Did you choose to receive your field trip packet by mail, email, or did you download it from our website?
2. How was the field trip packet helpful in preparing you and your class for the trip? What activities did you use? How could the packet be improved?
3. What were your goals for the field trip? Were they met? How could the program better serve your goals?
4. Were the trip activities and information educational and stimulating for the children? What activities do you recall that worked especially well? What activities could use revision?
5. Was your field trip leader well informed about the subject matter and enthusiastic about working with the group?
6. Would you participate in another Conservation District field trip?
7. Do you have any additional suggestions, comments, or remarks?

If you would like to receive our Environmental Education Opportunities Teachers' Guide electronically (Adobe pdf format) please provide an email address here. _____