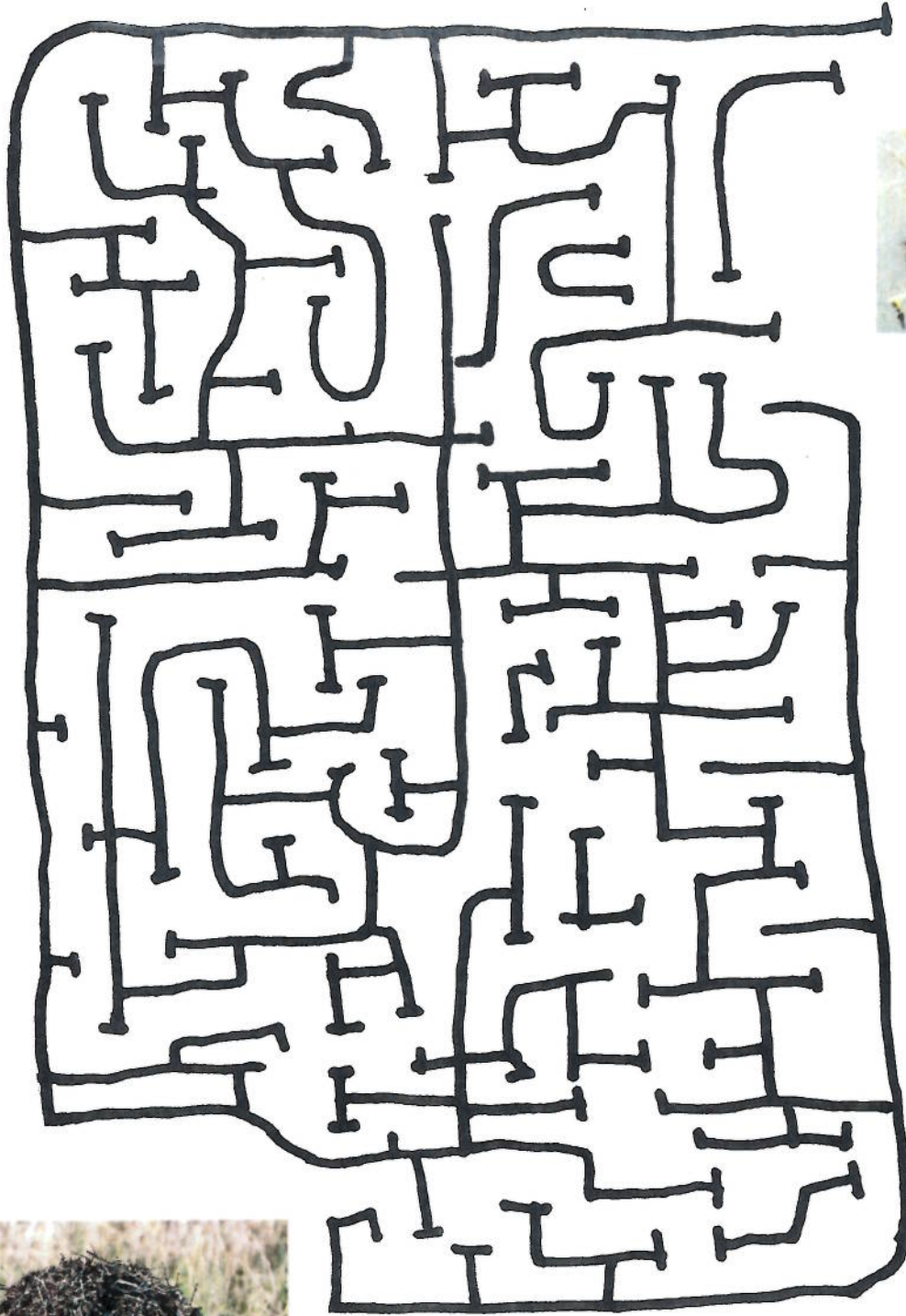


Muskrat Maze

Help the muskrat find its lodge.



Tracks Bingo

Subjects: Science

Objectives: Students play bingo to become familiar with animal tracks.

Materials:

- Copies of Tracks page (one for each student to cut up and two for you)
- Blank TRACK card for each student
- Markers (beans, poker chips or small pieces of paper)
- Glue Sticks

Procedure:

1. Before class, cut up two of the track sheets and place in a hat or can.
2. To begin, review the tracks with your students. Tell them they will be playing a game of Bingo, using animal tracks instead of numbers. Each student will need a sheet with tracks on it, a glue stick and a blank TRACKS card. Once the students have these, have them cut out the tracks and glue them in any order to the blank TRACK sheet (one track in each square). There will be two tracks left over. The middle space is FREE.
3. Play TRACK. Start with the letter T and choose a track card from the can or hat. Example: "T- Grizzly Bear." Keep a tally sheet of the cards you draw for each letter. Then go to R. Choose another track. Continue reading all the letters across (TRACK) and begin again once you get to the end. Students should mark the tracks they have on their cards as you call them out.
4. When someone gets a TRACK (5 in a row), they should call out, "TRACKER!" Check his or her answers with your tally sheet. You can then have students clear their cards to play again, or they can go for a black out.





Big horn sheep



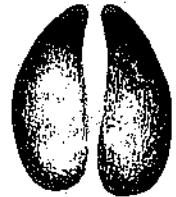
Bobcat



Raccoon



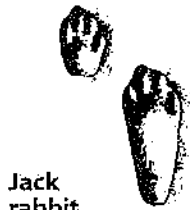
Red squirrel



Elk



Gray wolf



Jack rabbit



Moose



Grizzly bear



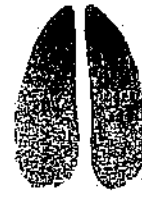
Deer mouse



Badger



Chipmunk



White-tailed deer



Wolverine



Mink



Pika



River otter



Porcupine



American marten



Muskrat



Mountain lion



Striped skunk



Mountain goat



Kangaroo rat

BINGO


T

R

A

C

K

Move Over Rover

Objectives

Students will: 1) list factors that influence the distribution of animals in ecosystems; and 2) generalize that each ecosystem has characteristic animals adapted to live there.

Method

Students play a game in which the object is to identify characteristic animals found in several ecosystems and match these animals to the environment in which they live.

Materials

Animal Cards (46); materials for creating eight ecosystem posters; Educator Answer Key (Educators may want to laminate Animal Cards for long-term use.)

Background

Ecosystem diversity is affected by many influences, such as climate and the level of human disturbance. Animal diversity is generally higher where there is a mild climate and an

abundance of food and cover, or where ecosystems overlap. New ecosystems and ecosystems that are harsh tend to have relatively few species because not many species are adapted to the extreme conditions.

The most fundamental of life's necessities for any animal are food, water, shelter and space in a suitable arrangement. Without these essential components, animals cannot survive. Most animals' requirements for food, shelter and nesting and breeding sites often are tailored to their ecosystems; however, different kinds of animals respond differently to environmental variables. Consequently, few animals fit neatly into a single ecosystem. Some animals reside in certain ecosystems year-round, while others migrate to different altitudes or latitudes seasonally. Still other species move among ecosystems on a time scale of days to weeks, using one area for feeding and another for reproduction.

Procedure

1. Copy the Animal Cards and cut apart.
2. Divide the class into eight teams and have each team research the biotic and abiotic characteristics (temperature, precipitation and vegetation) of the following North American ecosystems: forest (mostly conifers), woodland (mostly hardwoods), shrub land, grassland, aquatic/riparian, desert/semi-desert, tundra and subalpine. (Unlike tundra, subalpine ecosystems have trees such as fir, spruce and aspen.) Ask each team to write a paragraph and to make a poster depicting the ecosystem.
3. When the posters are complete, ask a member from each team to read the description of their ecosystem. Ask all students to listen carefully to the information presented.

Grade Level: 5-6

Subject Areas: Science, Expressive Arts, Environmental Education

Duration: one 45-minute period

Group Size: eight teams of three to four students

Setting: outdoors or indoors

Conceptual Framework Topic References: BDIA1, BDIB1, BDIB3

Key Terms: ecosystem, diversity, habitat

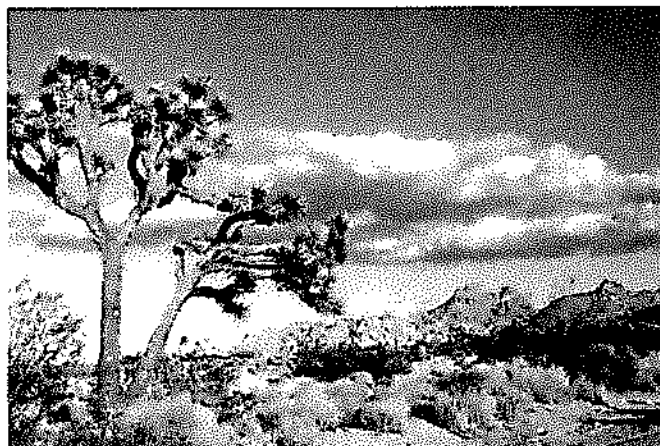
Appendices: Ecosystem Concept

4. Divide the playing space into eight equal portions and place one ecosystem poster in a visible place in each portion.
5. Divide the class into eight equal groups so that the original teams are evenly distributed among these new groups. Ask each group to stand under one of the ecosystem posters.
6. Explain to the groups that they will be playing a game in which the object is to match animals to the environment in which they live. Explain that each student will receive a card giving information about an animal that lives in a particular ecosystem. The class will need to decide if the animal is already in the ecosystem in which it could live or if it must "Move Over Rover" to another ecosystem.
7. Distribute the Animal Cards to the students.
8. One by one, ask students to read their cards and guess the animal depicted. If they believe they are in the wrong ecosystem, they can voluntarily move over to the proper one. If classmates think a student has made an incorrect choice, they say "Move Over Rover" and then explain why the animal should move and to which ecosystem it should move.
9. When all of the animals have been placed in an ecosystem, discuss the following questions:
 - Has each animal been placed in its proper ecosystem? If not, why?
 - Were there any animals that could be placed in more than one ecosystem?
 - How can some animals live in more than one ecosystem and why can't others?
 - What are the similarities and differences between animals that live in a certain ecosystem?
 - Which ecosystems had the greatest diversity of animals? What characteristics of these ecosystems were supportive of a higher diversity?
 - What factors influence the distribution of animals among ecosystems?
10. Ask the students to work with their original team members and research other animals that live in their ecosystems. What similarities in habitat requirements exist among the animals found there? How are their adaptations related to climatic conditions?

Evaluation

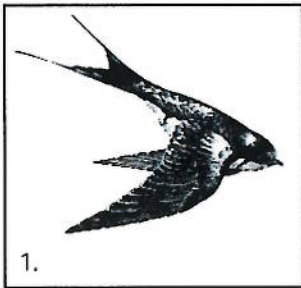
Pick any three animals from the leftover cards. Ask students to describe the ecosystem in which each animal lives, including identification of the animal's habitat requirements.

This activity was adapted with permission from "Wonders in Nature—Wonders in Neighborhoods" (W.I.N.—W.I.N.) Unit 5 Curriculum Guide, Colorado Division of Wildlife and Denver Zoological Foundation.

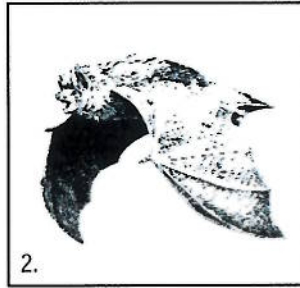


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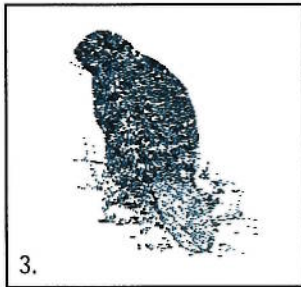
Animal Cards



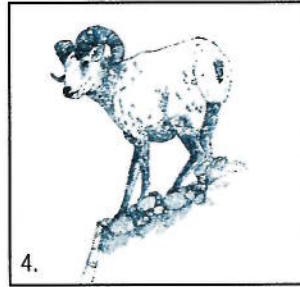
1. This bird likes to fly close to the ground and lives in open or semi-open areas. It builds nests of mud and grass.



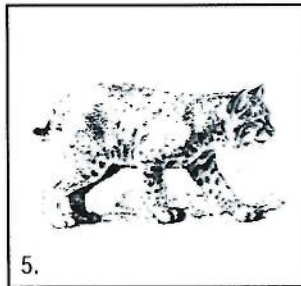
2. This mammal lives in deserts, forests and grasslands near rocky outcrops. It feeds on crickets, grasshoppers, scorpions and spiders.



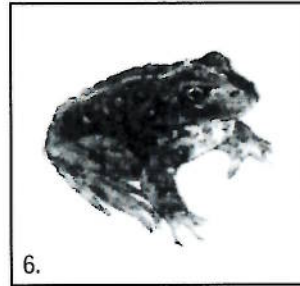
3. This mammal feeds on the inner layer of tree bark with the help of its large front teeth. It blocks streams and rivers with its dam.



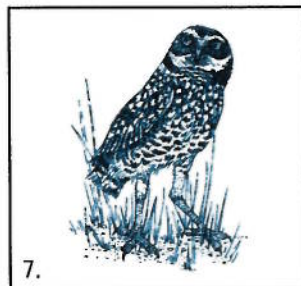
4. This mammal must be sure-footed to reach the sparse grass upon which it feeds.



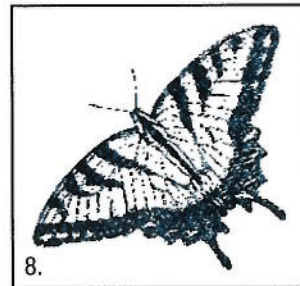
5. This mammal hunts at night and makes its den in rock crevices and hollow logs.



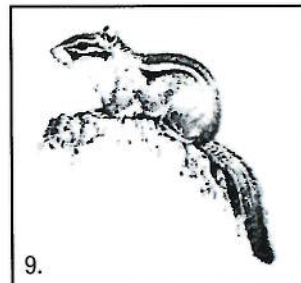
6. This amphibian is an incredibly small wood toad.



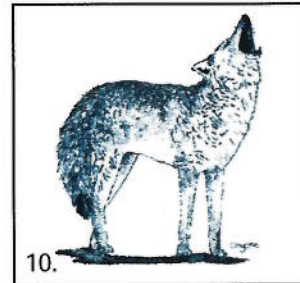
7. This large bird hunts at night. It lives in underground burrows of animals.



8. This insect's larvae feed on crops of alfalfa.

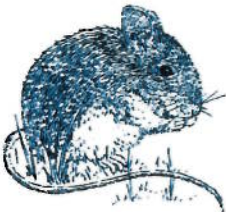



9. This animal feeds on seeds and acorns near streams and is common around camp sites.





10. This mammal eats small rodents, rabbits and birds. It also eats the remains of animals killed by wolves and mountain lions.


Animal Cards

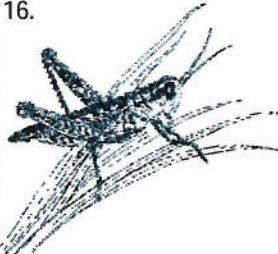
 <p>11.</p>	<p>This mammal nests in the ground, in trees and in stumps. It eats seeds, nuts and acorns, and it stores its food.</p>
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 <p>12.</p>	<p>This tick feeds on the blood of mammals.</p>
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 <p>13.</p>	<p>This insect lays its eggs in water. The mature insect can be seen flying using its large wings.</p>
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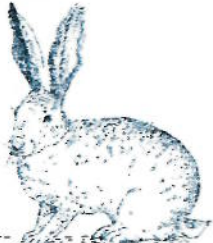
 <p>14.</p>	<p>This mammal's haunting mating calls echo through the high-country in late fall.</p>
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 <p>15.</p>	<p>This bird hunts large rodents, such as rabbits, during the day. It uses its keen eyesight to locate prey as it soars in the sky.</p>
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 <p>16.</p>	<p>This insect eats large amounts of vegetation. It lives in places that produce lots of green plants.</p>
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 <p>17.</p>	<p>This bird uses its long legs to walk through still water and hunt fish and water snakes.</p>
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 <p>18.</p>	<p>This bird hunts at night for rodents and snakes. It gets its name from the two tufts of feathers on the top of its head.</p>
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 <p>19.</p>	<p>This mammal uses its strong hind legs to escape predators.</p>
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 <p>20.</p>	<p>This mammal gets the water it needs from the plants it eats.</p>
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continued


Animal Cards


 <p>21.</p>	<p>This mammal can live in many kinds of places near water. It often nests in the burrows of other animals or under wood or rock piles.</p>	 <p>22.</p>	<p>This mammal is a good swimmer. It often feeds on grasses, seeds and bark.</p>
 <p>23.</p>	<p>This mammal is an excellent swimmer. It eats eggs, frogs, crayfish, birds and fish.</p>	 <p>24.</p>	<p>This large mammal eats twigs and bark in winter and water plants in summer in areas where beavers are common.</p>
 <p>25.</p>	<p>This insect feeds on the blood of many animals. It lays its eggs in still water.</p>	 <p>26.</p>	<p>This mammal eats brush and sparse grasses. Its name comes from its large ears.</p>
 <p>27.</p>	<p>This mammal eats mostly aquatic plants but it may also eat frogs, clams and other aquatic animals.</p>	 <p>28.</p>	<p>Once nearly extinct, this fast predatory bird has made a remarkable recovery since the ban of the pesticide DDT.</p>
 <p>29.</p>	<p>This mammal eats the bark of pine trees. It protects itself with its sharp, pointy quills.</p>	 <p>30.</p>	<p>This mammal's burrow provides homes for other animals, including burrowing owls.</p>


Animal Cards


31. 	This mammal runs incredibly fast in the wide-open spaces it lives in.
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32. 	This mammal eats many foods and may dunk the food in water before eating it. It often lives in hollow logs.
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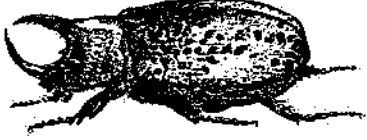
33. 	This brightly colored fish has been stocked in many areas and has moved into the territories of many native species.
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34. 	This reptile warns intruders to stay away with its rattling sound.
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35. 	This mammal uses its hunting skills to catch deer mice and other small mammals.
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36. 	This bird roosts in flocks near open water or in open areas.
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37. 	This fish-eating mammal lives along streams, lakes, marshes and rivers.
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38. 	This insect does not develop large wings because of high winds.
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39. 	This mammal comes out at night, and it sleeps in ground burrows or wood or rock piles.
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40. 	This mammal changes color with the seasons, which allows it to escape predators.
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continued


Animal Cards


 <p>41.</p>	<p>This popular catch for anglers is very colorful.</p>
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 <p>42.</p>	<p>This spider looks dangerous, but it hunts only insects and prefers a dry, cold climate compared to the climate in which humans live.</p>
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 <p>43.</p>	<p>This amphibian lives in or near water its entire life. It lives in mud at the bottom of the water during winter.</p>
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 <p>44.</p>	<p>This bird survives the extremely cold winters roosting in snow drifts and eating energy-rich willow buds. Its plumage is snow-white in the winter and mottled brown in the summer.</p>
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 <p>45.</p>	<p>This bird eats insects that live under the bark of trees.</p>
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 <p>46.</p>	<p>Larvae of this insect feed on yucca flowers.</p>
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Educator Answer Key

(Answers may vary for local species.)

Animal	Habitat	Animal	Habitat
1. Barn Swallow	Grasslands/Riparian	26. Mule deer	Woodland/ Shrub land/Forest
2. Bat	All terrestrial ecosystems	27. Muskrat	Aquatic/Riparian
3. Beaver	Aquatic/Riparian (in forest)	28. Peregrine falcon	Shrub land/Woodland/ Forest (near cliffs)
4. Bighorn sheep	Tundra	29. Porcupine	Forest
5. Bobcat	Forest/Riparian/Shrub land	30. Prairie dog	Grassland
6. Boreal toad	Subalpine (in forest)	31. Pronghorn antelope	Grassland
7. Burrowing owl	Grassland	32. Raccoon	Riparian/Woodlands
8. Butterfly	Grassland/Forest	33. Rainbow trout	Aquatic (in subalpine)
9. Chipmunk	Forest/Riparian/Woodland	34. Rattlesnake	Grassland/Semi-desert/ Shrub land/Forest
10. Coyote	Woodland/Shrub land/ Grassland	35. Red fox	Subalpine (in forest)
11. Deer mouse	Forest/Grassland/Woodland	36. Red-winged blackbird	Riparian/Grasslands
12. Deer tick	Shrub land/Forest	37. River otter	Aquatic/Riparian (in forest)
13. Dragonfly	Aquatic/Riparian (in forest, grassland)	38. Scarab beetle	Subalpine/Forest/ Grassland/Shrub land
14. Elk	Subalpine (in forest and grassland)	39. Skunk	Shrub land/Woodland/ Grassland
15. Golden eagle	Grassland/Shrub land	40. Snowshoe hare	Subalpine (in forest)
16. Grasshopper	Grassland	41. Sunfish	Aquatic
17. Great blue heron	Aquatic/Riparian	42. Tarantula spider	Shrub land/Semi-desert
18. Great horned owl	All terrestrial ecosystems	43. Tiger salamander	Aquatic/Riparian (in woodland/forest)
19. Jackrabbit	Grassland/Shrub land	44. Willow ptarmigan	Tundra
20. Kangaroo rat	Shrub land (semi-arid)	45. Woodpecker	Forest/Woodland/Riparian
21. Long-tailed weasel	All terrestrial ecosystems (near water)	46. Yucca moth	Grassland
22. Meadow Vole	Grassland/Riparian		
23. Mink	Aquatic/Riparian		
24. Moose	Riparian (in forest)		
25. Mosquito	Aquatic/Riparian (all but tundra)		