

TALLGRASS PRAIRIE

2014 Eco-Meet

Varsity



Illinois Prairie “The Prairie State”

Illinois is known as the Prairie State. For many people, the word “prairie” brings to mind visions of flat or slightly rolling farm land, dotted with houses and trees, and covered by neat rows of corn, wheat, and soybeans. The word “prairie” refers to a vegetation type that covered much of North America for thousands of years. Very little of that prairie remains today. The majority of the prairie in Illinois was referred to as tallgrass prairie.

History

The word “prairie” dates back to Latin (*pratum*), which meant “meadow”, presumably a treeless, grassy tract where livestock graze. The French explorers, in the late 1600’s, used the term, “prairie” when describing the terrain. Having encountered only forests in Eastern North America, the explorers were not prepared for the vast grasslands and plains that extended to the Rocky Mountains. The prairie was often referred to as a “sea of grass” because the tall grasses resembled waves on the ocean.

“This prairie land, far richer than anything known in Europe or in the previously explored portions of North America, obviously could support prosperous populations. ‘No better soil can be found, either for corn, for vines, or for any other fruit whatever,’ said Louis Jolliet after his discovery expedition in 1671. To him the region appeared ‘to be the most beautiful and most easily settled.’ Here a man could provide his own food and clothing, and ground could be plowed the day of arrival, without laboring ten years to cut down and burn trees. Father Marquette’s journal of their explorations said, ‘we have seen nothing like this river (the Illinois) that we enter, as regards its fertility of soil, its prairies and woods.’ The great promise of Illinois also impressed French explorer La Salle in 1680 and the generations that followed.”

Howard, Robert. Illinois A History of the Prairie State. Grand Rapids: Williams B. Eerdmans, 1972,1.

The prairies covered 61 per cent or 21.6 million acres of land in what is present day Illinois. All but nine of the present counties contained some portion of prairie. Illinois land, however, was not all grassland. Strips of forest bisected the grassland and formed multiple prairies. Dense stands of trees, mostly hardwoods, grew along the waterways, projected fingerlike into the open spaces, and at times encircled a sizable area.

Large numbers of trees growing along the rivers hid most of the view of the prairie from explorers traveling by water. The periodic overflow of the rivers created very fertile alluvial plains and rich breeding ground for swarms of malaria carrying mosquitoes. “The housefly did not exist in the wilderness, but hordes of stock flies swarmed from the woods and attacked the animals until they bled. Because of these insects, pioneer farmers often found it impossible to work in the heat of the day. Gnats and other insects pestered man and tormented animals. A traveler, in 1842, reported that ‘in the middle of these large prairies is a perfect solitude, without a living thing, except such as one would rather want than have, greenhead flies in thousands, snakes basking on the dusty track and myriads of grasshoppers, some of them as large as the little finger darting through the air like arrows and sometimes coming full tilt against the face.’” Ibid. 6.

A first wave of settlers out of Ohio and Kentucky moved into the far southern wooded portion of what would become Illinois shortly after the Louisiana Purchase (1803). By 1820 much of the southern part of the state was settled and pioneers were moving up onto the prairies. The initial settlement of prairie areas in Illinois took place between 1820 and 1840. Settlement during that time progressed from the south toward the north. At first settlers chose sites in the prairie groves because they offered building materials and shelter. As settlement progressed and the fertility of prairie soils became known farmers learned to farm the adjacent prairie.

Until the late 1830's, breaking prairie sod was a laborious and difficult job. Settlers used giant breaking plows that were up to 14 feet long. It took as many as seven teams of oxen to pull the plow to cut through the thick prairie sod. Besides the thickness and toughness of the sod, prairie soils stuck to the plowshares. Plowing was difficult as the farmers frequently had to stop to scrape off the soil from the blade. These difficulties slowed the plowing of the prairies until the development of the self-cleaning moldboard plow. The first such plows were made of polished steel. Building on the ideas of others, John Deere designed a self-cleaning steel plow and began selling it in 1837. As years progressed and the design of plows improved, the plowing of prairies accelerated. In addition, the coming of railroads increased markets and brought new settlers.

One hundred and eighty-six prairies were named and located in Illinois in an 1857 guide for settlers. By 1900, most of the prairies had been converted to agriculture or urban uses. By 1976, 39 of Illinois' 102 counties had no high-quality prairie remaining and of those counties with high-quality prairie, 28 contained five or less acres. Illinois prairies currently cover about 6,100 acres. Only 0.01 percent of the state's original prairie acreage, about 2,350 acres, is considered high quality. The remaining prairie lands have been disturbed in some manner. All prairie parcels in Illinois tend to be small. Eighty-three percent of the existing Illinois prairies are smaller than ten acres in size, and of these prairies, 30 percent are less than one acre.

Fire

Throughout history, fires helped maintain the ecosystem of the tallgrass prairie. Lightning-sparked fires occurred naturally, and Native Americans burned areas of prairie to make hunting easier. The herds of buffalo would return to eat the tender young shoots of prairie grasses that grew after a fire. As pioneers settled the area, farming tamed the prairie and Native Americans were forcibly relocated. As a result, fire frequencies diminished greatly.

Fire in a prairie is very beneficial. It kills tree saplings that may begin a forest takeover. It clears dead plant matter, blackens the ground enabling it to absorb heat and breaks open seed coats, all of which foster prairie seedling germination. Finally, fire destroys plant species that are not fire resistant and invasive species that threaten the native or desirable plants.

A common question, then, is how can prairie plants survive the fires? A prairie plant's life-giving bud is located beneath the ground. It is insulated from the fire and can resprout shortly after the fire.

Fire in woodlands is helpful as well, for many of the same reasons. The key to understanding beneficial fires is control. Any out-of-control or unintended fire may have some beneficial consequences, but these fires are dangerous and are certainly not to be condoned. A fire is not

considered beneficial, either, if it burns so that that all organic matter in the soil is consumed. This organic material is beneficial to the soil and vegetation. The purpose of a burn is not to combust all plant matter.

What about the greenhouse gases that are given off during a prairie burn? While it is true that greenhouse gases are given off, the thick and lush prairie regrowth that occurs recaptures many of the gasses given off. Therefore, a burn contributes little, if any, overall poundage of greenhouse gases to the environment.

Over 850 plant species are indigenous to the prairies of Illinois. Prairies are made of a mixture of grasses and forbs. Grasses have narrow leaves. Grasses are the dominant plant type in the prairie. Some of the indigenous plant species are grasses that grow up to 10-15 feet tall, thus giving the Illinois prairie the name “tallgrass prairie.” The roots of these plants can grow 15-20 feet deep. Forbs are plants with broad leaves like wildflowers. To compete with grasses, some forbs send their roots further into the soil than the grasses so that they may reach water and nutrients that the grasses cannot. Forbs such as spiderwort, rosinweed and goldenrod make up a large part of the tallgrass prairie. Animals such as butterflies, bees, dragonflies, rabbits and deer also call the prairie their home. This unique ecosystem is a hotbed of biodiversity. To maintain the beauty inherent in each species, we must preserve the habitat as a whole.

Human and Cultural Diversity

With the diversity of the prairie ecosystems comes a diversity of residents. The Native Americans were among the first known inhabitants of the prairie. Their ecosystem served as a source of food and materials and, in short, a way of life for their cultures. When white settlers moved to the prairie, the situation changed dramatically. The settlers brought a new way of life, a new system of agriculture and new values. Their arrival began a new, highly destructive chapter in prairie history.

Invasive Species

A serious problem facing tallgrass prairies and other natural areas is that of invasive species. Invasive species out- compete other species and therefore cause the biodiversity of an ecosystem to decline. Introduced invasive species are species that have been introduced either intentionally or unintentionally into new areas where they out compete native species. Examples of introduced invasive species that have caused environmental chaos are garlic mustard and purple loosestrife. Some native species become invasive when a major change that favors them takes place in their ecosystem. Examples of this category of invasive species in Illinois are cowbirds, which are favored by the increase in edge habitat created by agriculture and urbanization, and sugar maples, which are favored by the suppression of wildfires in woodlands.

Prairie Interdependence

A healthy prairie ecosystem is a wonderful example of interdependence functioning at its best. The plants have adapted to the harsh climate. The animals have adapted to the plants. As a whole, the prairie functions as a single living entity – ecosystem - composed of many parts. When a part is removed, many other parts run into problems. One good example of this is the fritillary butterfly. This butterfly is highly dependent upon the birdsfoot violet as a food for the

caterpillar. Habitat destruction has nearly wiped out the birdsfoot violet. As a result the regal fritillary is now an endangered species.



With only .01% of native Illinois prairie remaining, the original genetic variety of the lush grassland is greatly decreased. With fewer species, or a decrease in biodiversity, the chain reaction scenario detailed earlier comes into play, and the ecosystem is at risk. Biodiversity and interdependence go hand in hand, and the health of the ecosystem relies on them both.

Land Use

The prairies of Illinois built some of the richest soils in the world. The soils created by decaying plant matter supported hundreds of species of plants and animals per acre. Today these soils are feeding the world through agricultural practices that benefit from the historical ability of prairies to build soil. Unfortunately our current agricultural practices put these same precious soils under great strain. Most agricultural systems are monocultures that put tremendous strains on the soil and are highly affected by weeds and pests. Added chemical insecticides, herbicides and fertilizers have for the most part taken the “living tissue” of the soil and converted it to a sterile growth medium. Our prairie soils are no longer valued for their fertility; rather they are prized for their ability to release nitrogen that is applied via tractor.

Sustainability

Sustainability is the ultimate key to the survival of an ecosystem and the global system as a whole. As a species, we must do what we can to strengthen the ecosystems upon which we so heavily rely and to promote the sustainability upon which everything depends.

The prairie of Illinois is a good example of a self-sustaining ecosystem. Prairie plants are uniquely adapted to Illinois’ specific climatic conditions. The roots grow as deep as 15 feet into the ground, creating efficient paths for water to flow into the groundwater where it will not evaporate. The plants are flexible enough to bend with the wind yet strong enough to grow up to 10 feet tall. The plants have unique ways of protecting themselves from desiccation, and the roots thrive during fires. This allows the prairie to return for a new season. Microorganisms, fungi, insects, birds and mammals that frequent prairies are also adapted to survive the climate of Illinois and use the plants for food, shelter and water. This ecosystem is not only sustainable; it actually builds soil each year.

Restoration Improves Stability

Several reasons exist for restoration toward sustainability. One reason is for aesthetics. A healthy ecosystem is a thing of beauty. A second reason is for human benefit. Much of our food, fiber and medicine comes from or is patterned upon natural materials. To eliminate species is to take away opportunities for future discoveries. In fact our very existence as a species relies upon sustainability. An unsustainable world will not provide the means of existence for those that follow us. Human survival is threatened by a breakdown in ecosystems. A third reason is the human connection. By physically working in ecosystems to improve their sustainable qualities, humans develop a connection to the systems that goes beyond the actual work. Stewardship, or the management and monitoring of resources, is a means of developing a closer relationship to the land from which we come. Finally, and perhaps most important, improving sustainability factors directly benefits the ecosystems and species. Balance between human needs and ecosystem sustainability is essential.

Prairie Grasses

Prairies are classified as wet, mesic or dry. Wet prairies have much water present in the soil. Mesic prairies have a medium amount of water during the year. Dry prairies have very little water during the year.

Big Blue Stem: This grass grows to a height of 8' or more. It begins growing in late April and flowers in late summer. The seed head of its flower branches into three parts, looking something like a "turkeys foot." Big bluestem grows in the mesic prairie. This grass is also the Illinois State Prairie grass.



Side-Oats Grama: This 1 – 3 feet tall grass flowers during the summer. Its small (1/4”) “oat like” seeds line up on one side of its stem. Side-oats grama grows in the dry prairie.



Indian Grass: This 4 – 8 feet tall grass begins growing about the first of May and flowers during late July and August. It can be identified by the presence of a claw like structure where the leaf blade attaches to the stem. Indian grass grows in dry and mesic prairies.



Switch Grass: This 3-6 feet tall grass is identified by a prominent nest of hair where the leaf blade attaches to the stem. Switch grass grows in the mesic prairie.



Little Bluestem: This grass grows to be 2 – 4 feet tall; it grows from May until the first frost in fall. During spring and summer, the bottom shoots of little bluestem are bluish but by fall, they are a beautiful mixture of rust and gold. Its flowers are “feathery” covered with short, white hairs which bloom mid Aug.-mid Sept. Little Bluestem grows well in moist soil in bottomland.



Prairie Forbs

New England Aster: 1- 4 feet tall. This forb blooms August – October in mesic prairie. Its large, violet to red-purple flowers have yellow centers. Leaves are heart shaped at the base, clasp the stem and are rough to the touch.



Butterfly Weed: 1-2 feet tall. Warm season flower blooms late June to August in dry to mesic prairie. It is part of the milkweed family. Flowers are orange colored in a broad umbel. It has alternate leaves and does not exude white latex like most milkweeds.



Pale Purple Coneflower: 2 – 3 feet tall. Blooms late June to early July in dry and mesic prairies. It is one of the most beautiful of the prairie forbs. The blossom is pinkish. After blooming the petals fall off and the seed head turns dark.



Rattlesnake Master: 3 – 4 feet tall. Blooms in early July to August in mesic prairie. Flowers are thistle like, white spherical heads. Leaves are stiff, bayonet-shaped with teeth along the edges and look similar to a yucca leaf.



Black-eyed Susans: 1 – 3 feet tall, blooms July – August and is generally a biennial plant. Flowers have 10 – 20 showy yellow rays and a brown domed disk center. Lower leaves are oblong, toothed and hairy or rough. Upper leaves are oblong, lanceolate and alternate.



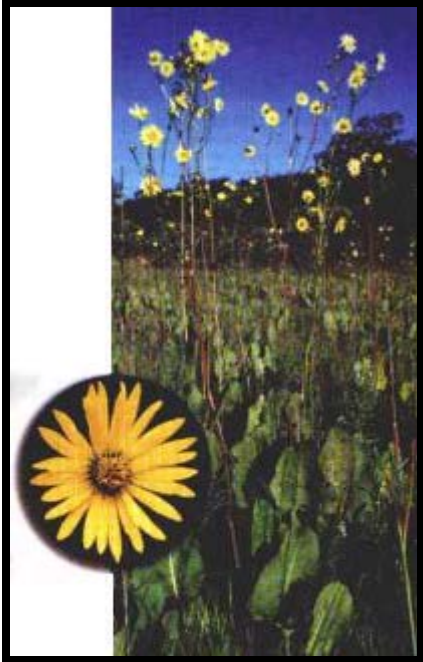
Stiff or Rigid Goldenrod: 2 – 4 feet tall and blooms in late August – October. Flowers look like miniature yellow asters arranged flat across the top. Leaves are stiff and rough, alternate on the stem.



Compass Plant: 4 – 8 feet tall and blooms late June – August. Yellow flower heads are at the tips of the branches. Heads have yellow rays and disk. The leaves are large, deeply cleft, and rough. Usually the leaves grow in the north and south directions. It has a woody taproot. It was an important plant to the diet of bison.



Prairie Dock: 5 – 7 feet tall and blooms July – September. Flowering stems are smooth with yellow heads. Each head has a center disk with 12 – 20 rays. Leaves are rough like sandpaper at the base of the plant and are arrow shaped. Prairie Dock forms a gum or rosin substance, which the early settlers chewed, as gum.



Prairie Insects

American Bumblebee
Bombus pennsylvanicus



Description 7/8" (2 cm). Large, furry bee, banded with black and yellow; thorax and segments 1-3 of abdomen yellow; black behind wings. Wings smoky. Queens larger than workers.

Field Cricket
Gryllus pennsylvanicus

Food: Plant materials outdoors, including seeds and seedlings of wild and crop plants, small fruits, and when available, dying and dead insects.

Sound: Common song is a series of triple chirps. Courtship song is a continuous trill at a pitch near the upper limits of audibility for the human ear.



Life Cycle: Female inserts eggs singly deep into the soil. Eggs overwinter in the North, where all unmaturing nymphs and adults die of the frost. In the South nymphs and adults may overwinter and produce 3 generations a year.



Praying Mantis
Mantis religiosa
European Mantid

Food: Diurnal insects, including caterpillars, flies, butterflies, bees, and some moths.

Life Cycle: Eggs overwinter in flat mass attached to exposed twigs above snow. They hatch almost simultaneously in late spring. Nymphs are dispersed by wind or eat one another. Survivors are solitary. One generation matures in late summer or early autumn.

Monarch
Danaus plexippus

Discussion One of the best known butterflies, the Monarch is the only butterfly that annually migrates both north and south as birds do, on a regular basis. But no single individual makes the entire round-trip journey. In the fall, Monarchs in the North begin to congregate and to move southward. Midwestern and eastern Monarchs continue south all the way to the Sierra Madre of middle Mexico, where they spend the winter among fir forests at high altitudes. Far western and Sierra Nevada Monarchs fly to the central and southern coast of California, where they cluster in groves of pine, cypress, and eucalyptus in Pacific Grove and elsewhere. Winter butterflies are sluggish and do not reproduce; they venture out to take nectar on warm days. In spring they head north, breed along the way, and their offspring return to the starting point. In recent years, the population of Monarch butterflies has dropped dramatically. Both Mexican and international efforts are underway to protect the millions of Monarchs that overwinter in Mexico. In California, nearly all of the roosting sites are threatened by development. In Illinois, the use of herbicides in and around agricultural fields has significantly reduced the populations of various species of milkweed used by the monarch caterpillar for food. Education and restoration efforts are underway to help landowners understand the importance of these plants in the Monarch's life cycle.



Eastern Tiger Swallowtail
Papilio glaucus



Life Cycle: Yellow-green, globular egg, 1/32" h x 3/64" w (0.8 x 1.2 mm), very large for a butterfly. Young caterpillar brown and white, resembling bird droppings; mature caterpillar, to 2" (51 mm), is green, swollen in front, with big, false, orange and black eyespots and band between 3rd and 4th segments. Mottled green or brown sticklike chrysalis, to 1 1/4" (32 mm), overwinters.

Discussion: This species is the most widely distributed tiger swallowtail, and one of the most common and conspicuous butterflies of the East. Alaskan, Canadian, and northeastern butterflies are smaller and paler than those of the eastern states. Feeding in groups, adults take nectar from a wide range of flowers.

Prairie Mammals

Before Europeans settled in Illinois, animals such as bison and elk roamed the prairie, but shortly after 1800, these mammals disappeared from the state because they were over-hunted and their habitat was turned into farmland.

The mammals that live in or around Illinois prairies today are those that have successfully adapted to changes in their habitat. Some of them live in the remnants of what used to be large prairies. Others have adapted to open farmland settings.

The smallest prairie mammals such as the thirteen lined ground squirrel and the prairie vole are active mostly at night and spend most of the day in under-ground burrows, safely away from birds and other predators. Rabbits, badgers, coyote and white-tailed deer also live on prairies.

Bison and elk, the largest prairie mammals, are no longer naturally found in Illinois. The wolves, cougars and even grizzly bears that once preyed upon these large grazers have retreated to remote areas of western and northern North America.

Following are some examples of prairie mammals to read and learn about.

Thirteen Lined Ground Squirrel

Discussion: Because ground squirrels spend most of their lives below ground, they build extensive burrows. Thirteen-lined ground squirrels make three types of burrows:

- *Hiding burrows* are short and there are lots of them.
- *Nesting burrows* are larger.
- *Hibernating burrows* are below the frost line (20-40 inches deep) and contain a large nest and a plugged entrance.



The thirteen-lined ground squirrel is from 4 1/2 to 6 1/2 inches long, with a tail that is 2 1/2 to 5 inches long. The body is light to dark brown, with 13 stripes down its back. The stripes alternate between solid white and dark with white dots. This ground squirrel resembles the chipmunk in size, but the chipmunk has a broad white stripe bordered with black on each side of the body and face. The ground squirrels dig burrows without a mound of soil at the entrance. They spread the soil around and pat it down with their feet and the top of their head. Breeding takes place once a year about mid-April. The babies are born about 28 days later and emerge from the burrow a month after birth.

Thirteen-lined ground squirrels live in short grasslands and weedy areas. This squirrel needs to see over the top of the grass when it stands on its hind legs. Golf courses, cemeteries, parks, roadsides, and airport land are ideal because they are occasionally mowed. Their predators are

hawks, weasels, badgers, dogs and cats. Thirteen-lined ground squirrels eat grasses, weeds, seeds, and crops. They also eat earthworms and insects such as grasshoppers, beetles, and ants.

Badger

Discussion:

A badger's feet and claws are very strong. They have been known to dig their way through blacktop and concrete. They are well adapted to prairie habitat because they can dig through soil full of the tough roots of prairie plants.



Badger fur looks reddish-gray because each hair is white on the tip, black in the middle, and tan near the root. The fur is also tan with a white stripe from their nose down the middle of their back. The body is long, low, flat, and broad. The badger can make noises such as grunts, hisses, squeals, yaps, and purrs.

Badgers live in every part of Illinois except the far southern tip. They live in open country, pastures, prairies, railroad rights-of-way, shoulders of highways, alfalfa fields, and brushy areas. Badgers mate in summer. One to five young are born the next spring. The young are almost bald and their eyes are closed for about one month. Badgers are nocturnal. They feed mostly on mammals that use burrows, such as thirteen-lined ground squirrels, woodchucks, plains pocket gophers, and voles.

Coyote

Discussion:

Coyotes found in Illinois weigh 40 to 50 pounds, which is larger than coyotes found in the western states. Their coat varies in color. They have a blackish stripe down the ridge of the back that continues to the tip of the tail, light gray-brown on the sides, and creamy gray or yellow underside. There is reddish fur behind the ears and on the snout. The coyote molts (sheds) its winter fur every summer. Coyotes make a yapping noise followed by a howl at certain times of the year.



Coyotes live in all parts of Illinois, but they avoid urban areas. They prefer brushy areas at the edges of woods. They also live in the wooded bluffs of the Mississippi River, the hills of southern Illinois, strip-mined lands, and prairies. They dig burrows or dens. Litters of four to nine young are born in April. The male brings food to the nursing female and pups. There are as estimated 20,000 to 30,000 coyotes in the Illinois.

Coyotes eat cottontail rabbits, pigs, poultry, mice raccoons, and occasionally deer.

Bison

Discussion:

Bison, known also as buffalo and Illinois cattle, were plentiful in the 1600s and 1700s. Some Native Americans hunted bison. French explorers wrote about them in their journals.

In 1763 and 1779, there were severe winters with snow over ten feet deep followed by spring flooding. It is thought that thousands of bison died from lack of food and from falling through the ice on lakes and rivers. After that there were fewer bison in Illinois; they disappeared by about 1810. There are no longer any bison living in the “wild” in Illinois, however there are herds of domestic bison.



Bison are brown with a darker brown head, neck, and hump. They are covered with longer coarse hair that forms a beard on the chin and throat. Adult bison are 5 1/2 to 6 feet tall and 10 to 12 feet long from the nose to the tip of the tail. An adult male weighs from 1,600 to 2,000 pounds. A female weighs about 900 pounds. Calves are born in spring and take eight years to mature. Bison live in herds.

Prairie Vole



Discussion:

Prairie voles use postures to indicate behaviors toward enemies or competitors. They signal a threat by raising their forefeet, extending their head forward, and chattering their teeth. Other postures are the upright stand, the lunge, boxing, wrestling, the chase, and retreat.

Prairie voles live in all parts of Illinois in grassy fields that are not too damp. They prefer pastures, alfalfa fields, prairies, and weedy areas. Near towns they live on golf courses and vacant lots. They part the grass at the ground level to make 2-inch wide runways between the entrances to their burrows, or from the burrows to their food source. They also use grass to line their underground nests.

White Tailed Deer

Discussion: Although primarily nocturnal, the White-tailed Deer may be active at any time. It often moves to feeding areas along established trails, then spreads out to feed. The animal usually beds down near dawn, seeking concealing cover. This species is a good swimmer. The winter coat of the northern deer has hollow hair shafts, which fill with air, making the coat so buoyant that it would be difficult for the animal to sink should it become exhausted while swimming. The White-tailed Deer is also a graceful runner, with top speeds to 36 mph, although it flees to nearby cover rather than run great distances. This deer can make vertical leaps of 8 1/2 feet and horizontal leaps of 30 feet. This deer eats 5 to 9 pounds of food per day and drinks water from rain, snow, dew, or a water source. When nervous, the White-tailed Deer snorts through its nose and stamps its hooves, a telegraphic signal that alerts other nearby deer to danger. If alarmed, the deer raises, or "flags," its tail, exhibiting a large, bright flash of white; this communicates danger to other deer and helps a fawn follow its mother in flight. There are two types of social grouping: the family group of a doe and her young, which remain together for nearly a year (and sometimes longer), and the buck group. The family group usually disbands just before the next birth, though occasionally two sets of offspring are present for short periods. Bucks are more social than does for most of the year, forming buck groups of three to five individuals; the buck group, which constantly changes and disbands shortly before the fall rut, is structured as a dominance hierarchy. Threat displays include stares, lowered ears, and head-up and head-down postures. Attacks involve kicking and, less commonly, rearing and flailing with the forefeet. Bucks and does herd separately most of the year, but in winter they may gather together, or "yard up." As many as 150 deer may herd in a yard. Yarding keeps the trails open through the movement of large groups of animals, and provides protection from predators. The leadership of the yards is matriarchal. Deer may occupy the same home range year after year, and may defend bedding sites, but otherwise are not territorial. The White-tailed Deer is less polygamous than other deer, and a few bucks mate with only one doe. The extended rutting season begins at about the time the male is losing his velvet, which varies with latitude. At this time, bucks are still in buck groups, and sparring for dominance increases. (Sparring consists of two deer trying to push each other backward.) The buck group then breaks up, and several bucks begin following a doe at a distance of 150 feet or so. They follow the doe's scent; the largest buck stays closest to the female. A buck attempts to dominate other bucks and may mate with several does over the breeding season. He produces "buck rubs" and also "scrapes," revisiting them regularly during the rut; glandular secretions are left on the rubs. Does visit the scrapes and urinate in them; bucks then follow the trails of the does. A young doe bred for the first time usually produces one fawn, but thereafter has twins and occasionally triplets if food is abundant. The female remains near the fawns, returning to feed them only once or twice a day. Twin fawns are separated, which serves to protect them. Fawns stay with the mother into the fall or winter, sometimes for up to two years, but the doe generally drives off her young of the previous year shortly before giving birth. The Whitetail's first antlers are usually a single spike (the



"spikehorn"). A three-year-old would be expected to have eight points, but there can be more or less, as the number of tines is influenced greatly by nutritional factors. A Whitetail's age is determined not by the number of tines on its horns but by the wear on its teeth.

Eastern Cotton Tail Rabbit

Discussion: The most common rabbit in much of the U.S., the Eastern Cottontail is primarily nocturnal, but is abroad near dawn and dusk and often on dark days. On midwinter nights, groups of cottontails have been seen frolicking on crusted snow. Cottontails usually hop, but they can leap 10 to 15 feet; sometimes they stand on their hind feet to view their surroundings. When pursued, they usually circle their territory and often jump sideways to break their scent trail. They dislike getting wet but will swim if pressed. In winter, where brush is strong enough to hold a covering blanket of snow, they may make a network of runways beneath it. In cold weather, they often take shelter in Woodchuck burrows. This species feeds on many different plants, mainly herbaceous varieties in summer and woody varieties in winter. During the breeding season, males fight one another and perform dance-like courtship displays before the territorial females. These displays involve face-offs and much jumping, including females jumping over males. Individuals often jump straight up into the air, and pairs or small groups often engage in active chases. The young are born in a nest lined with plant material and fur from the mother's breast. The nest cavity, in a hollow in the ground, is about 7 inches deep and 5 inches wide. The top of the nest is capped over with vegetation; nests in lawns are often exposed when lawn mowers take the tops off. The young are nursed at dawn and dusk. Within hours after giving birth the female mates again. If no young were lost, a single pair, together with their offspring, could produce 350,000 rabbits in five years. However, this rabbit's death rate vies with its birth rate; few individuals live longer than one year.



Common Grey Fox



Discussion: Although active primarily at twilight and at night, the Common Gray Fox is sometimes seen foraging by day in brush, thick foliage, or timber. The only American Canid with true climbing ability, it occasionally forages in trees and often takes refuge in them, especially in leaning or thickly branched ones. The Common Grey Fox feeds heavily on cottontail rabbits, mice, voles, other small mammals, birds, insects, and much plant material, including corn, apples, persimmons, nuts, cherries, grapes, pokeweed fruit, grass, and

blackberries. Grasshoppers and crickets are often a very important part of the diet in late summer and autumn. Favored den sites include woodlands and spaces among boulders on the slopes of

rocky ridges. This fox digs if necessary, and it sometimes enlarges a Woodchuck burrow, but it prefers to den in clefts, small caves, rock piles, hollow logs, and hollow trees, especially oaks. Occupied in the mating season, dens are seldom used the rest of the year. The male Common Gray Fox helps tend the young, but does not den with them. The young are weaned at three months and hunt for themselves at four months, when they weigh about 7 pounds. This fox growls, barks, or yaps, but is less vocal than the Red Fox. Other than humans, who shoot, trap, and run over Common Gray Foxes, this species has few enemies. Those include the Bobcat, where abundant, and domestic dogs. Rabies and distemper are important diseases that also kill the fox.

Black Tailed Prairie Dog



Discussion: During the hot summers in most of its range, the usually diurnal Black-tailed Prairie Dog is most active aboveground mornings and evenings, often sleeping in its burrow to escape midday heat. In cool, overcast weather it may be active all day, but it retreats to its burrow to wait out storms. While it does not hibernate, during periods of severe cold or snowstorms this species undergoes a mild torpor and keeps to its burrow for a few days. About 98 percent of the Black-tailed Prairie Dog's diet consists of green plants, including various kinds of grasses, such as grama

grass, bluegrass, brome grass, and, in Texas, burro grass and purple needle grass. It occasionally eats a few insects, especially grasshoppers, and may rarely eat meat. It habitually consumes all the green vegetation around its burrow, not only because it is convenient, but also to clear away protective cover that might shield predators. In the fall, prairie dogs put on a layer of fat that helps them through winter months when food is scarce.

Among the most gregarious of mammals, the Black-tailed Prairie Dog lives in "towns," which may contain as many as several thousand individuals, covering 100 acres or more. The town is divided into territorial neighborhoods, or "wards," which in turn are composed of several "coteries," or family groups of one male, one to four females, and their young of up to two years of age. Sociable animals, Black-tailed Prairie Dogs approach each other, touch noses, and turn their heads sideways to touch incisors; this "kissing" is not a part of courtship but a gesture of recognition and identification among ward members. The animals also groom one another and cooperate in the building of burrows. The burrows have conical entrance and exit mounds, which prevent flooding and serve as vantage points at which prairie dogs often sit on their haunches to survey their surroundings and scan for danger. The mounds are of different heights to facilitate airflow through the burrow. About 3 to 5 feet below the entrance a short, lateral tunnel serves as a listening post and turn-around point, and at the bottom of the entrance shaft, which is up to 14 feet deep, a long, horizontal tunnel features several nesting chambers lined with dry grass, and an excrement chamber. A prairie dog covers its scat with dirt, and as one excrement chamber is filled up, a new one is excavated. The Black-tailed Prairie Dog rarely wanders far from the safety of its burrow. Prairie dogs mate in late winter or early spring. The young, born deaf, blind, and

hairless, don't emerge from the burrow until six weeks of age. They begin fending for themselves at about 10 weeks, and are fully grown at six months.

Like many gregarious mammals, the Black-tailed Prairie Dog is highly vocal. Studies with a sound spectrogram indicate that it has nine distinctive calls, including chirps and chatters much like those of a tree squirrel; snarls, used when fighting; squeals of fright; and a shrill bark that gives this animal its common and genus names (*Cynomys* comes from Greek words meaning "dog mouse"). A staccato, double-noted call consisting of a chirp followed by a wheezing sound and accompanied by tail flicking is an alarm signal; it is chorused by other prairie dogs before all dive for safety. The "jump-yip" display, in which the prairie dog leaps into the air with head thrown back and forelegs raised as it gives a wheezing, whistling yip, seems to be an all-clear signal; this is also picked up by other prairie dogs, and soon the whole community is jumping and yipping.

The average life span of the Black-tailed Prairie Dog is seven to eight years. In the past, prairie dog towns covered vast expanses of the Great Plains. After great numbers of American Bison were killed, the use of the prairie for agriculture and grazing allowed a prairie dog population explosion. However, as the rodents competed with cattle for grass—250 prairie dogs can consume as much grass each day as a 1,000-pound cow—they became the object of such fierce extermination campaigns that their numbers declined by more than 90 percent (which, in turn, led to the decline in numbers of their chief predator, the Black-footed Ferret which is now endangered). Now foxes and the American Badger are this prairie dog's chief predators, but Coyotes, Bobcats, eagles, hawks, and snakes also take a share. In some areas, ranchers still attempt to eliminate prairie dogs with cyanide. However, a balanced population of the animals (controlled by predators, sport hunters, and modern methods of habitat modification) can actually improve rangeland, and today many ranchers take pains to maintain dog towns instead of eliminating them. Prairie dog meat once provided food for Native Americans and early settlers.