

# Chapter 4

## TERRESTRIAL HABITATS

Terrestrial habitats in Fort Collins consist of the shortgrass prairie, and upland shrublands and forests. Most occurrences of this type of habitat are in or near the foothills and in the inner city. Each of these habitat types may contain aquatic components.

### Shortgrass Prairie

#### Definition

Grasslands are comprised of unmowed naturalized grasses mixed with forbs (up to 50%). Canopy coverage of woody plants is less than 25%.

#### Ecology

Grasses dominate the landscape of the prairie. Grasses evolved about 95 million years ago, but not until 25 million years ago did they truly flourish. During the Miocene, temperatures became cooler, and the climate became drier. As the Rocky Mountains uplifted, they blocked the winds blowing east from the Pacific. The winds dropped their moisture on the western slopes of the mountains, consequently, the eastern slopes and Front Range of our state became drier and drier so that trees dwindled and grasses slowly increased. With the changing conditions, the forests that had ruled the terrain for millions of years, had to yield to the drought-tolerant grasses.

The plants and animals of the shortgrass prairie must endure blistering heat, almost constant winds, heavy grazing by various herbivores, fires, and a long, cold winter.

The prairies within a narrow band east of the Rocky Mountains are the driest of the Great Plains. Our area receives an average of only 14 inches of moisture each year, often much less. Seasonal high winds evaporate much of this precipitation creating dry conditions suitable for the short grasses. The lands to the east of Colorado emerge from the rain shadow of the Rocky Mountains and receive much more moisture. These lands supported the tallgrass prairie of which only remnants remain.

There are two general classes of grasses on the shortgrass prairie: bunch forming and sod forming. Bunch grasses increase from new stems arising from dormant buds at lower nodes and projecting up between stem and sheath. Sod grasses spread by above ground runners called stolons, or by underground rootstocks called rhizomes. Grasses that have maximum production in the summer are warm-season grasses, those that have maximum production in the spring are cool-season grasses.

Grasses are distinguished by their structures. They are herbaceous with rounded or flattened stems called *culms*, which are solid at the joints called *nodes*. Leaves are two-ranked, alternate, and parallel veined. Leaves are composed of the sheath which surrounds the stem but is split down one side, and the blade which is the extended strap shaped part. At the junction of the sheath with the blade on the inside it has a hairy or membranous projection called the *ligules*. There may be a clasping ear-like structures projecting around the stem called *auricles*.

Grasses grow gigantic shallow root systems to survive the dry conditions. To withstand constant pruning by bison, elk, pronghorn, deer, cattle, and prairie dogs, grasses adapted by growing from their base instead of their tips. When the tip of the leaf is eaten, growth continues from below and the leaf reaches or surpasses its former size.

Most grasses are pollinated by the wind, a constant companion on the prairie, thus have no need for colorful petals to attract insects or birds. The seeds are shaken by the wind and blown from place to



place and are buried by drifting soil. Grass seeds provide food to countless animals such as mice, ground squirrels, prairie chickens, ants, and numerous sparrows. These animals carry and drop the seeds, thereby aiding dispersal.

The young prairie grasses must hurry into the growth cycle -- three or four consecutive days of continuously moist surface conditions are necessary for the roots to penetrate enough to become established. If the grass is an annual it will reach maturity, produce seed and die within a few weeks or months. If it is a perennial it may be as much as five years before it reaches full root and shoot development. Perennials of the prairies tend to be long-lived, even to 50 years old.

In addition to numerous grasses, a large diversity of forbs are found on the shortgrass prairie. The forbs of the prairie grow deep branched taproots and don't compete with the shallower rooted grasses.

Grasses and forbs provide high nutritional forage for numerous herbivores. In general, herbivores are selective eaters, and maximum preference and use of forage coincides closely with succulence and maximum nutritional quality of the vegetation.

Very few trees exist on the prairie. Only where water is in frequent supply can trees be found.

Animals of the prairies have adapted strategies for survival in this open landscape. Predators stalk their prey from afar and prey can see their predators well in advance. Prairie animals have the keenest eyesight of any animals.

Most prey species of the prairies have developed a social structure that serves to protect them from predators. Prairie dogs whistle, chirp and bark to communicate to each other. They burrow to escape predators and the extremes of temperature. Bird song is loud and clear and carries farther than in the forests. Many prairie birds sing on the wing because of lack of perches. Most prairie birds nest in shallow scrapes on the ground, which makes them vulnerable to trampling.

## Shrublands and Forests

### Definition

Shrublands consist of at least 25% shrubs coverage, and are located on the plains or along the foothills.

Our urban forests consist of stands of trees greater than one-quarter acre with at least 30% canopy coverage and located at residences, urbanized parks and cemeteries, or farms. Deciduous species may be dominated by cottonwoods, but introduced species are usually also present. The understory is typically sparse, and is

often mowed grasses.

In the undisturbed forest the tree canopy coverage is at least 30%. The dominate tree species in Fort Collins are the plains cottonwood and ponderosa pine depending on the location.

### Ecology

Establishment of cottonwood in the upland forest depends on wet conditions, even if only for a brief period. Continued growth depends on a relatively high water table until the roots reach can lower water tables.

Ponderosa pine colonize areas that are hot, dry, and sunny. The roots may extend down 30 feet and creep out as far as 100 feet on either side of the trunk which gives it an extraordinary resistance to drought. These trees take advantage of dew by capturing the water through leaves and transporting it to the roots. The trees are widely spaced, giving stands of ponderosa an open park-like atmosphere. The more open the pine stands the more lush the undergrowth. Grasses, sedges, forbs, and shrubs under the trees provide food and cover for numerous species. During the



summer when grasses are dry and brittle, the areas under ponderosas are still green and beckoning, and provide much needed forage.

With the advent of colonization, ponderosa stands have changed dramatically. Fire suppression caused young seedlings to grow into dense thickets. The ponderosa stands of this era are still dense and shady. Seedlings of ponderosa are not as shade tolerant as other species such as Douglas fir. As the old ponderosas die they are being replaced by Douglas fir.

## Terrestrial Habitats and People

The prairies provide us with a link to our past. Much of this country was dominated by prairie, one of the richest ecosystems on earth. White settlers misunderstood its ecology and eked out a sometimes meager living here.

## Impacts and Issues Associated with Terrestrial Habitats

A prevalent attitude that has resulted in the devastation of prairies is the perception that they are “vacant land” or “empty.” The prairies do not boast dramatic towering peaks like the mountains, nor do they support many trees or shrubs; thus, are more difficult to preserve. Many people think of prairies as wasted space if no houses, cattle, or crops are on them. In reality, the grasslands support an extraordinary diversity of plant and animal species. Even a brief investigation soon reveals this fact.

