NATURE DETECTIVES

Summer 2007

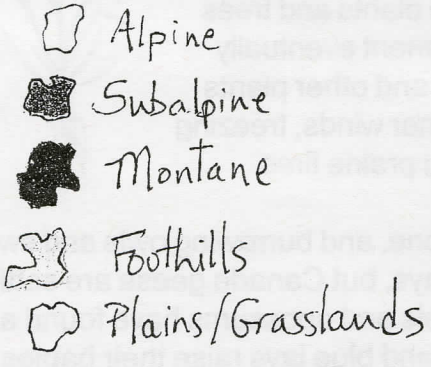
Pull Out and Save

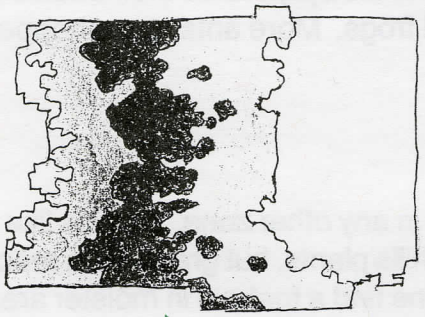
Life in the Zone

In nature, vegetation doesn't grow willy-nilly, here and there. Plants grow grouped with other plants that thrive in similar growing conditions. Studies show that plant locations strongly depend on climate, especially temperature. Over a hundred years ago, a nature scientist named Charles Merriam observed that plants growing in wildlife communities near the tops of mountains were the same species growing near each other far to the north toward the Arctic. Similar plant groups, though growing in different places, provide habitat for some of the same animal species, too. Merriam called these wildlife communities **life zones** and so do scientists today.

More Life Zones = More Types of Wildlife

Life zones are identified by the main kinds of plants living in each zone. There are five life zones in Boulder County, creating habitat for an amazing variety of plants, animals and other wildlife. It is easy to see the dramatic changes in vegetation that define the five zones as you climb from lowlands to the mountains.





Life Zones Map of Boulder County

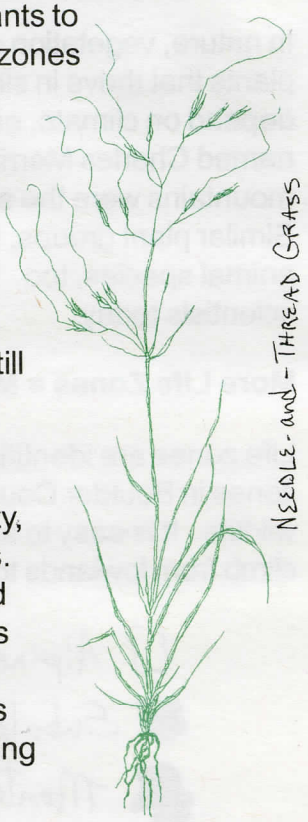
Average temperatures get colder as you ascend mountains. Similarly, as you travel north toward the Arctic, average temperatures cool gradually. Average temperatures drop much quicker going up mountains compared to driving north. You'd have to travel a long way north to see the life zones that occur as our County rises abruptly from flat rolling hills to high peaks. In only twenty miles from east to west in Boulder County, we see changes in vegetation communities that we'd see if we drove thousands of miles to Alaska.

Because the life zones in our area rise uphill, they form bands of vegetation like giant belts around the mountains. But, unlike belts, the edges are not straight lines. Zones zigzag into neighboring zones where differences (such as more sun or more shade, more or less shelter from the wind, more or less moisture, loamy or sandy soil) affect growing conditions. Things like forest fires can also change zone shapes. As climates change over time, life zones change too.

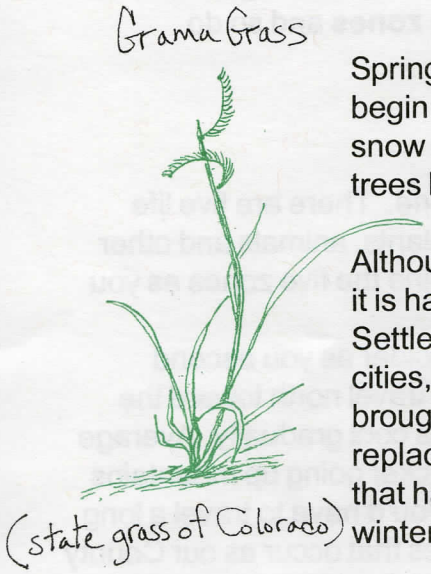
A Tale of Two Treelines

Moisture and wind are almost as important as temperature to life in the zones. At the highest elevations, wildlife face the coldest average temperatures plus strong winds. Though it snows quite a bit in the top zone, much of the snow blows off so plant roots find scant moisture. It is too much for trees; they can't grow under such harsh conditions.

At the other end, down at the lowest zone in our area, the temperatures are warmer, but sudden changes in temperature occur in this zone, making it tough for plants to cope. Dry winds and the least amount of rain and snow of any of the five zones combine to wilt young trees. Native trees take hold only next to streams, ponds, ditches or other water.



Life in the Zones – Plains/Grasslands Zone (Below 5500 Feet in Elevation)



Spring starts earliest on the plains. Flowers here begin blooming while the high mountain plants are still snow covered. Plains cottonwood trees and willow trees leaf out long before their mountain cousins.

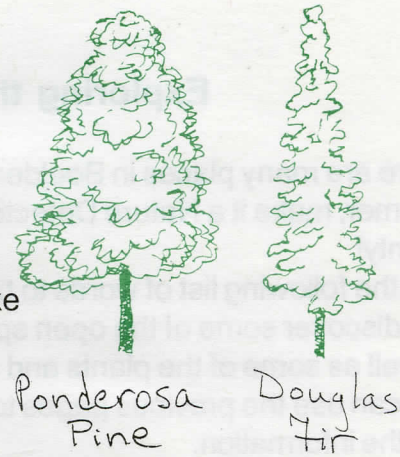
Although this is the widest life zone in Boulder County, it is hard to find natural prairie grasslands nowadays. Settlers dug up the prairie to build homes, farms and cities, and they cultivated non-native plants and trees brought from their old homes. Settlement eventually replaced most of the native grasses and other plants that had thrived despite drying summer winds, freezing winter blizzards and lightning-ignited prairie fires.

The bison that roamed the plains in huge numbers are gone, and burrowing owls and swift foxes are struggling to find enough space to live these days, but Canada geese are settling into new habitats near man-made reservoirs. Fox squirrels and opossums have found a home in this zone. Cottontail rabbits, black-tailed prairie dogs and blue jays raise their babies here. This is a good zone for finding snakes, turtles, lizards, and frogs. More ants, grasshoppers and ground beetles live here than in any other zone.

– Foothills (5500 to 8000 Feet in Elevation)

More species of plants and wildlife live in the foothills than in any other zone. Shrubs like mountain mahogany and three-leaf sumac are typical foothills plants, but grasslands reach into this bushy zone from below, and forests from the upper zone find a toehold in moister areas.

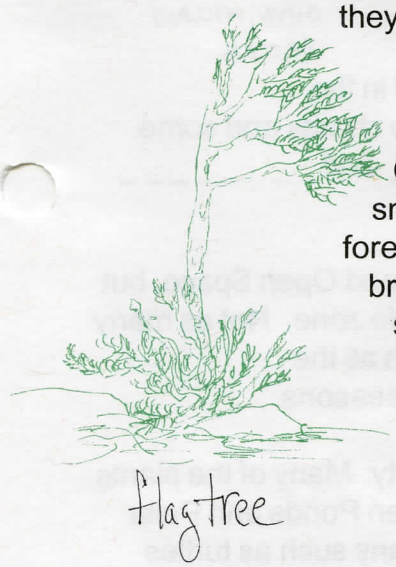
The large variety of plants provides choice habitat for critters including chipmunks, black bears, gray foxes, rock squirrels, scrub jays, mountain lions and many more. Most of the animal species living in the zone below and the zone above can find homes here, too.



– Montane (8000 to 9500 Feet in Elevation)

Several different types of forests define this woodland zone. On sunny, dry slopes, ponderosa pine trees flourish. Where the slopes are higher, cooler or shadier, Douglas fir trees take over. Other places, lodgepole pine forests grow tall. Grassy mountain meadows appear here and there, and broadleaf trees such as aspen find good habitat along waterways.

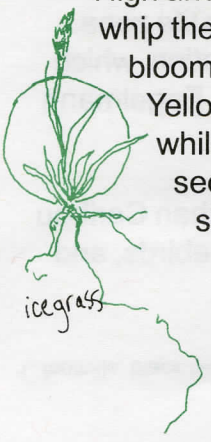
Western bluebirds and pygmy nuthatches build their nests in montane woods. Some inhabitants of this zone migrate to different zones with the seasons. Mule deer, elk and coyote tend to go to higher zones in summer and travel down to lower zones during the cold, snowy winter months. Other animals travel between zones sort of like people drive to jobs from homes miles away. Commuting golden eagles roost on high cliffs but soar over the plains looking for a rabbit meal. Red foxes and many other animals are adaptable and can find homes and food in almost any zone. Dippers, the little birds that walk stream bottoms, can live near creeks from treeline to the plains. But, Abert's squirrels stay put in the ponderosa forests; they depend on these montane trees for shelter and food.



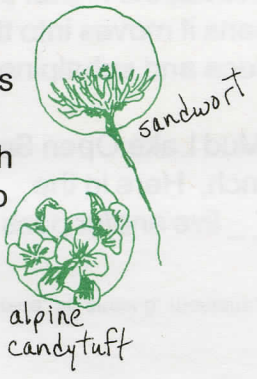
– Subalpine (9500 to 11,500 Feet in Elevation)

Cool and wettest of any zone, the subalpine gets most of its moisture as snow. Engelmann spruce trees and subalpine fir trees make up the shady forests of this woodland zone. Higher up, limber pines droop their flexible branches to shed heavy snow layers. At the highest edge, the trees are shrub-sized, slow growing and shaped by icy winds. Their stunted branches face away from the wind like flags. These flag trees form the treeline, the upper limit for tree survival. Subalpine forests are filled with sounds: chickadees dee-dee-dee-ing, pine squirrels chattering, woodpeckers hammering, and pine grosbeaks cracking seeds.

– Alpine (above 11,500 Feet in Elevation)



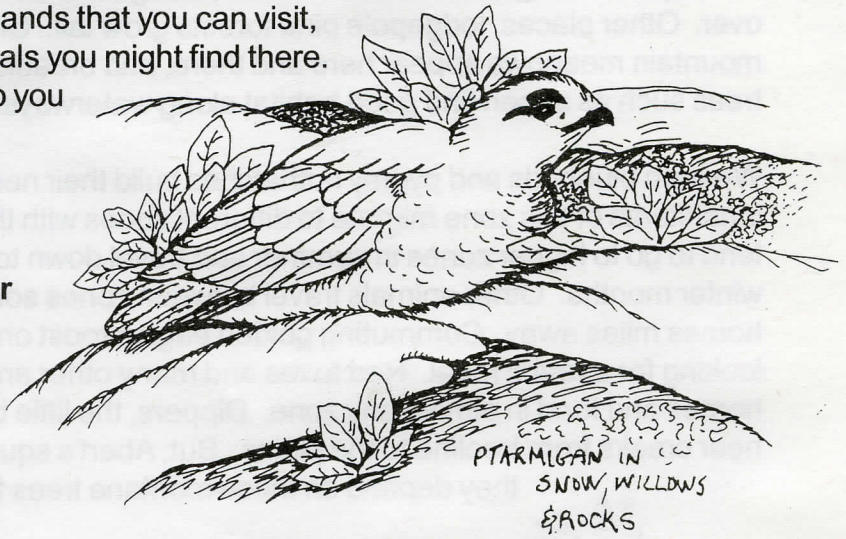
High and dry, though it snows and snows in the alpine zone, icy winds whip the snow away. Low shrubs and short plants cling to life, rushing to bloom in a dramatic burst of flowers from June into early July. Yellow-bellied marmots are alert for hungry eagles and foxes, while elk seem to enjoy lying on the cool ground. Rosy-finches seek insects and seeds, and pika make hay while the sun shines. Ptarmigan replaced their snowy-white feathers with brown and white to match summer's rocky ground. All too soon, yellow leaves signal fall arriving first to the alpine zone, while summer is still in full swing on the plains.



Exploring the Life Zones of Boulder County

There are many places in Boulder County where you can go to explore the life zones. This summer, make it a Nature Detectives challenge to visit each of the life zones in Boulder County!

Use the following list of words to fill in the blanks in the sentences below, and discover some of the open space lands that you can visit, as well as some of the plants and animals you might find there. You can use the previous pages to help you find the information.



WORD LIST

frogs	**foothills**
mountain lion	**black bear**
alpine	**plains**
grasses	**meadow**
ptarmigan	**elk**
subalpine	**snow**
montane	**fir**

1) Heil Valley Ranch and Rabbit Mountain Open Space are both located in the _____ life zone, which is where grasslands start to give way to shrubs and some trees. This life zone is home to many animals such as _____ ____ and _____ ____

2) Brainard Lake Recreation Area is not a part of Boulder County Parks and Open Space, but it's a good place to visit if you want to get way up high in the _____ life zone. Not as many animals live up here, but the ones who do have special adaptations, such as the _____, a bird that changes color from brown to white with the seasons.

3) The _____ life zone is considered the widest life zone in the county. Many of the plants that grow here are _____. Pond and wetland areas such as Walden Ponds and Pella Crossing are a good place to see many kinds of birds, and find amphibians such as turtles and _____.

4) At Caribou Ranch Open Space, you will be mostly in the montane life zone as you hike the trails, and you can see an open mountain _____ that is characteristic of this life zone. However, the higher parts of the Caribou property are around 9,500 feet in elevation, which means it moves into the _____ life zone. This is where trees such as Engelmann spruce and subalpine ___ grow, and much of the moisture falls as ____.

5) Mud Lake Open Space, in Nederland, is located at a slightly lower elevation than Caribou Ranch. Here in the _____ life zone, animals such as coyote, western bluebirds, and ___ live and/or pass through as they move higher and lower with the seasons.

1. foothills, black bear, mountain lion 2. alpine, ptarmigan 3. plains, grasses, frogs 4. meadow, subalpine, fir, snow 5. montane, elk