

FOOTHILLS CANYONS
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1. ORIGIN

What forces shaped the colorful foothills canyons? The present Rocky Mountains were pushed up 70 million years ago. The uplift did not happen all at once, but occurred by stages. The most recent period of mountain building along the Front Range was 5-7 million years ago when existing peaks and plains were lifted an additional 4000 to 5000 feet, establishing the general shape of the land as it appears today. The force of gravity opposes the upward force of the mountains, pulling water, soil, and sediments downward. As rivulets gather to make streams, the water's power increases, carving ravines and canyons as rock is worn away. The erosive power of water sculpts the finer details of the landscape.

2. DESCRIPTION

Foothills canyons are green, leafy ribbons cutting across the dramatic edge of two major ecosystems, the Southern Rocky Mountains and the Great Plains. Canyons connect mountain and grassland. A rich tangle of deciduous trees and shrubs thrives in canyons which could not survive in dry, windswept places.

Canyons also define the edge between the shadier north-facing slopes where Douglas-fir is mixed with ponderosa pine and the warmer, drier south-facing slopes with open patches of ponderosa pine and occasional Rocky Mountain junipers, and a profusion of wildflowers.

Life at the edge of edges produces a complicated mosaic of habitats which gives wildlife many choices for food and cover. Voles build grassy tunnels in bits of meadow, while pocket gophers tunnel in the soil underneath. Stellar's jays fly from the evergreen forest to the streamside willows. Towhees scratch noisily for insects in shrub litter while flycatchers catch insects on the wing. Warblers and kinglets poke and search for insects on buds, leaves, and twigs. Cooper's hawks swoop down through the trees searching for small birds. Marmots and lizards sun on boulders while chipmunks and rock mice seek cover in talus.

Canyons are corridors of activity. Water and nutrients move downward. Wildlife moves back and forth looking for food, mates, and shelter. Native Americans followed game trails along the streams reaching from the plains to the high country. Settlers widened these trails into roads. And now, we have built highways in larger canyons and hiking trails in many of the smaller canyons.

Foothills Canyons
OSMP Studies

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Study



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3. CLIMATIC FACTORS

Water is the precious, limiting resource in the rainshadow along the eastern edge of the Front Range. Cool, moist canyons offer respite from sun and wind. A mantle of mist often drifts against the foothills and settles into the canyons. The humid, sheltered microclimate is a refuge for certain plants which grew in Colorado at the time the Pleistocene glaciers receded more than 10,000 years ago. Beaked hazelnut, wild sasparilla, and black snakeroot are examples of plants which survived in shady ravines and canyons when the surrounding climate warmed.

4. LIST OF TYPICAL PLANTS

Canyon bottom

- *plains cottonwood
- *narrow-leaved cottonwood
- *peach-leaved willow
- boxelder
- *river birch
- *alder
- aspen
- sandbar willow
- mountain ash
- *plum
- *chokecherry
- hazelnut
- hawthorn
- ninebark
- yellow currant
- skunkbush sumac
- smooth sumac
- snowberry
- Rocky Mountain maple
- wild raspberry
- boulder raspberry
- red-twig dogwood
- wild grape
- Virginia creeper
- western virgin's bower
- Rocky Mountain clematis
- smilax
- poison ivy
- horsetails
- bracken
- male fern
- ladyfern
- cow parsnip
- sweet cicely
- false solomonseal
- scarlet paintbrush
- Rocky Mountain columbine
- twisted stalk
- enchanter's nightshade

lovage
shooting star
baneberry
beebalm

Some shrubs and trees have grown from seeds carried from gardens
to the canyons by birds and mammals:

Tartarian honeysuckle
barberry
viburnum
cotoneaster
privet
apple
green ash

Canyon sides

*ponderosa pine
*douglas-fir
*Rocky Mountain juniper
wax currant
yucca
creeping hollygrape
kinnikinnick
common juniper
mouseear
mountain bladderpod
stonecrop
leafy cinquefoil
golden aster
blanket-flower
evening primrose
creeping phlox
nodding onion
yellow violet
spring beauty
blue flax
harebell
lance-leaf chiming bells
wild geranium
western spiderwort
one-sided penstemon
blazing star
western wallflower
lupine
prickly-pear
little bluestem
blue grama

5. LIST OF TYPICAL FAUNA

Birds

golden eagle
prairie falcon

kestrel

*accipiters--goshawk, Cooper's hawk, and sharp-shinned hawk

red-tailed hawk

turkey vulture

owls--great horned, screech, pygmy

robin

swallows--tree and violet-green

*vireos--warbling, solitary

*warblers--MacGillivray's, Virginia's, yellow

kinglets--ruby-crowned, golden-crowned

buntings--lazuli, indigo

grosbeaks--evening, *black-headed

magpie

raven

wren--*canyon, house

broad-tailed hummingbird

juncos

jays--Stellar's, scrub

pine siskin

goldfinches--American, lesser

*towhees--rufous-sided, green-tailed

western tanager

flycatchers

woodpeckers--flicker, yellow-bellied sapsucker, hairy, downy

chickadees--black-capped and mountain

Western wood peewee

Mammals

mountain lion

bobcat

*black bear

*coyote

*foxes--red and gray

*raccoon

porcupine

striped skunk

long-tailed weasel

deer--mule, occasional white-tailed

*shrews--masked, montane, dwarf, water

bats--little brown, small-footed myotis, big brown

Nuttall's cottontail

black-tailed jackrabbit

chipmunks--least, Colorado

yellow-bellied marmot

squirrels--rock, fox

golden-mantled ground squirrel

mice--deer, rock, jumping

woodrats--Mexican and bushy-tailed

voles--heather, meadow, montane, long-tailed

pocket gopher

Herps

Not much expertise here! But one species is of special interest--occasional sightings of milk snakes have been made in

foothills canyons. The most recent one was August, 1989 when a climber came face to face with a western milk snake while climbing the Amphitheater formation in the mouth of Gregory Canyon. This beautiful, non-poisonous snake is bright red with yellow and black markings which at first sight may look like a coral snake, but the yellow and black bands are reversed. Eastern fence lizards are frequently sighted on rocks in the canyons.

Amphibians:

boreal chorus frog
Rocky Mountain toad

Reptiles:

In The Natural History of the Boulder Area, the foothills canyons are described as particularly interesting for the distribution of snakes:

plains garter snake
red-sided garter snake
western milk snake
northern water snake
eastern yellow-bellied racer
bullsnake
prairie rattlesnake

red-lipped rock lizard (the only reptile or amphibian confined
the foothills ecotone)
eastern short-horned lizard

Invertebrates

Mountain Parks does not have an inventory of insects and other invertebrates for the foothills canyons, but a study would be immensely valuable. The rich riparian habitat supports an abundant insect fauna which becomes an important element in the complex food webs of the canyons. For example, foothills riparian habitats support over 100 species of butterflies, more than any other habitat type according to F. Martin Brown. And other interesting insects occur at the edge of the foothills, including two small mantids and a walking stick. Here again, there are many opportunities (niches) for insects and other invertebrates, including the water itself for the many kinds of aquatic insects, as well as trees, shrubs, forbs, and soil.

6. CHARACTERISTIC CYCLICAL PATTERNS

The moisture cycle of the canyons varies with seasons and daily climatic variations. The streams of larger canyons are perennial, leading from tundra snowfields to the plains year round. Spring fed drainages stay moist year round as well, but other small drainages may be ephemeral, drying during times of low rainfall.

Flooding can occur during spring run-off of following

violent summer thunderstorms. Flooding and mudslides are more common following natural or human disturbance such as fire, logging, or roadbuilding.

One of the most aesthetic cycles is the leaf cycle. Tender, green spring leaves become the many green shades of summer, ending in a blaze of various bright colors with the cooler nights of fall. As the tree prepares for winter, chlorophyll pigments decrease in the leaves, unmasking orange, red, yellow, and brown pigments just before the leaves fall.

7. ADAPTATIONS OF FLORA

nettles--stinging hairs may help prevent grazing of this edible plant--but not by painted lady butterfly caterpillars!

prickly pear cactus--the numerous stamens move the center when touched by a pollinator (or person)

vines--such as wild grape, Virginia creeper use rocks or other plants for support

fruits and berries--mammals and birds eat the flavorful fruit but the seeds survive the digestive process and are deposited with a bit of compost besides. Some seeds such as hawthorn, benefit from the digestive acids which break down the hard seed coat assisting germination.

leaves--deciduous leaves are a winter adaptation. Leaves are relatively expensive to the plant in terms of water loss to the plant through stomates and from the leaf surface. Many trees of temperate climates lose their leaves and become dormant during the coldest months when the ground is often frozen and water is less available.

8. ADAPTATIONS OF FAUNA

accipiters--the goshawk, Cooper's hawk, and sharp-shinned hawk have short, round wings which allow them to fly rapidly through trees looking for small perched birds

water shrew--this large shrew has feet lined with stiff fringed hairs will allow it to scamper across the stream, literally "walking on water"

ouzel--not confined to foothills riparian, but adapted to underwater searches (this animal walks under water) of insects of swift moving streams

caddis flies--one kind of insect the ouzel seeks designs its own camouflage home by gluing bits of the stream substrate to its larval case so that it looks like little twigs or just some gravel--but watch, they move!

caddis flies--some caddis flies build a miniature net on rocks or twigs in streams to snag microorganisms--the larva comes out of its attached case to clean the net for supper

9. ROLE OF NATIVE AMERICANS

Native Americans have been in the Boulder area for about 11,000 years. We know that in the last century the foothills canyons were an important part of the hunting/gathering lifestyle of the Arapahoes. Winter camps were built near the water and shelter of the foothills canyons. They followed the game trails and found many plants useful for food, fiber, and healing:

- food--chokecherries were ground and added to dried meat and fat known as pemmican--protein, calories, and vitamins which prevented scurvy. Currants and serviceberries were also used. The food plants of the canyons are numerous. Some include wild grapes--made into raisins, rose hips and raspberries, juniper bark and berries during lean times. Wild onions added flavor to meat.
- fiber--cord came from wild flax, dogbane, and yucca
- furnishings--Arapahoes furnished tipis with raised beds with willow head- and footrests. Cradles were fashioned from chokecherry.
- weapons--cottonwood provided wood for bows
- glue and waterproofing--pine pitch
- dye--many plants were used for dyeplants, one of the most interesting was sunflower hulls used to dye porcupine quills for clothing decoration. The Arapahoes were well-known for their excellent quillwork. The beepplant was both an important food plant for many tribes and gave a black dye used for pottery
- recreation--plum pits were used for a dice game; the snow snake was a game played by sliding willow rods capped with a bison horn in the snow.
- ceremonies--kinnikinnick and red-twig dogwood bark were used or mixed with tobacco

10. IMPACT OF EUROPEAN SETTLERS

Foothills canyons were historic migration routes for animals such as elk and bighorn who moved between the plains and tundra each winter and summer. Settlement and the construction of roads in canyons disturbed this ancient pattern, confining these animals to the higher mountains. Occasionally, elk still find a quiet way to wander onto the plains. Fox squirrels have moved up streams across the plains and into foothills canyons from eastern states in recent times. How does this invasion affect the squirrels--Abert's squirrel, rock squirrel, and chickaree?

New species have come to the canyons, but since the relatively short time of settlement, many others are now gone from the area including the grizzly, lynx, wolf, moose, otter, and quite recently, the wolverine. The loss these animals affects the entire community of organisms.

The first road constructed from Boulder to the mountain mining camps was built in Gregory Canyon. John Gregory needed a route to supply materials to his Black Hawk mine. This steep road was no luxury highway--even after improvements were made in the 1860s, it was necessary to lower wagons from one part of the

road to another with block and tackle!

Although homes were built in foothills canyons and small patches of land were farmed, the narrow valleys and threat of flooding limited development. Settlement impact was much less the vast changes perpetrated on the plains. However the heavy impact of road and trail use continues.

11. RESTORATION

Foothills riparian habitats are among the most diverse of Front Range habitats--they are wild treasures. Although the lower canyons are somewhat protected by topography and sometimes protected by governmental planning, we need to make every effort to protect them from further intrusion and disruption.

The growing population along the Front Range places pressure on this habitat with increasing needs for transportation and recreation. Very few canyons are without road or path. Wildlife depends on the cover of streamside vegetation--we can't be sure what further effects human intrusion have. It is imperative to protect the unlined canyons and ravines which remain. If trails must be built, wildlife is helped if the trail is located away from the drainage, coming into and out of the stream corridor as rapidly as possible.

12. FOOTHILLS CANYONS BY SEASONS

January-March

- icicles, frost patterns
- sugar-frosting trees
- stories in tracks
 - porcupine swath
 - mountain lion/deer kill
 - delicate mice tracks
 - bounding tracks of rabbit and squirrel
- great-horned owls nest early--January or February
- ladybugs start to come down from the peaks in March
- the first mountain bluebirds return in March
- overwintering adult butterflies such as mourning cloaks and anglewings fly about on warm days returning to shelter at night or during cold days

April-May

- April--wild plum blooms, fragrant white blossoms before the leaves
- by mid-May, flowering shrubs make display
- warbler wave
- other migrant birds return
- tick time
- wildflowers and early butterflies
- tent caterpillars make large communal nests in chokecherry, starting in April
- hummingbirds return from winter vacations as early as April
- sleepy marmots leave hibernation dens to sun on rocks

June-August

raptors fledge young--golden eagles, prairie falcons
bird songs are rich and varied as nesting birds define and defend territories
colorful butterflies fly up and down the canyons--large, orange fritillaries float about the beebalm; black and white Weidemeyer's admirals lay eggs on willow and cottonwood leaves; large yellow tiger swallowtails look for willow and cottonwood as well as chokecherry leaves
look for butterfly "puddle clubs," bachelor groups of some butterflies gather at the edge of mud puddles sipping minerals from the moist soil--sometimes dozens of blues will gather at a small puddle unnoticed until they flash brilliant blue wings
leaf galls are common on leaves and stems of many plants-- look for galls on chokecherry and hackberry leaves
dragonflies set up territories and chase intruding dragonflies
listen for the metallic sound of male broad-tailed hummingbirds in flight and look for diving circle loops performed for prospective mates

September-October

*brilliant foliage--shrubs and vines turn scarlet, burgundy, orange, clear yellow--skunkbush and smooth sumacs, Virginia creeper, poison ivy, plum, hawthorn, wild rose, aspen, birches, wild geranium, currants, and others
*edible plants which are related to the following:
*bear sightings common as chokecherries, apples, and hawthorns ripen
look for bear sign--tracks in mud or shaley patches and scat deposited on trail easily recognized by size and chokecherry seed content. Scat seen this September illustrated the omnivorous nature of the bear diet. In addition to numerous chokecherry seeds, a piece of snake was found, and inside the snake were the remains of a mouse it had eaten--interesting food chain!
robins feast on chokecherries (are these orgies?)
on misty fall days before heavy frost, look for the lacy patterns of spiders' webs edged with dew

November-December

colors are now more quietly beautiful--gray, rust, tan, and straw--red-twig dogwood, however, turns a brilliant scarlet color
bare twigs make interesting patterns
birds' nests now more apparent--look for the nests of warbling vireos woven over the crotches of river birch and alder branches. The domed nests of magpies remain in willows or cottonwoods
stem galls noticeable--especially rose, willow, goldenrod
interesting forms of dried seed heads sometimes etched with frost

tree squirrels are active even on cold snowy days, but
chipmunks, ground and rock squirrels, marmots, and
bears are sleeping
great horned owls often call
canyons offer shelter from the blasts of wintry winds

12. WHERE TO SEE FOOTHILLS CANYONS

Boulder, Fourmile, Sunshine, Lefthand, and Saint Vrain Canyons are accessible by car. Explore the canyons of Boulder Mountain Parks by footpaths. Each canyon--Shadow, Fern, Bear, Skunk, Bluebell, Gregory, and Long--has its own feeling and character. Eldorado Canyon which contains South Boulder Creek can be hiked from the state park, along the edge of Mountain Parks to the vicinity of Walker Ranch, a County Parks and Open Space Property on Flagstaff Mountain. Another County Parks trail goes along Fourmile Canyon Creek from the Bow Mountain subdivision.

13. SUGGESTED READING

McPherson, A. and S. McPherson. 1979. Edible and useful wildplants of the urban West. Pruett Publishing Co., Boulder, 330 pp.

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