

IMAGES

NEWS PROPERTIES NATURE HISTORY EVENTS



IMAGES

The mission of the Boulder County Parks & Open Space Department is to conserve natural, cultural and agricultural resources and provide public uses that reflect sound resource management and community values.

PHOTOGRAPHS & ILLUSTRATIONS

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Long's Peak, Mike Lohr

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NATURE DETECTIVES

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Hemp Happenings at Parks & Open Space

By Vanessa McCracken

Industrial hemp is popping up on Boulder County Open Parks & Space agricultural properties. What exactly is hemp, and why now?

The federal farm bill definition of “industrial hemp” means a plant of the genus *Cannabis* and any part of the plant, whether growing or not, containing a delta-9 tetrahydrocannabinol (THC) concentration of no more than three-tenths of one percent (0.3 percent) on a dry weight basis.

Industrial hemp, also called hemp, is the same species as marijuana (*Cannabis sativa*) but has lower concentrations of THC and higher concentrations of cannabidiol or CBD, which decreases the psychoactive effects. Hemp is grown specifically for the industrial uses of its derived products.

PLANT OF MANY USES

Different end uses are typically produced with different genetic strains bred to deliver specific outcomes. Hemp genetics are designed to produce or optimize end uses like CBD vs. fiber. The fiber, seeds, and oil can be made into hundreds of products.

The stalks produce an outer ring of bast fibers and an inner ring of hurd fibers that are made into paper, textiles, fabrics, rope, canvas, carpets, twine, cord, and building products, among other things.

The leaves, flowers, and seeds can be processed into CBD for food products, oils, gels, tinctures, capsules, salves, fuels, paints, and lubricants.

CULTIVATION

Hemp cultivation techniques vary based on what plant parts are going to be harvested. Hemp is an annual broadleaf that grows quickly. In Boulder County, farmers grow hemp primarily for CBD production. Hemp is planted from seed or transplanted into the field. Some producers choose to plant into black plastic for weed barrier, others plant directly into the soil with no weed barrier. Irrigation techniques vary as do seed sources, planting spacing, planting density, weeding methods (mechanical or manual), and harvest methods (again, mechanical or manual).

ANOTHER KIND OF GOLD RUSH

The hemp industry in Colorado has been described as “The Wild West” or a modern day “Gold Rush.” Anyone growing hemp or looking to enter the industry is encouraged to very carefully vet all business relationships. More information can be found in the press release from Colorado State University: Industrial Hemp Production: A Risk Assessment at www.thefencepost.com/news/industrial-hemp-production-a-risk-assessment/.



Hemp is cultivated on some open space agricultural lands.

HEMP THROUGH HISTORY

The legal history of hemp is long, complicated, and surprisingly difficult to uncover. For thousands of years people cultivated hemp and used the plant for many purposes.

Some highlights:

- 1937 - The Marijuana Tax Act strictly regulated and levied taxes on the cultivation and sale of all cannabis varieties, including hemp.
- 1940s - The United States Department of Agriculture's "Hemp for Victory" campaign encouraged farmers to grow millions of acres of hemp for ropes, thread, parachutes, and other products needed by the military.
- 1970 - The United States Congress passed the Controlled Substances Act by placing a comprehensive drug policy under federal control. This included laws related to the manufacturing, possession, sale, import, and distribution of certain substances including hemp and marijuana.
- 2012 - Colorado ballot initiative Amendment 64 established the legalized recreational use of marijuana and marijuana-infused products in the state of Colorado. The ballot initiative also required the state legislature to permit the cultivation, processing, and sale of industrial hemp. However, federal law still defined marijuana and hemp as illegal drugs.
- 2014 - The 2014 Farm Bill allowed institutions of higher education and state departments of agriculture to grow hemp under a pilot program.
- 2018 - President Trump signed the Farm Bill which legalized hemp using the definition above. The Farm Bill requires each state to submit a management plan to the USDA outlining how various aspects of hemp cultivation and processing will be managed within their jurisdiction. This process is ongoing in Colorado. See more: <https://www.colorado.gov/pacific/agplants/champ-initiative>.

FUTURE

Cultivating industrial hemp in Colorado requires registration through the Colorado Department of Agriculture (CDA). The 2018 Farm Bill mandates that states must maintain information on lands where hemp is grown. The CDA has no jurisdiction over industrial hemp processing, sales, or products. Boulder County Agricultural Resources is monitoring hemp production on open space. We are keeping a close eye on the economic factors and the agronomic considerations. What will the future hold? Stay tuned. We will find out together.

COLORADO STATEWIDE INDUSTRIAL HEMP REGISTRATIONS

	Registered Acres	Registered Sq. Ft.	Registrants	Registrations
2014	1,811	253,000	131	259
2015	3,657	570,980	166	333
2016	8,988	1.36M	312	424
2017	12,024	2.3M	386	532
2018	30,950	4.7M	835	1,075

Source: Colorado Department of Agriculture

As of July 15, 2019, there were 73 active industrial hemp registrations in Boulder County. There are at least six county-owned open space parcels where hemp is or will be planted for the 2019 cropping season.

Long's Expedition

by Lisa Brandt

In the corner of Boulder County, Long's Peak looms in silent, snow-capped majesty near its namesake, the city of Longmont. Originally named Les Deux Oreilles ("Two Ears"), Long's Peak was Major Stephen H. Long's first glimpse of the Rocky Mountains as he led a scientific exploration in 1820.

Who was Major Stephen H. Long, and why does Long's Peak bear his name? Let's step back in time, to discover the history behind this remarkable man and his journey to the West.

Long's life began on December 30, 1784, in Hopkinton, New Hampshire. He grew up in a family of 12 siblings headed by a military father. He enjoyed science and received a master's degree in engineering from Dartmouth College. Post-college, he taught mathematics at West Point. In 1816, Long was appointed as a Major in the Corps of Topographical Engineers and assigned to a post in St. Louis.

Three years later, in 1819, Major Long decided to join the Yellowstone Expedition, a military expedition led by General Henry W. Atkinson. A steamboat, *The Western Engineer*, was created specifically for the Yellowstone Expedition's journey up the Missouri River to the Yellowstone River. Long began his journey with a large group of soldiers and scientists in the fall of 1819 and made it as far as Nebraska before winter set in. He decided to set up winter basecamp 25 miles north of Omaha's current location.

A CHANGE IN DIRECTION: FROM THE MISSOURI TO THE PLATTE RIVER

While Major Long was camped near Omaha, he received orders that the military portion of the Yellowstone Expedition was on hold due to a treaty signed by Spain and Secretary of State John Quincy Adams. The treaty created a new border in the West towards the Pacific Ocean. This spurred President James Monroe's decision to change Major Long's orders to exploring and mapping uncharted territory in the West. To explore the uncharted territory, Major Long changed course from the



Long's Peak provides a backdrop to the Agricultural Heritage Center in Longmont.

Missouri River to the Platte River. He disbanded his few remaining soldiers and continued the expedition with Captain Bell and scientists. On June 6, 1820, Long and his crew started to navigate up the south fork of the Platte River towards the Colorado Rocky Mountains.

HONORING MAJOR LONG

Less than a month later, Long and his crew caught their first glimpse of the Front Range, in the form of Les Deux Oreilles. To honor both Major Long and their discovery, the crew decided to rename the mountain Long's Peak. From Long's Peak, the expedition traveled south to modern day Denver and Colorado Springs. Long's expedition then headed down the Arkansas River, and took a much-needed travel break near La Junta.

From there, Major Long and his crew split into two groups for the exploration of the Red River's headwaters—the final leg of the expedition. Major Long's group journeyed into Oklahoma, while the other group led by Captain Bell continued to travel along the Arkansas River. Nearly two months later, both crews were reunited in Arkansas at Fort Smith. Shortly thereafter, Major Long and his men parted ways and returned to their respective homes on the east coast.

RESEARCH ON OPEN SPACE

The Boulder County Parks & Open Space Department offers grants for research on county open space lands each year. All proposals are reviewed by a team of resource specialists, and awarded research projects are monitored during their activities on open space. The following is a summary of a 2018 study conducted by Kelly Triece, Joseph Ehrenberger, and Norma Davenport of Adaptation Environmental Services. Their project focused on bullfrog management on the Front Range.

Introduction:

Invasive species pose a significant threat to the world's biological diversity (Chapin et al. 2000). American Bullfrogs are one of the most ecologically destructive of invasive alien vertebrate species in the region (Kraus, 2009 & CABI, 2011). Bullfrogs have been documented to eat small fish, young ducklings, sparrows, snakes, wood ducks, and amphibians (Stewart 1967, Hewitt 1950, McAtee 1921, Wright 1920).

In particular they have been documented to predate a Colorado species of greatest conservation need, the Northern Leopard Frog (*Lithobates pipiens*) (McAlpine and Dilworth 1989, Leonard et al. 1993) and the Federal endangered species, Preble's Meadow Jumping Mouse (Trainor et al. 2007). In some lowland areas of Colorado (Hammerson 1999) and elsewhere (Lannoo et al. 1994), Northern Leopard Frog population reductions or extirpations have been associated with the presence of the increasingly abundant American Bullfrog (Hammerson 1982, Johnson et al. 2011), with both larval and adult life stages negatively impacting Northern Leopard Frogs (Hammerson 1999). American bullfrogs have negative effects on native wildlife due to predation, competition and transmission of disease (Kates and Ferrer 2003, Schwalbe and Rosen 1988).

A plan to strategically eliminate isolated bullfrog populations and disrupt metapopulation dynamics is key for success (Orchard 2011, Akins and Jones 2013). Our first step is to identify the most effective techniques for removal and determine how to maximize cost effectiveness. We identified two techniques for the purposes of this project, funnel traps and bucket traps with glow sticks and bait. Funnel traps aim to capture larval bullfrogs, while bucket traps aim to capture 5 adults. A third technique, hand-capture, was used at the end of the season due to low results from funnel traps and bucket traps. This technique is aimed at capturing metamorphs and adults.

This project was part of an interagency grant to Adaptation Environmental Services (AES) with Boulder County Parks and Open Space (BCPOS), City of Boulder Open Space and Mountain Parks (OSMP), and Jefferson County Open Space (JCOS). One additional agency, the City of Longmont, was also part of the project. Our 2018 objectives were:

To investigate bullfrog management methods by: 1. Assessing the effectiveness of the funnel trap, bucket trap techniques and hand capture. 2. Determining how best to maximize cost-efficiency per removal technique.

To share our goals, efforts, and results with other professionals at one or more conferences.

Testing these techniques will create expectations for effectiveness and cost, and work in conjunction with existing agency efforts for management goals. This requires close collaboration and organization with neighboring land managers.

If you want to read the full report, or other funded research, visit the department's website at www.bouldercountyopenspace.org/research

Drones Benefit Boulder County

by Emily Goodman

Curious about the future of drones in Boulder County Parks & Open Space?

As of July 2, 2019, the Federal Aviation Administration approved Boulder County Parks & Open Space (BCPOS) to use drones for natural, agricultural, and cultural resource monitoring and management. The department has two drones that will aid in mapping, topography, survey work, data collection, crop health, and videography, among other projects in the field.

DRONES TAKE FLIGHT

Unmanned aerial systems, more commonly known as drones, have skyrocketed in popularity throughout recent years. Implementing new drone technology is effective and efficient, opening the door to new opportunities for open space staff to capture different types of data in innovative ways. Starting this fall, BCPOS will begin new drone projects—after some extensive training, of course!

Boulder County Parks & Open Space protects many ecologically sensitive areas and is responsible for protecting our resources on county properties. With the help of drones, we can accomplish our mission, safely and effectively, without disturbing native species or visitors in our parks.

Drones have helped the department in the past by providing videography for flood recovery projects. They were used to monitor pre and post construction projects, determining where maintenance was needed, as well as efficiently tracking changes over time. Drone images will start being collected to create digital elevation models for the sites, aiding in long-term monitoring of the affected areas.

USES ON OPEN SPACE

The department has approved several upcoming pilot projects. The forestry program will benefit from using aerial imagery to manage activities such as thinning and prescribed fires, as well as managing insects, diseases, and wildfires. Topographic maps for trailhead designs and construction will be completed at a much faster pace, and high resolution photos will document the success or failure of sites treated for invasive species.

Boulder County Parks & Open Space takes a methodical approach to the use of drones on county open space properties. At a Boulder County Board of Commissioners' meeting, county residents voiced concern that we were prohibiting all drone use, even when it relates to research, training, and emergencies such as

law enforcement incidents, search and rescue, wildfire, or flooding. This concern was resolved by having a permitting process for these types of drone activities.

The permit process offers multiple benefits for protecting Boulder County's ecosystem. The National Oceanic and Atmospheric Administration received a permit to fly drones with sensors over prescribed fires on our properties. The University of Colorado Boulder will use this information to see if it will be beneficial for the control and suppression of true wildland fires all over the United States. Colorado State University and Bayer Environmental are currently working on a permitted drone project looking at the effectiveness of weed spraying for cheatgrass.

In the future, Boulder County hopes to be able to use drones for research surrounding elk counts, mapping prairie dog colonies, wildlife surveys, animal tracking, archiving 3D images of historic structures, and for videos for outreach, promotion, and education!



Image of restoration on lower Boulder Creek captured by a drone.

IF YOU WANT TO USE A DRONE

Drone permits may be granted approval only for research that benefits our parks and open space. Those wishing to operate a drone on Boulder County open space properties must first submit a permit request. Without permit approval there is a risk of receiving a \$300 fine. More information about the department's drone policy can be found at www.bouldercounty.org/open-space/management/drone-policy/.

If you are interested in using drones recreationally, the U.S. Forest Service permits drone usage, but you should check with the local ranger district before flying.

NATURE DETECTIVES



Fall 2019



Dung and Burying Beetles Reuse and Recycle

Bees and other pollinators get a lot of praise. That's good because they play a vital role in the lifecycle of plants. But don't overlook the beetles that reuse and recycle poop and dead animals. Without **dung beetles** and **burying beetles** our world would not be so sweet. Picture in your mind what your street would look like if nobody ever picked up the garbage. Yuck! Did you ever wonder what happens to all the "garbage" in nature? These cool beetles take care of part of it.

The Poop R&R Squad

Dung beetles deal with poop such as cow dung and deer droppings. Unfortunately, they say "No thanks!" to dog poop. They prefer the dung of mammals that eat plants.

Some kinds of dung beetles roll poop into balls that weigh more than the beetles. Like miniature acrobats, they propel their sphere over the ground. The male beetle pushes while the female sits on top of the ball and turns it with her legs. Their goal is to roll it into a tunnel they've dug for a nest site to raise their young.

The Dead Body R&R Squad

Burying beetles are a type of *carrion* beetle. They specialize in actually burying their carrion (dead animal) discoveries. They typically deal with the bodies of mice and small birds.

They begin by digging a pit underneath the carcass. Strange as it may seem, they remove the fur or feathers from their find. As they work, they line the pit area with that fur or feathers. They also remove the skin then push the body into a round shape. The process of burying the body takes hours, and they still have work to do to make it ready to nurture the larva stage of their young.

For more incredible facts on dung beetles and burying beetles that live in Boulder County, read on.



Location, Location, Location for **Dung Beetles**

Worldwide there are about 6,000 different species of dung beetles. Colorado dung beetles were likely more numerous when huge herds of bison were roaming the land. Many of those beetles died off when there were no more bison.

Besides the dung beetles that roll poop, there are beetles that carry bits of poop into a nest tunnel, and others that simply set up housekeeping in the poop where it sits. All three kinds work to make safe nests for their young. Underground nests are more easily guarded from rival dung beetles as well as flies and other poop scavengers. When the dung is carried underground, it also stays moist longer. Beneath the ground, the beetle eggs and young are better protected from predators that have a taste for insect eggs and hatched grub-like larvae.

Finding and Guarding Dung



The beetles have sturdy wings to fly around searching for perfect dung. They use their sensitive antennae to sniff the air for the wafting odor of poop. They use their legs to dig a tunnel for their find or to dig under it and into it. Spurs on their back legs help the rollers move their dung balls. Other dung beetles may try to claim the same tasty poop so they work quickly to get it to their nest.

Dung beetles will fight rival dung beetles to protect their food. Strong legs and horn-like shapes at the top of their head allow them to push and try to flip competitors. The strongest beetle usually wins and the rival beetle retreats.

Beetles Old and Young Savor Nutritious Dung

Digestion doesn't remove all the nutrients from swallowed foods so dung still has a lot of nutrition remaining. The moisture in fresh dung provides a nourishing soup sipped by adult beetles. The female lays her eggs on the dung, and both parents may stick around to guard the eggs and food supply. When the eggs hatch, the newly emerged larvae have ready-to-eat meals of poop.

Benefits of Dung Beetles and Survival Threats

Leftover underground bits of dung nurture plant roots. And, roots grow well in soils loosened by the beetles' burrowing. Less dung on the surface helps grazing animals by reducing the numbers of flies and disease-causing parasites such as worms.

When humans use pesticides to kill flies and treat hooved animals for parasites, dung beetles die too. Without dung beetles on the job, poop piles up, attracts more biting flies, and can smother plants. Scientists are studying how to help more dung beetles survive.



Carry On Carrion Beetles

The greatest variety of carrion beetle species (9 species) is found in the foothills of Boulder County (about 5,500'-8,000' elevation). That's not surprising because more kinds of animals live in the foothills than in the mountains or on the plains grasslands. Dead animals, called carrion, provide nest sites for these beetles. Some simply lay their eggs in carrion, and when the eggs hatch, the carcass is the food source for the larvae. **Burying beetles** are carrion beetles that raise their young from egg to pupa stage as a joint effort by both parents.

Strange but True, the Life of a Burying Beetle



Burying beetles search by smell for recently dead small birds or rodents such as mice. As the beetles fly along, they use their antennae to detect the aroma of carrion from quite a distance. If several burying beetles arrive, the males fight males and the females fight each other until the weaker beetles leave the carcass to the strongest pair. The winning pair work together to bury the carcass. Burying helps protect their find from other scavengers and predators.

Burying begins with digging beneath the body. After the beetles remove all the fur or feathers and skin from the carcass, they cover the body with their saliva and fluid from their anus, which slows down decay or rotting. They push the flesh into a ball and make a pit in it. The pit will soon house their young.



The female lays her eggs in the nest hole dirt. After the larvae hatch, a parent makes a noise to call them to the pit.

When the larvae have crawled onto the carrion ball, the parents feed them much like baby birds are fed. The parents take bites of the flesh, chew it, then regurgitate it for their young. Such parental care is rare in the insect world, except among social insects like bees or ants. Once the beetle larvae are bigger, they can take bites themselves.

Guarding Against Intruders

Tending the young is mostly the job of the female while the male spends his time guarding against other insects that would like an easy meal. After several days, each mature larva digs into the dirt and forms a pupa. Once the larvae start to pupate, the parents' jobs are done, and they leave to fly to new carrion.

After the pupae develop into adults, they dig to the surface and fly in search of their own carrion. Adults may feed on bigger carrion when not raising young.



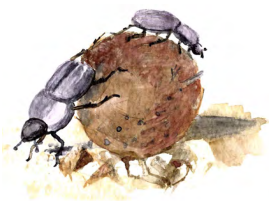
Carrion Beetles and Mites Help Each Other

Some **mite species** hitch a ride on carrion beetles. The mites eat eggs that various flies lay on or near dead animals. Mites ride along when beetles fly to fresh carrion, getting transported to food the mites couldn't find by themselves.

In turn, the beetles have fewer competitors eating their food. By eating fly eggs, mites reduce the number of fly larvae that would have hatched. The fly larvae, called maggots, compete with carrion beetles by also eating decaying animals.

Follow that Beetle!

Many dung beetles are active in the daytime, and use the position of the sun to guide their travel. Other beetles work the night shift and use the moon for navigation. Studies have shown some beetles use the stars to find their way.



When a dung beetle rolls a ball of poop away, it has to go in a straight line as fast as possible. The beetles are often moving upside down and backwards to accomplish this!

That's why being able to use the light of the sun, moon, and stars helps.

Try the tricks below to see if you can navigate like a beetle.

Watch the Sky

Notice the path the sun takes during the day (don't look directly at the sun—it will damage your eyes!). At night, notice the path the moon takes. Are the paths similar? Do you think these paths change during the year?

Practice Your Rolling Skills

If you have a large ball, go outside in your yard and try rolling the ball with your feet while walking on your hands. If you can do that, then try it again, and keep the ball going in a straight line this time. Can you do the beetle roll?



Observe



See if you can spot a dung beetle rolling a poop ball on open space property where grazers such as deer or elk share the habitat. One kind of dung roller, called a **tumblebug**, has been found on a trail near Rabbit Mountain. Tumblebugs are named for their clumsy rolling skills.

If you don't find a dung beetle, follow any beetle you do find. Watch it without disturbing it, and see where it goes and what it does. You might make a sketch of it in a notebook, and write down your observations.

See how many different beetles you can study.



American carrion beetle



Sherlock Fox says: Humans need to protect amazing dung and carrion beetles for the health of our ecosystems. Many beetle species have disappeared from our land, and the American carrion beetle is on the U.S. Endangered Species list.



Text by Katherine Young and Deborah Price
Illustrations by Carol Tuttle

Survivor of the Cold Slopes

by Anne Anderson

Lodgepole pine survives in the austere elevations between 8,000 to 10,000 feet in Colorado, although it is found extensively over the western states.

In Colorado, this pine, (*Pinus contorta subsp. latifolia*), covers about 1.5 million acres affording shelter for deer, elk, and bear as well as birds and smaller mammals. Thus, it is an essential part of the subalpine and montane ecosystems. The tree has very adaptable growth habits. Dense stands have upright trunks with narrow sparse crowns and shedding of the lower branches, although conical fuller crowns develop when trees are widely spaced. The straight trunks made these trees a choice for the supports of tipis and lodges, leading to its common name, the lodgepole pine. Why is the Latin name *contorta*? At higher windy elevations or coastal windy elevations, the trees will grow twisted. Native Americans also utilized lodgepole pine as a source of medicines and as a food from the growing cells under the bark.

As characteristic of a pine, the tree grows medium-length (one to three inches) flexible needles, generally in pairs, that last about three years before dropping. Both male and female cones are borne on the same trees which can be as young as 10 to 15 years. Female cones have sharp spines on the scales near the tip, and they are adapted to the fire-associated lifecycle of the lodgepole. They can be retained for up to 20 years with seed viability, enhancing the possibility that they would survive fires on older trees which develop a protectively thicker bark. For some trees, cones open on drying to allow seed drop. However, many lodgepole have serotinous cones, with scales sealed by resin retaining the winged seeds. With the heat of a fire, this resin softens, scales open and seeds fall to the fire-cleared ground to grow with little shade interference forming extensive uniform stands. “Dog hair” forest stands are typically established after a

fire which naturally recycles a stand at 100 to 200 year intervals. Maximum tree age is about 400 years with tree vitality decreasing between 120 and 140 years. Seeds overwinter and germinate with spring snowmelt and rain, and rapid seedling growth continues to limit competition from other ground covers.

Lodgepole pines establish on poor soils, such as granite and shales, and steep mountain slopes. Root formation adapts to access nutrition, in part boosted though colonization by ectomycorrhizal fungi. Fungal hair-like extensions extend into the earth funneling nitrogen, phosphorous and water to nurture tree growth, in return for carbon photosynthate from the pine needles. The underground ectomycorrhizal net interconnects roots of different trees acting as a communication conduit to spread resources. Mushroom outcroppings from the fungus are observed popping through the duff around the tree bases for their spread.

Currently, climate variability is stressing Colorado’s lodgepole forests. Drought and high temperatures weakened defense against the mountain pine beetle resulting in extensive tree kill, creating unsightly vistas of dead trees which are possible fuel for “hot” forest fires. While some might consider the blue-stained wood left behind by the pine beetle unsightly, many people prize it for its unique appearance and use it in art and building.

Although this beetle is a normal part of the ecosystem, large epidemic populations have affected the west due to increased drought and stress, along with the lack of age diversity stemming from heavy timber harvesting in the late 1800’s. Over 50 percent of Colorado’s lodgepole pines are also stressed by invasion with dwarf mistletoes, which steals the photosynthate for its own growth as a mass of bumpy stalks. The stress promotes challenge by insect pests and, with extensive growth, causes tree death.

Management strategies are being researched to sustain the lodgepole pine for its beauty on the mountainside, its keystone role in mountain ecosystems, and for its commercial value as a source of solvents and timber products.



Left photo: a stand of lodgepole pine. Right: The blue stain left behind by the pine beetle does not affect the quality of the wood in any way. Some like to use it because the unusual blue pattern offers visual interest.

DISCOVER BOULDER COUNTY

Calendar of Events

RATTLESNAKE HIKE

Saturday September 14, 9-11 a.m.

Near Lyons. Space is limited. Location provided when registering.

Enjoy a moderate 2-mile hike to learn about this fascinating reptile found in the plains and foothills. Volunteer naturalists will share information about the prairie rattlesnake, including habitat, ecology, behavior, and how to be safe in rattlesnake country. Register at www.bouldercountyopenspace.org/register.

STORY IN THE ROCKS—THE GEOLOGIC HISTORY OF BOULDER COUNTY

Thursday September 19, 7-8:30 p.m.

Louisville Public Library, 951 Spruce Street

The geologic history of Boulder County's remarkable landscape goes back nearly two billion years! Rocks contain a record of earth's history that can be read like the pages in a book. Join volunteer naturalists for this slide program and learn how to read the story in the rocks in our backyard.

BEARS IN OUR BACKYARD HIKE

Saturday September 21, 10 a.m.-noon

Near Boulder. Location provided when registering.

As fall approaches, black bears are busy gorging on berries and other food in preparation for their long winter sleep. Join volunteer naturalists on a moderate 1-mile hike to learn about the natural history of our local bruin and how people and bears can share our wild places. Register at www.bouldercountyopenspace.org/register.



Great
for
kids!

FUN ON THE FARM: ALL ABOUT WORMS, THE HERD UNDERGROUND

Friday September 13, 9:30-10:15 a.m.

Friday September 27, 10:30-11:15 a.m.

Agricultural Heritage Center

8348 Highway 66, Longmont

Bring your kids ages 3-6 to the farm to learn about animals, plants, and agricultural life. Programs include a short story time, hands-on activities, and a take-home craft. Afterwards, explore the farm. Children must be accompanied by an adult.

fun for
all
ages!

Crafts and Trades of Olden Days

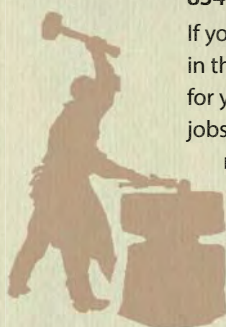
Sunday September 15, 10 a.m.-3 p.m.

Agricultural Heritage Center

8348 Ute Highway 66, Longmont

If you were a pioneer settler and there were no stores in the area, how would you get the things you needed for your family? Come learn about old-fashioned jobs and the traditional arts and crafts that went into making what was needed for life on the farm.

See demonstrations on blacksmithing, candle dipping, wool spinning and knitting, soap making, and beekeeping. There will also be make-and-take crafts for kids.



NATURE DETECTIVES IN THE FIELD: BEETLES RECYCLE!

Tuesday September 24, 10-11:30 a.m.

Near Boulder. Location provided when registering.

People aren't the only species that recycle—some beetles perform all sorts of favors for nature by recycling or reusing things like poop and dead animals. Discover the antics of these hard-working little insects and find out how being gross can lead to something great. For ages five-10 with accompanying adult. Register at www.bouldercountyopenspace.org/register.

iNATURALIST FOR YOUTH

Tuesday September 24, 4-5 p.m.

Superior Community Park, 1350 Coalton Road, Superior, meet at Turf Field.

Youth ages 10-18 and an accompanying adult will take a short hike at Superior Community Park to increase observational skills and learn how to use the iNaturalist app to capture what you see. Discover how to be part of the Boulder County Wildlife project on iNaturalist and help record wildlife sightings. Register at www.bouldercountyopenspace.org/register.

Calendar of Events

GEOLOGY WALK AT SANDSTONE RANCH

Saturday September 28, 10:30 a.m.-noon

Sandstone Ranch Open Space Visitor Center. Located south of Highway 119, one mile east of Weld County Road 1. Take the east entrance to the Sandstone Ranch area, turning south on Sandstone Drive. Follow signs to upper Visitor Center.

Join volunteer naturalist Roger Myers to explore and learn about the geology of Sandstone Ranch and Boulder County. From a scenic overlook, we will observe and learn about this dramatic and diverse landscape, from the Great Plains to the Continental Divide. After a short and easy walk exploring geologic history, you can visit the beautiful and historic Sandstone Ranch house to learn about some of the human history associated with this site.

fun for
all
ages!

Heritage Day & Vintage Baseball Game

Sunday September 29, 10 a.m.-3 p.m.

Baseball game begins at noon.

Walker Ranch Homestead, 7701 Flagstaff Mountain Road, approximately seven miles west of Boulder

See how autumn was spent on a working ranch in the late 1800s and watch the annual vintage "base ball" game. Costumed volunteers will demonstrate chores such as root-cellaring, sausage making, and doing laundry with a washboard and wringer. Watch the blacksmith make hinges, nails, and other hardware needed around the ranch, attend a one-room school session or take a guided homestead tour.



For more information, contact Sheryl Kippen at skippen@bouldercounty.org or 303-776-8848.

Please note: Dogs and bicycles are not permitted at the homestead.

OH DEER, ELK, AND MOOSE!

Saturday October 5, 10 a.m.-noon

Near Nederland. Location provided when registering.

Join volunteer naturalists for a moderate two-mile hike to learn about the natural history, behavior, and ecology of the three members of the deer family that call Boulder County home—mule deer, American elk, and moose. We'll also look for signs of wildlife along the trail. Register at www.bouldercountyopenspace.org/register.

STORY IN THE ROCKS HIKE

Saturday October 12, 10 a.m.-noon

Near Lyons. Location provided when registering.

Join volunteer naturalists for a 1.3-mile moderate hike to learn how this scenic landscape has changed over time. The stories in the rocks span over 200 million years, from ancient sand dunes to tidal flats to riverbeds where dinosaurs roamed. The rocks also determine the landforms and ecology of the present landscape, including the plants and wildlife we find here. Register at www.bouldercountyopenspace.org/register.

Junior & Senior Fishing Derby

Saturday October 12, 9 a.m.-noon

Wally Toevs Pond at Walden Ponds Wildlife Habitat off of 75th Street between Jay Road and Valmont Road, Boulder

Participants need one senior 65 or older and one junior 15 or younger, to fish together as a team. Prizes are awarded for the team that catches the heaviest trout, has the largest age difference, and are first to catch the limit.

- The pond is stocked with rainbow trout—artificial and live bait are permitted.
- Seniors must have a valid Colorado fishing license.
- A wheelchair accessible pier is available.

For more information contact Michelle Marotti at 303-678-6219 or mmarotti@bouldercounty.org.



All Programs:

All ages welcome unless otherwise noted. NO PETS PLEASE! Be prepared for cool to warm temperatures. Bring drinking water and dress in layers. For more information or to arrange a volunteer-led program for your group, please call 303-678-6214.

Astronomy Programs

IT'S RAINING METEORS

Saturday September 7, 7-9:30 p.m.

Near Lyons. Location provided when registering.

Discover fun facts about these streaking lights across the sky at a brief family-friendly program at the shelter. Afterwards enjoy viewing the night sky with telescopes provided by the Longmont Astronomical Society. Register at www.bouldercountyopenspace.org/register.

WALK IN THE LUNAR LIGHT

Friday September 13, 7-9 p.m.

Near Boulder. Location provided when registering.

Enjoy an easy one-mile walk on open space under the light of the moon. Meet at the picnic shelter. Register at www.bouldercountyopenspace.org/register.

DROP-IN ASTRONOMY: SEE THE STARS

Saturday October 5, 7-9 p.m.

Near Lyons. Location provided when registering.

Join county volunteers and the Longmont Astronomical Society to view the sky in the dark surroundings of open space!

Register at www.bouldercountyopenspace.org/register.

GOATS GALORE—MEET AND GREET

Sunday October 13, 10:30 a.m.–12:30 p.m.

Agricultural Heritage Center, 8348 Ute Highway, Longmont

Join the Goats Galore 4-H club and their goats for a drop-in program all about goats. Why do people raise goats? Do goats really eat tin cans and tennis shoes? How do I get involved in 4-H with goats? Get answers and learn about raising goats, different breeds, and their housing and feeding requirements.

BIRDING BOULDER COUNTY THROUGH THE SEASONS

Wednesday October 16, 7-8:30 p.m.

Longmont Public Library, 409 Fourth Ave., Longmont

Join volunteer naturalists to learn about birding through the seasons in Boulder County. This program will explore where to find and how to identify some of our local and migratory birds, and also introduce you to an amazing range of ecosystems and habitats.

HIGH PEAKS AND SILVER DREAMS

Saturday October 19, 9 a.m.-noon

Near Nederland. Location provided when registering.

Join volunteer naturalists for a fascinating hike through geologic and historical time, as we explore ancient mountain-building, alpine glaciation, and the history of hard rock mining in the high country. We will also identify diverse plant and animal communities and look for signs of wildlife on this moderate four-mile (round-trip) hike. Register at www.bouldercountyopenspace.org/register.

DIGGING THE SUGAR BEET

Saturday October 26, 1–2:30 pm

Agricultural Heritage Center, 8348 Ute Highway, Longmont

Come learn about Boulder County's sweetest crop. Participants will have the opportunity to pick, process, and taste their own sugar beet. While the beets simmer, we'll do a short presentation on the history of the sugar beet in Boulder County. For ages eight and older with an accompanying adult. Space is limited. Register at www.bouldercountyopenspace.org/register



Autumn Mining Programs

HARD ROCK MINING TOURS

Saturday September 7, 9:30 a.m. –12:30 p.m.

Saturday October 19, 9:30 a.m. –12:30 p.m.

Nederland Mining Museum 200 N. Bridge Street, Nederland

Tap into the towns, tools, and characters of local hard rock mining heritage by visiting mining sites of years gone by. Tours are free and open to ages 10 and older. Some walking required. Register at www.BoulderCountyOpenSpace.org/register or call 303-258-7332.

GOLD PANNING

Sunday September 22, noon-2 p.m.

Sunday October 27, noon-2 p.m.

Nederland Mining Museum 200 N. Bridge Street, Nederland

Try your hand at gold panning! This activity led to the settlement of Boulder County as people sought their fortunes. Programs are open to ages five and older. Registration required. Register at www.BoulderCountyOpenSpace.org/register or call 303-258-7332.

AN EVENING AT THE MUSEUM

Nederland Mining Museum, 200 N. Bridge Street, Nederland

Visit the Nederland Mining Museum after hours for a special guest speaker, along with coffee and dessert.

Friday September 13, 7-8:30 p.m. Overview of Metal Extraction—Mining, Milling, Reduction, and Refining by Donald Johnson and Charles Melbye

Friday October 11, 7-8:30 p.m. Family Evening at the Museum—CariBOO: Mythical Creatures and Stories. Children must be joined with accompanying adult. Registration required at www.BoulderCountyOpenSpace.org/register or call 303-258-7332

great
for kids!

WILDLIFE AND WINTER HIKE

Saturday November 2, 10 a.m.-noon

Near Nederland. Location provided when registering.

Join volunteer naturalists for an easy two-mile hike to learn about the many ways that animals prepare for and survive winter in the high country. We'll talk about different wintering strategies including migration, hibernation, and other adaptations. We will also look for signs of wildlife activity, including tracks, scat, and browse marks on trees and shrubs. Register at www.bouldercountyopenspace.org/register.

BIRDS OF PREY SLIDE PROGRAM

Wednesday November 6, 7-8:30 p.m.

Louisville Public Library, 951 Spruce Street, Louisville

Join volunteer naturalists and learn how to recognize birds of prey, including hawks, eagles, falcons, and owls in the skies above Boulder County. During this slide presentation, you'll observe and learn how to distinguish between different raptors by identifying field marks, behavior, location, and time of year. You will also learn about the habitat requirements and ecology of these magnificent birds.



BIRDS OF PREY DRIVING TOUR

Saturday November 16, 9 a.m.-noon

Space is limited. Location provided when registering.

Join volunteer naturalists for a driving tour of some of Boulder County's best areas to view birds of prey, or raptors. We will carpool from our meeting place searching for raptors, learning about habitat, and working on our observation and identification skills. Please bring binoculars and a bird field guide if you have them. For ages 10 and older with accompanying adult. Register at www.bouldercountyopenspace.org/register.



NATURE HIKES FOR SENIORS

Enjoy a guided nature hike for seniors every month. For more information, call 303-678-6214. Programs begin at 10 a.m. and end at noon. Meet at parking lot kiosk.

Thursday September 26, Mud Lake Open Space

Thursday October 31, Pella Crossing Open Space

**Volunteer
Opportunity**

Be a Volunteer Naturalist!

If you enjoy nature and sharing your knowledge with others, apply to be a volunteer naturalist.

Volunteer naturalists lead hikes, present slide programs, and provide hands-on experiences to people of all ages. We are especially looking for people interested in sharing nature with school groups, both on trails and in the classroom. Topics range from wildlife and plants to ecology and geology. You will learn about interpretive techniques to connect with audiences.

TRAINING INFORMATION: Training classes take place on Tuesdays, January 14-March 17, 8:30 a.m.-4 p.m. in Longmont.

PLEASE CONTACT: Larry Colbenson, Natural History Program Coordinator, at 303-678-6214 or lcolbenson@bouldercounty.org for information and application. **Application deadline is November 8, 2019 or until class is filled.** Since there is limited space, all applicants will be interviewed.

When to Visit Ron Stewart Preserve at Rabbit Mountain

The park will be closed Monday-Wednesday from Sept. 9 through Jan. 29. It is open to the public Thursday-Sunday from sunrise to sunset.

The property will be open with no restrictions:

- Nov. 25-27
- Dec. 23-25
- Jan. 20

Visit www.BoulderCountyOpenSpace.org/elkmanagement for more information.

Help Improve Park Experience for Visitors with Disabilities

Boulder County Parks & Open Space seeks input from people with disabilities, as well as their family, friends, and those who work with people with disabilities. Staff would like input both from those who have visited county open space properties and those who have not.

The survey is available at BoCo.org/OpenSpaceSurvey. No names or other identifying information will be gathered. The survey will remain open until an adequate number of surveys are received.

Parks & Open Space values and appreciates the opinion of people of Boulder County. The feedback and ideas collected will be used to improve the experience for visitors who have disabilities.

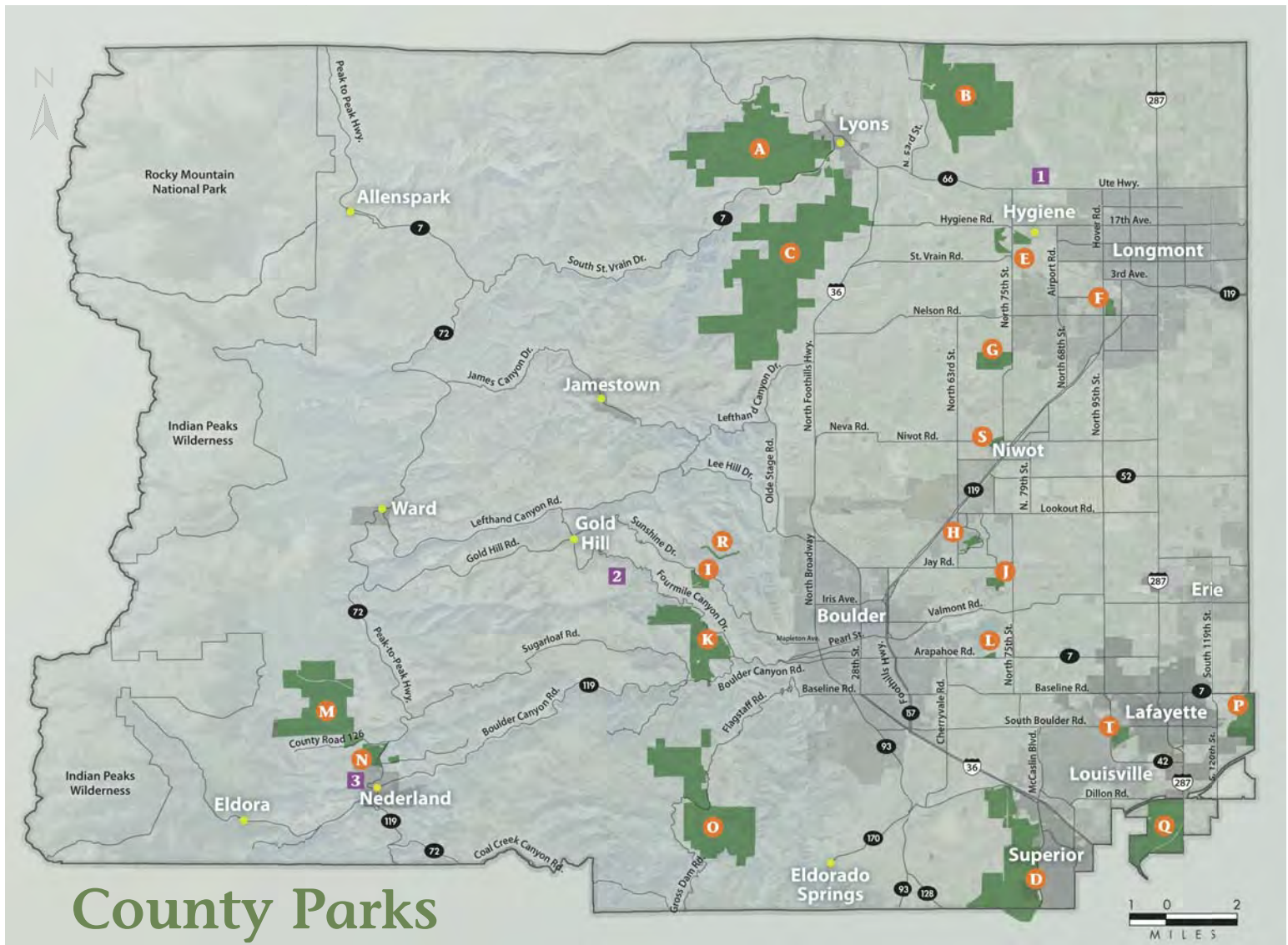
For more information, please contact Michelle Marotti at mmarotti@bouldercounty.org or 303-678-6219.



Parks & Open Space

5201 St. Vrain Road, Longmont, CO 80503

www.BoulderCountyOpenSpace.org



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|--|---|---|---|
| A Hall Ranch | F Boulder County Fairgrounds | L Legion Park | R Anne U. White (closed due to 2013 flood) |
| B Ron Stewart Preserve at Rabbit Mountain | G Lagerman Agricultural Preserve | M Caribou Ranch | S Dodd Lake |
| C Heil Valley Ranch | H Twin Lakes | N Mud Lake | T Harney Lastoka |
| D Coalton Trailhead | I Bald Mountain Scenic Area | O Walker Ranch | 1 Agricultural Heritage Center |
| E Pella Crossing | J Walden Ponds Wildlife Habitat | P Flagg Park | 2 James F. Bailey Assay Office Museum |
| | K Betasso Preserve | Q Carolyn Holmberg Preserve at Rock Creek Farm | 3 Nederland Mining Museum |