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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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Blue Jay Mine, Nathan McBride
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NATURE DETECTIVES

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DISCOVER BOULDER COUNTY

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Volume 40, number 1

The Soil Revolution Continues

Part 2 of 2

by Vanessa McCracken



Volunteers Mary Raynolds, Lynette Schwanger and Amy Voit monitor soil health on the Pasqual Property.

The Fall 2017 issue of *Images* highlighted the efforts of Boulder County Parks & Open Space (BCPOS) to monitor soil health on county-owned agricultural properties. The 2017 season engaged more farmers, ranchers, and volunteers, created more insights, and led to a greater understanding of the principles of soil health.

Five Principles of Soil Health

Soil Armor: Reduces wind and water erosion, decreases water evaporation, moderates soil temperature, reduces the impact of raindrops, suppresses weed growth, and provides habitat for soil organisms.

Minimize Soil Disturbance: Soil disturbance is divided into biological, chemical, and physical processes. Over time, minimizing soil disturbance will help rebuild soil aggregates, pore spaces, soil glue, and soil organic matter.

Plant Diversity: Crop rotations provide more biodiversity benefitting the soil food web. Crop rotations can be designed to include cool and warm season broadleaves and grasses, high and low water users, fibrous roots and tap roots, as well as legumes and non-legumes, to name a few.

Continual Living Plant Root: A living plant root, either from a commodity crop, cover crop, or forage crop provides exudates to feed the soil food web. Cover crops can fill in the dormant periods between annual cash crops.

Livestock Integration: Balances soil carbon and nitrogen ratios by converting high carbon forages to low carbon organic material, thus reducing nutrient export from the soil. Integrating livestock also promotes rangeland and pasture management in combination with cover crop grazing.

VOLUNTEERS COMPLETE ASSESSMENTS

Eighteen volunteers honed their soil health assessment skills on eight different agricultural properties in 2017. Properties ranged from no-till alfalfa fields, to conventionally farmed grain crops, to dryland wheat/fallow systems, to organic vegetables, to soil-building cover crops. On eight beautiful summer nights, BCPOS staff, Natural Resources Conservation Service (NRCS) staff, and volunteers completed the Colorado NRCS Soil Health Cropland Resource Concern Assessment card that assesses physical and biological conditions of the soil. BCPOS and NRCS staff also collected soil samples from eight properties in September for lab analysis at Cornell University for the Comprehensive Assessment of Soil Health (CASH) and at Ward Laboratories for the Haney Test. Combined results of the field score, CASH and Haney tests are found in the table below.

The analyses results are shared with the agricultural tenants who lease open space properties. These results help guide management decisions about how to best steward this vital resource, while maintaining economic and environmental sustainability.

CLIMATE CHANGE AND SOIL

Climate change and carbon sequestration are at the forefront of many minds. To investigate exactly how much carbon is in agricultural soils, BCPOS partnered with the NRCS to complete quantitative data collection of full soil characterization and dynamic soil properties on seven properties. Site selection emphasized locally important farmland managed with common farming practices. National protocol was used by the sampling team consisting of NRCS soil scientists and BCPOS staff. This data set is the first full characterization data produced by USDA-NRCS for the Soil Survey of Boulder County Area (CO643). Trenches dug two meters deep allowed the team to collect soil samples to evaluate key soil properties including total soil organic carbon, soil organic carbon changes by depth, cropping rotation, and by land use, particulate organic matter, CO₂ mineralization rate, aggregate stability, texture, bulk density, pH, cation exchange capacity and available water capacity. These data



Mike Moore, Soil Scientist with USDA-NRCS, analyzes a soil core sample.

will be available upon completion of the analysis by the Kellogg Soil Survey Laboratory in Lincoln, NE in 2018. Data will be published at the following website: ncsslabsdatamart.sc.egov.usda.gov

In addition to monitoring soil health on agricultural open space, BCPOS co-hosted (along with NRCS, Colorado State University Extension, the Longmont and Boulder Valley Conservation Districts, and the City of Boulder) two soil health conferences in 2017. “The Soil Revolution” and “The Soil Revolution: Digging Deeper” (www.SoilRev.org) brought together over 20 speakers including farmers from Boulder County, Eastern Colorado, the San Luis Valley, New Mexico, and Nebraska. Soil health experts from the NRCS, Colorado State University, and the private sector also inspired the audiences with their hopeful messages about improving soil health to increase farm resiliency, both environmentally and economically. Over 400 people attended the conferences.

The Agricultural Resources Division at BCPOS recognizes the time and talent of our partner agencies in Boulder County and the volunteers dedicated to our programs. We would not exist without our 65 tenant farmers and ranchers—our partners in conservation. Their dedication to Boulder County agriculture is unmatched. Thank you!

COMBINED 2017 SOIL HEALTH RESULTS

	Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7	Property 8	Property 9
Field Score	2.6	1.8	1.7	2.2	1.5	1.3	1.6	1.8	N/A
CASH Score	65	49	N/A	64	51	36	42	48	52
Haney Score	8.13	11.09	N/A	10.33	12.37	6.20	4.83	5.66	7.66

The **Field Score** ranges from one to three; three being highest or best. The **CASH Score** ranges from one to 100; higher scores are better. The **Haney Score** ranges from one to 50; seven or higher is preferred.

Protection from Fire: Zone Defense

by Nathan McBride

In 2015, Boulder County Parks & Open Space (BCPOS) was awarded two grants to create defensible space around 99 structures on 15 county open space properties. We received a \$306,212 hazard mitigation grant from the Federal Emergency Management Agency (FEMA) and a \$345,000 wildfire risk reduction grant from the State of Colorado. In addition, Boulder County spent \$29,212 on the project that was completed in late 2017.

The primary goal was to create an area between structures and oncoming wildfires where flammable materials have been managed to reduce threats, allowing firefighters to safely defend structures. The defensible space extended at least 100 feet around each building cluster, with a two-zone approach of varying mitigation methods. An important element for the project was the value of the historic buildings and cultural landscape.

The project included audits for each site to identify concerns for mitigation for project planning. Then, “property prescriptions” were created that reconciled the contractor’s audit with other management objectives such as cultural, environmental, and public use concerns.

Defensible space activities were based on the following objectives for these zones:

Zone 1A: Within five feet of each structure, create a perimeter that is easy to maintain and defend by removing flammable materials and reducing flammable connections between the structure and the landscape.

Zone 1B: Within 15 feet of each structure, remove all trees that are not historically significant as well as limit large flammables and manage vegetation to limit fuel sources and continuity.

Zone 1C: Approximately 30 feet from each structure, the focus was to create defensible tree spacing, eliminating ladder fuels, and managing understory vegetation. Future BCPOS forestry mitigation activities may occur beyond Zone C subsequent to this project to further mitigate risk.

Zone 2: Within 100 feet of edge of structure, thin to reduce crown density and connectivity, eliminate ladder fuels, and manage understory growth.

One of the open space properties included in the project was the Blue Jay Mine in the Jamestown area. Aggressive thinning was done in the forest below the structures, as well as some thinning in the forest above the structures. That work increased crown spacing, and decreased fire intensity in the case of a wildland fire. The thinning also compliments the 160-foot wide meadow where structures are located acting as a break to the heavier fuels and potential crown fire.

BLUE JAY MINE: PROGRESSION OF PROTECTION

The Blue Jay Mine is a late 1930s to early 1940s fluorspar mining operation southwest of the Town of Jamestown. The Blue Jay Mine began operations as early as 1903 and continued to operate as the demand for fluorspar fluctuated through the Great Depression, World War II, and peacetime manufacturing. The Blue Jay Mine is historically significant for its contributions in making Boulder County one of the nation’s principal producers of fluorspar, a mineral important in smelting steel, and as a rare example of a small fluorspar mine consisting of a hoist house, head frame, and ore bin.

In 2000, Boulder County purchased the property and surrounding 41 acres to preserve the property as open space and its historic surface features. As a testament to the Blue Jay Mine’s importance to county’s mining history, the property was landmarked in 2007. The property is open to the public with a hiking trail passing through the property to adjoining U. S. Forest Service lands.



Top photo: Blue Jay Mine before a defensible space was created to reduce threats to the property from fire.

Bottom photo: After zones surrounding the Blue Jay Mine were cleared.

Research on Open Space

The Boulder County Parks and 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 2017 inter-agency study conducted by the Department of Human Dimensions of Natural Resource at Colorado State University. The project focused on outdoor recreation barriers, amenity preferences, and communication and outreach needs of the Latino/Hispanic community in and around the Denver metro region.

Abstract: Demographic shifts in the U.S and the state of Colorado indicate a rapidly growing Latino/Hispanic population. Local open space agencies need to be cognizant of this change and work towards increasing Latino/Hispanic use in their parks to ensure long term support of their programs and land base. To better cater to the growing Latino/Hispanic population, open space agencies require an improved understanding of potential barriers that are limiting park and open space use; preferred amenity needs; and how to best communicate and reach out to this section of the community.

A two-stage, mixed-methods research project centered around the Denver metro region was undertaken that identifies and evaluates possible barriers to outdoor recreation, park amenity preferences, and the communication and outreach preferences and needs of the Latino/Hispanic community within the context of county open space. The initial geographic focus of the study was concentrated on the six-county region of Jefferson, Boulder, Adams, Arapahoe, Broomfield, and Denver counties. However, for purposes outlined in the report, the scope was opened to the broader Denver metro region. For stage one of this research project, a focus group including community leaders from the Latino/Hispanic community was proposed to help identify relevant barriers, amenity preferences, and communication and outreach needs of the Latino/Hispanic community. However, difficulties in accessing community members, with only two responses from the thirty-three people and organizations contacted, required a modification to the proposed project. Two in-depth qualitative interviews with the two respondents were conducted (one who identifies as Latino/Hispanic, another who does not), in place of the proposed focus group, to address the abovementioned aims of stage one of the research project.

This data, alongside a comprehensive literature review, helped inform stage two of the research project, which was a self-administered survey delivered via the Qualtrics Web-survey platform to Latino/Hispanic residents predominantly residing in and around the Denver metro region (n=485). On-site intercept surveys were also handed out to county open space visitors at four county open space areas (Bald Mountain Scenic Area, Corwina Park, Lagerman Agricultural Preserve, Lair o' the Bear Park) in Denver, Jefferson, and Boulder counties (n=25). Only two respondents from the on-site intercept surveys self-identified as being Latino/Hispanic. Therefore, in total, 487 surveys were completed by those who self-identified as being Latino/Hispanic. The aim of this survey was to evaluate the identified barriers, amenity preferences, and communication and outreach needs of the Latino/Hispanic community among the broader population predominantly within the Denver metro region.

Findings indicate that the large majority of Latino/Hispanic respondents do visit parks/open space on an occasional or frequent basis. Motivations vary, but the importance of spending time with friends and family are widely shared. So too are the use of picnic tables and other built facilities. A range of barriers to visiting parks/open space were explored. While many were identified as being potential barriers by respondents, few were rated as strong barriers by a high number of respondents and a relatively low proportion of respondents indicated an inability to overcome them. Communication needs at parks/open space include information on maps, trails, opening hours, and rules and regulations, with interest also expressed in educational signage. The preference for bilingual signage at parks/open space was also noted. The role, importance, and preference of friends and family, followed by the Internet, was also identified. Statistically significant differences were identified between family generational groups and generation cohorts within the sample.

Recommendations include efforts that the counties can undertake to increase overall interest in parks/open space among Latino/Hispanics, ensuring appropriate facilities and their maintenance are provided, ensuring clear signage and improved directional information to get to parks/open space, providing bilingual signage at parks/open space, improving information communicated on county websites, and efforts to communicate through social media platforms.

Visit www.BoulderCountyOpenSpace.org/research to read the full report or other funded research.

Protecting Dark Skies and the Creatures Below

by Deborah Price



A night sky captured at Heil Valley Ranch

Visitors to Colorado are often awestruck when they see the night sky. There are many places in the world where few or no stars are visible due to light pollution.

The artificially-lit sky that many are accustomed to around the world is now a more common occurrence in Colorado, including in Boulder County. Even the darker sites here are not the sky that many of our ancestors gazed upon, and certainly not the same sky that inspired Native Americans.

In Boulder County, it's impossible to find a sky that isn't encroached on by lights from a nearby city. It's not just the beautiful starry sky that disappears—it's also the darkness. According to the National Park Service, 62 percent of all animal species are nocturnal and depend on darkness for survival. Artificial lights affect plants as well. A study noted that prolonged exposure to artificial light prevents many trees from adjusting to seasonal variations. This then affects wildlife that depend on trees.

Birds are often negatively impacted by a lack of dark skies, especially during migration. The U.S. Fish and Wildlife Service estimates that five to 50 million birds die each year from collisions with communication towers as a result of confusion from artificial lights. A 1960s study showed that the indigo bunting uses the pattern of stars rotating around Polaris to determine the direction of its southerly migration.

THE MILKY WAY SHOWS THE WAY

Birds aren't the only animals affected by lack of darkness. Dung beetles are the only species known to use the Milky Way

for navigation, moths use the moon and stars for guidance, and fireflies communicate with their own light on dark nights. Artificial light breeds havoc for these species in a variety of ways.

People need darkness too. In addition to the simple enjoyment and cultural significance of the night sky, studies are being performed that examine the effects of artificial light on human health and the connection to cancer and other diseases.

PROTECT THE LANDS, PROTECT THE SKIES

Protected lands conserve areas for wildlife, recreation, open views, and agriculture, but they also help preserve dark skies. The National Park Service has been a leader in protecting darkness. In collaboration with their Night Sky office in Fort Collins, Boulder County Parks & Open Space joined forces with the National Park Service, City of Fort Collins, and Larimer County Natural Resources three years ago to collect data on dark skies

along the Front Range. Once a year, volunteers go to many of our open space sites and measure the darkness of the sky on a clear night using light meters designed specifically for this purpose.

It may not be difficult to guess that Caribou Ranch near Nederland is one of Boulder County's darkest open space properties. Light meter readings show that the skies there are approximately 75 percent brighter than a natural sky, while data collected at the Coalton Trailhead in Superior, where much more artificial light is present, show skies at 943 percent brighter. In comparison, the skies atop Trail Ridge Road in Rocky Mountain National Park are about 40 percent brighter than a truly dark sky. Even at over 12,000 feet, artificial light trespasses on the night sky.

HOW TO HELP THE SKIES

One of the main impacts to overly lit skies is the form of lighting used. Homeowners can help by making sure yard lights are shielded to direct light downward, that flood lights are only triggered with motion, and that amber or warm-colored LED lights are used rather than cool blue LEDs that amplify sky brightness. Boulder County is helping in this effort—public lighting installed must shine downward only, reducing the amount of light that shines upward into the sky.

As years go on, it will be interesting to see how this data changes. Will our skies continue to fade away, or reveal the points of light in the darkness of our wild Colorado skies?

NATURE DETECTIVES

Spring 2018



A Squadron of Pelicans Returns

"Look!" Scout yelled, pointing at the distant sky.

"Oh, wow." Alex breathed out softly. "The pelicans are back from the Gulf of Mexico." Alex and Scout watched as the huge white birds with black-edged wings soared toward them over Cottonwood Marsh.

The birds circled silently then landed on the far side of the marsh. The pelicans touched feet first onto the water, using their legs like water skis. Their big, webbed feet pushed forward against the water, slowing the birds as they settled on top of the pond.

Scout laughed. "Remember when grandpa didn't believe there were pelicans in Boulder County?"

"I'd guess a lot of people don't know that American white pelicans summer here. They have to see them with their own eyes. Like Grandpa did," Alex added.

"They remind me of pterosaurs, you know, those ancient flying reptiles. I wish the pelicans would nest on one of the little islands at Walden Ponds."

"They need more room for a whole bunch of them to nest together. And, they don't like to nest near people. Good thing they don't mind flying even 60 miles to fish for stuff to feed their babies."

Foraging for Food

The two kids stared as the birds paddled silently across the marsh, peering into the water for prey. They dipped their bills under water over and over. The expandable pouch on the lower half of a pelican's large bill works like a fish net. Alex and Scout watched the birds raise their heads to drain water from their pouch before they swallowed the trapped fish or maybe a salamander, a crayfish or some tadpoles.



Flying Squadrons and Synchronized Swimmers



American white pelicans are the biggest birds in Colorado. It is awesome to see a group of them fly in formation and land together with military precision. At times they also cooperate while feeding with precisely coordinated movements.

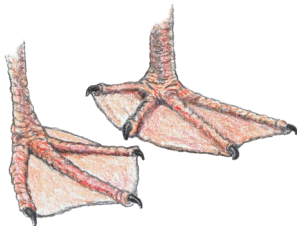
By swimming forward together in a line or forming a semi-circle, they herd little fish into tight groups or into shallower water for easier trapping. Sometimes the birds flap their wings on the water as they swim to help drive schools of fish close together for an easy catch.

The pelicans repeatedly plunge their bills into the water and scoop up many more fish than they could catch working solo. They never dive from the air to catch fish. In shallow water they may tip up like dabbling ducks to capture prey.

Forming the Nesting Colony

Boulder County pelicans choose a partner soon after arriving from their southern, coastal wintering grounds. They impress each other by flying in circles, strutting, bowing and head bobbing. They will nest on islands in the middle of large reservoirs out on the plains, many miles from some of their foraging waters.

The nesting birds settle close together in large colonies. The pairs posture and grunt to threaten their neighbors and claim a nest site. They have a flat horn on top of their upper bill. The bony growth is like a tiny plate balanced on edge. Pelicans jab at their neighbors and joust with their bills to defend their space in the crowded colony. After nesting season, they lose their bill-top plate.



White pelicans make simple nests by scraping dirt and any bits of vegetation into a circular rim. The female lays two eggs, a couple days apart. The parent birds take turns keeping the eggs protected and at the right temperature by placing them under their big webbed feet.

Weird Noisy Eggs!

Unhatched pelicans, nearly ready to break out of their shell, will squawk loudly if they feel too cold or too hot. They are noisy complainers after hatching too. The parents switch to protecting the hatchlings by resting their feathered body over the babies instead of placing their big feet on top of them.

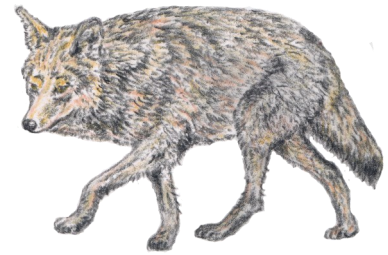
Hungry, Hungry Chick

Parents take turns fishing day and night to feed their young. They regurgitate fish onto their own feet or onto the ground for a new hatchling. As the chick grows, it grabs food right from mom or dad's pouch. When it gets bigger yet, the chick forces its own bill down into the parent's throat in its rush to get food.



Dangers for Eggs and Hatchlings

White pelicans are easily spooked off their nests by people or predators. A loud motorboat or a low-flying airplane will cause them to fly from the island. Gulls nesting nearby will quickly seize any opportunity to eat an unprotected egg or snatch a hatchling. Ravens will also devour untended eggs.



If water surrounding the island sanctuary gets too shallow, coyotes or red foxes may raid the nests. Their approach causes the parent birds to soar away.

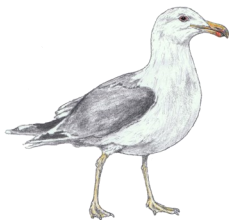
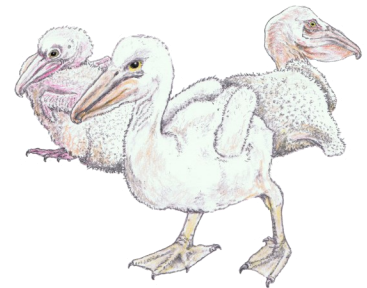
It is tough to be a baby pelican. In any unprotected nest, eggs or baby birds can quickly overheat in the sun or get chilled on a cool day. Eggs that accidentally roll out of the nest or are pushed out of the nest by the first hatchling are abandoned.

The chick from the first egg laid in the nest has the best chance for survival. It is bigger than its younger sibling. It bullies the younger bird away from the food and sometimes all the way out of the nest. It is difficult for adult birds to provide enough food for two offspring. It takes about 150 pounds of fish to raise just *one* baby pelican. That's a lot of fishing!

No wonder pelicans are clever at stealing large fish from another pelican. They will even steal fish from hatchlings in other nests.

Baby Pelicans Huddle Together

Three-week-old hatchlings can walk. Walking allows them to cluster in groups with neighboring youngsters.



The parents now forage together night and day to feed their rapidly growing offspring. With their parents mostly off fishing, more and more babies huddle together for warmth and for some protection from predators. Great horned owls and bald eagles will snatch a lone hatchling. Gulls sometimes harass them until the nervous baby pukes up a fish meal for the gull.

Up, Up and Away

Young pelicans learn to fly when they are about nine weeks old. They are capable of swimming even before they can fly. By ten weeks they leave the nesting site to forage and fly with the flock. Juveniles migrate south with the adults. Most juveniles won't return north until they are two years old, and they won't become parents until their third spring.

Surviving the first couple years is difficult, but predators don't bother adult pelicans much. If they can avoid diseases and accidents, a pelican can live over 20 years.

What About Brown Pelicans?

Have you seen brown pelicans at the sea shore? Brown pelicans are smaller than American white pelicans, and brown pelicans live near the ocean all year. They fish by diving into the water after their prey. They don't migrate to Colorado.



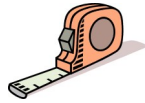
Unique Features of American White Pelicans

American white pelicans have bodies equipped for spending most of their time in the air or on the water. These pelicans are about four feet tall. Weighing in at around twenty pounds, they are one of the heaviest flying birds in the world.

Their wings measure nine feet across their body, from wing tip to wing tip. With a slow and steady wing flap, they are capable of flying long distances.

They are equally at home on water. Little air sacs under their skin allow them to float effortlessly. They paddle easily with very large webbed feet as they swim around marshes or lakes searching for fish.

How Do You Measure Up?



How tall are you? Get a tape measure or yardstick and have someone help you measure how tall you are. Then, spread your arms wide and have someone measure the distance fingertip to fingertip across your body. How do your measurements compare to a pelican?

Next time you're in a swimming pool, use a small floatee or noodle under your arms and wear some flippers. When you kick your way across the pool, you'll see how easy it is for pelicans to move on the water.

Now That's a Big Gulp!

American white pelicans can hold as much as three gallons of water in their expandable skin pouch. After they scoop up a fish, they slowly let the water out of their pouch, but they keep their catch trapped. With a quick jerk, they send a fish down their throat – lunch is served!



Try This....

To see how this works, cut the tip off a balloon. Go to a pond or stream and find something you want to catch – maybe a leaf, rock or some other small object. Catch the object in your balloon along with the water. Then, outside the pond or stream, slowly push the water out of the balloon until only your object is left inside.



Sherlock Fox Says: Did you know? Pelicans don't breathe through their nostrils – they breathe through their mouth. Think about when you have a cold and can't breathe through your nose. Good thing you know how to breathe like a pelican!



Text by Katherine Young and Deborah Price
Illustrations by Roger Myers

Homemade Butter: A Taste of the Past

by Evangelynn Fortuna

Do you know how to make butter from scratch? Often taken for granted as a grocery store staple, making butter at home connects us with a tradition our ancestors discovered thousands of years ago. In fact, butter is thought to have been accidentally discovered when a prehistoric traveler opened his sheepskin to find that the milk, after jostling on the back of his pack animal, had transformed and solidified. Butter later had many uses across cultures, such as a healing ointment or a role in religious ceremonies. Overall, the repurposing of milk into butter and cheese was important for preservation in a time when refrigerators and pasteurization did not yet exist.

In our own backyard in Boulder County, early homesteaders relied on homemade butter and cheese as staples of their everyday diets. One example was the Walker family, who lived in the Boulder foothills from the late-1800s to the mid-1900s. In addition to Galloway cattle, the Walkers also had milk cows, likely Ayrshire, Jersey or Milking Shorthorns. With that milk, Phoebe Walker made butter to sell at the market in Boulder. Consumers recognized her butter by the rose imprint left by her wooden mold. In 1882, James Walker completed construction of the Spring House, which had a stone floor for spring water to

run over and keep milk, butter and cheese cold. If dairy was stored in the root cellar, it could easily soak up unpleasant odors from vegetables also kept there.

FROM MILK TO BUTTER

So just how does milk become butter? At the time of the Walkers, this magical process began by letting raw milk sit out overnight. The following day, a wooden or brass skimmer was used to collect the cream that had risen to the top (what is left behind is “skimmed milk”). The cream was then poured into a wooden butter churn fitted with a dasher, a rod with an X-shape at the bottom used as an agitator. The

mechanical motion of churning separates the water from the fat particles in the cream. These particles fuse with each other and form larger fat globules, while the air is forced out of the mixture. Eventually the butter separates from the buttermilk, which was then used in baking or milkshakes. For the butter to “come,” the weather had to be just right. An outdoor temperature of 65

degrees was optimal; butter formed in about 20 minutes. On hot days, the butter churned would be soft and kept poorly, but on cold days it would take much longer to form. Once the buttermilk was poured off, the butter was rinsed with cold water and squeezed with wooden paddles to remove any extra moisture. At this point salt could be added, and then the butter was pressed into a wooden mold and finally packed with brine in linen, parchment, or barrels.

Do-it-Yourself: Butter Recipe

Our basic recipe employs an electric mixer instead of a traditional churn. Try your hand at making butter and take a trip back in time!

Materials

- 1 pint (2 cups) heavy whipping cream at room temperature
- 1/8 – 1/4 teaspoon salt
- Stand mixer with whisk attachment (or a hand mixer, food processor or blender)
- Fine mesh strainer

Directions

1. Pour cream into mixing bowl. If the cream fills the bowl more than halfway, make the butter in batches to reduce overflow and splattering.
2. Starting with the mixer on low, gradually increase the speed to medium and continue mixing for 5 to 15 minutes. The variation in time is due to the amount and temperature of the cream.
3. After a few minutes, you will have whipped cream. Keep mixing until it separates into small clumps of butter and buttermilk.
4. Pour out the buttermilk through the mesh strainer into a separate mixing bowl (can be saved for baking) and squeeze out extra with the wooden spoon.
5. Cover the butter with clean, cold water and continue to work with the spoon to remove any remaining buttermilk. Drain and repeat this process several times until the water runs clear. The more buttermilk you separate from the butter, the longer it will last.
6. Add salt and any variations, and work into the butter.
7. Store the butter in a tightly sealed jar, plastic wrap, or wax paper in the fridge for up to two weeks.

Variations to try

- Honey Butter: Add ¼ cup honey
- Garlic and Herb Butter: Add 1 tablespoon finely minced garlic, 2 tablespoons chopped fresh herbs (basil, parsley, etc.) and 1 teaspoon olive oil
- Cinnamon Sugar Butter: Add ¼ cup brown sugar and 3/4 teaspoon cinnamon



Volunteers demonstrate butter-making during a summer event at the Walker Ranch Homestead.

DISCOVER BOULDER COUNTY

Calendar of Events

BIRDS OF PREY DRIVING TOUR

Saturday March 10, 9 a.m.-noon

Space is limited. Meeting location provided to those registered.

Join volunteer naturalists for a driving tour of some of the best areas to view birds of prey. We will carpool from our meeting place searching for raptors, learning about habitat, and working on our observation and identification skills. Dress for the weather, and bring lunch, drinking water, binoculars, a spotting scope, and a bird field guide if you have them. The tour is geared for adults and children age 10 and older. Register at www.bouldercountyopenspace.org/register

BEYOND THE BIG DIPPER

Friday March 16, 7-9 p.m.

Space is limited. Meeting location provided to those registered.

Spring is a great time to learn the location of several easy-to-spot constellations. Learn techniques on how to find those mysterious pictures in the sky, and discover some of the hidden gems that lurk behind the stars we see with our naked eye. Enjoy this family-friendly program, ages 5 and up, followed by sky-gazing with telescopes. Register at www.bouldercountyopenspace.org/register

THE HIDDEN WORLD OF BIRD NESTS

Sunday March 18, 1-3 p.m.

Space is limited. Meeting location provided to those registered.

Bird nests range from a scrape on the ground to intricately woven hanging baskets. Join volunteer naturalists for an easy walk in search of some of these diverse structures created by amazing avian architects. Bring binoculars and a bird field guide if you have them. Register at www.bouldercountyopenspace.org/register

WHOO ARE THE OWLS?

Wednesday March 21, 7-8:30 p.m.

Longmont Public Library, Meeting Room, 409 Fourth Ave., Longmont

Owls have been regarded with fascination throughout recorded history and across many cultures. Over half of the owls recorded in the U.S. have been seen in Boulder County, and most of those owls nest here. Join volunteer naturalists for this slide program to explore these fascinating creatures, and learn about the adaptations that make them such expert hunters.

SPRING HAS SPRUNG!

Saturday March 24, 1-3 p.m.

Heil Valley Ranch Open Space (south trailhead), north of Boulder off Lefthand Canyon Drive, meet at group shelter

Join volunteer naturalists on a leisurely 2-mile hike and celebrate the beginning of spring by looking and listening for signs of new life along the trail. Learn the importance of the sun at equinox in linking and timing these vibrant displays of new beginnings.

SPRING AWAKENING—BEARS IN OUR BACKYARD

Saturday March 31, 1-3 p.m.

Betasso Preserve, Boulder Canyon (Highway 119) to Sugarloaf Road, follow signs to Betasso Preserve, meet at group picnic shelter

Join volunteer naturalists to explore how bears survive the winter and become active again in the spring. We'll also learn how to live safely in bear country. Please wear hiking shoes if you wish to hike the trails before or after the program.

THE GEOLOGIC HISTORY OF BOULDER COUNTY

Monday April 2, 6-7:30 p.m.

George Reynolds Branch Library, 3595 Table Mesa Drive, Boulder

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

PELLA CROSSING: HISTORY AND HABITAT

Saturday April 7, 1-3 p.m.

Pella Crossing Open Space, about 1 mile south of Hygiene on the east side of North 75th Street

Join volunteer naturalists Joyce Costello and Marsha Williams to learn about the history of this area, and the development of the ponds for wildlife habitat. We will also keep an eye out for evidence of birds and other wildlife. All ages are welcome.



Calendar of Events

BIRDING BOULDER COUNTY THROUGH THE SEASONS

Tuesday April 10, 7-8:30 p.m.

Longmont Public Library, Room, 409 Fourth Ave., Longmont

Join volunteer naturalists to learn about birding year-round in Boulder County! This slide program will explore where to go and how to identify some of our local birds. You will also learn about the many challenges birds face and how they adapt to a range of ecosystems and habitats.

RATTLESNAKE HIKE

Saturday April 14, 10 a.m.-12:30 p.m.

Ron Stewart Preserve at Rabbit Mountain, NE of Lyons on north 55th Street, meet at group picnic shelter

Enjoy a moderate 2-mile hike to learn about this reptile found in the plains and foothills. Volunteer naturalists will share information about the prairie rattlesnake, including how to be safe in rattlesnake country. Bring water and wear closed-toe hiking shoes.

SPRING MIGRATION BIRD WALK

Saturday April 21, 8-10:30 a.m.

Space is limited. Meeting location provided to those registered.

Join volunteer naturalists to explore the joys of bird watching during prime migration season! Learn tips for recognizing different types of birds. Be prepared for a slow-paced walk of up to 2 miles. Bring water, walking shoes, binoculars and a bird field guide if you have them. Register at www.bouldercountyopenspace.org/register

GEOLOGY HIKE AT RABBIT MOUNTAIN

Saturday April 28, 9 a.m.-12:30 p.m.

Rabbit Mountain Open Space, NE of Lyons on north 55th Street, meet at group shelter

Join volunteer naturalist Roger Myers and others on a moderate 2-mile hike, where you will learn about the unusual geology of the area. We'll also watch for spring wildflowers, soaring raptors, and other wildlife. Bring water, sunscreen, closed-toed hiking shoes, and binoculars if you have them. This program is geared to adults.



WILDFLOWERS OF BOULDER COUNTY SLIDE PROGRAM

Wednesday May 2, 6-7:30 p.m.

Lafayette Public Library, 775 west Baseline Road, Lafayette

Join volunteer naturalists for a slide program to kick off the wildflower season! You'll learn about the diversity of wildflowers from the plains to the alpine, where and when to look for them, and interesting stories about some of our native plants.

GOATS GALORE – MEET AND GREET

Saturday May 5, 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, housing and feed requirements, and see a live milking demonstration.



I SPY BEAKS AND FEET!

Wednesday May 16, 10-11:00 a.m.

Walden Ponds Wildlife Habitat, 75th Street between Valmont Road and Jay Road, meet at shelter near Cottonwood Marsh

Join volunteer naturalists to learn how a bird's beak and feet help them find and eat their favorite foods. We will watch for local birds and find out where they live, eat, and have babies. This program is for preschool and early school-aged children and their families.

FOSSILS AND FLOWERS

Saturday May 19, 9:30 a.m.-noon

Space is limited. Meeting location provided to those registered.

Join geologist and volunteer naturalist Sue Hirschfeld and others for a short, moderately strenuous hike to explore a landscape created by folding and faulting as the Rocky Mountains began uplifting 65 million years ago. You will see fossilized evidence of the Cretaceous seas that once inundated this area, as well as early blooming wildflowers. Bring water and hiking shoes.

Register at www.bouldercountyopenspace.org/register

ANCIENT BEACH WALK

Sunday May 27, 9-11:00 a.m.

Space is limited. Meeting location provided to those registered.

Join geologist and volunteer naturalist Sue Hirschfeld on an easy walk to see the fossils and unusual geologic features formed in this near-shore marine environment. We will also watch for some of the plants and animals that live here today. Please wear hiking shoes—there's lots of prickly pear cactus!

Register at www.bouldercountyopenspace.org/register

great
for kids!

great
for kids!

Senior Fish-off



Friday, April 20, 6:30 a.m.-10 a.m.
Wally Toevs Pond at Walden Ponds Wildlife Habitat, 75th St, between Valmont Road and Jay Road, Boulder

The trout have fattened up and are biting! Prizes will be awarded for heaviest rainbow trout, most experienced (oldest) angler, best fishing hat, and first to catch the limit.

- Open to seniors 64 years and older.
- All anglers must sign in—no fishing before 6:30 a.m.
- Valid 2018 Colorado fishing license required.
- Live bait and artificial flies/lures permitted—bring your own fishing gear.
- Wheelchair-accessible fishing pier is available.

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



NATURE DETECTIVES: PELICANS ON PATROL

Thursday May 31, 10-11:30 a.m.

Space is limited. Meeting location provided to those registered.

Pelicans are an ancient bird found the world over, but not all species act the same. Discover fun facts about the American white pelican that summers in Colorado, and learn how this easily-seen bird finds food and survives. Designed for children ages 5-10 and their adult companions, with hands-on activities. Register at www.bouldercountyparkspace.org/register

great
for kids!

All Programs:

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

Spring Wildflower Hikes

Wildflower Hike at Legion Park

Saturday May 5, 1-3:00 p.m.

Legion Park Open Space, east Boulder on Arapahoe Road, one half mile west of 75th Street

Join volunteer naturalists for a leisurely spring stroll through the pinyon and ponderosa pines. Besides having a great view of the Continental Divide, this park is a wonderful place for early season wildflowers.

Mother's Day Wildflower Hike at Rabbit Mountain

Sunday May 13, 10 a.m.-noon

Ron Stewart Preserve at Rabbit Mountain, NE of Lyons on north 55th Street, meet at group shelter

Join volunteer naturalists for a moderate 2-mile hike that will take you from grassland to ponderosa pine and mountain mahogany shrubland in search of early bloomers.

Wildflower Hike at Bald Mountain

Saturday May 26, 10 a.m.-noon

Bald Mountain Scenic Area, 5 miles west of Boulder on Sunshine Canyon Drive (Mapleton Ave. in Boulder city limits)

Join volunteer naturalists for a wildflower hike in the beautiful foothills west of Boulder! We will hike about 1.5-miles through forest and meadows in search of spring wildflowers, and enjoy some beautiful vistas along the way.

Wildflower hikes are open to all ages, and are geared to beginners. Please wear hiking shoes, bring water, and a wildflower guide if you have one.

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.

Thursday March 29, Walker Ranch, meet at the Myers Homestead Trailhead, lower parking lot.

Thursday April 26, Walden Ponds Wildlife Habitat, meet at the group shelter at Cottonwood Marsh

Thursday May 31, Agricultural Heritage Center at the Lohr/McIntosh Farm

Youth Corps Recruiting

Opportunity for Boulder County Youth

Each spring the Boulder County Youth Corps gears up for its busy summer season. Sponsors are planning many projects that corpsmembers will work on during the 8-week employment program for Boulder County youth ages 14-17. The department is recruiting to fill 160 corpsmember positions and 34 leader openings. Corpsmember applications will be accepted through Friday, March 30, and girls are encouraged to apply. Leader applications from those 18 and older will be taken online until all of the positions have been filled. Challenge yourself this summer by joining the Youth Corps! Find more information and apply at www.BoulderCounty.org/youthCorps



Members of youth corps celebrating completion of a flagstone patio at the fairgrounds.



Spring Out for Spring Break

Welcome the spring season by getting outside! During spring break visit a Boulder County Parks and Open Space location, take a selfie or a photo with your friends or family, and submit it to Facebook, Twitter, or Instagram with the hashtag #BoCoSpringOut. After spring break, we'll do a random drawing and award five outdoor prizes to the winners!

- Visit www.BoulderCountyOpenSpace.org/trails for a full listing of county parks and open space.
- Up to five photos can be submitted, but they must be at five different parks.
- In your submission, be sure to include the name of the park where the photo was taken.
- Each photo must include at least one person who is a student, teacher, or school administrator.
- A photo must be defined as "public" in your social media platform in order for it to be viewed and submitted.
- Contest period is from Saturday, March 24 through Sunday, April 1, 2018.
- Five grand prizes will be awarded.

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

Boulder County Joins the Great American Screenout

Boulder County joins Defeat Melanoma this year to provide free sunscreen at local trailheads. The campaign, called "The Great American Screen Out!" aims to increase sunscreen usage by making sun protection easily accessible, ultimately preventing skin cancer diagnoses.

Prevent Skin Cancer:

Sunscreen usage, combined with annual skin checks, can prevent 90 percent of melanomas from becoming deadly.

People should seek shade when possible and use physical barriers such as long sleeved shirts, long pants, and wide-brimmed hats in addition to sunscreen when they are going to be outdoors.

Trailheads with free sunscreen: Pella Crossing, Hall Ranch, Carolyn Holmberg Preserve at Rock Creek Farm (Stearns Lake trailhead), Coalton trailhead, Lagerman Agricultural Preserve, and Ron Stewart Preserve at Rabbit Mountain



People who spend time outdoors in Colorado face increased UV exposure due to the altitude.

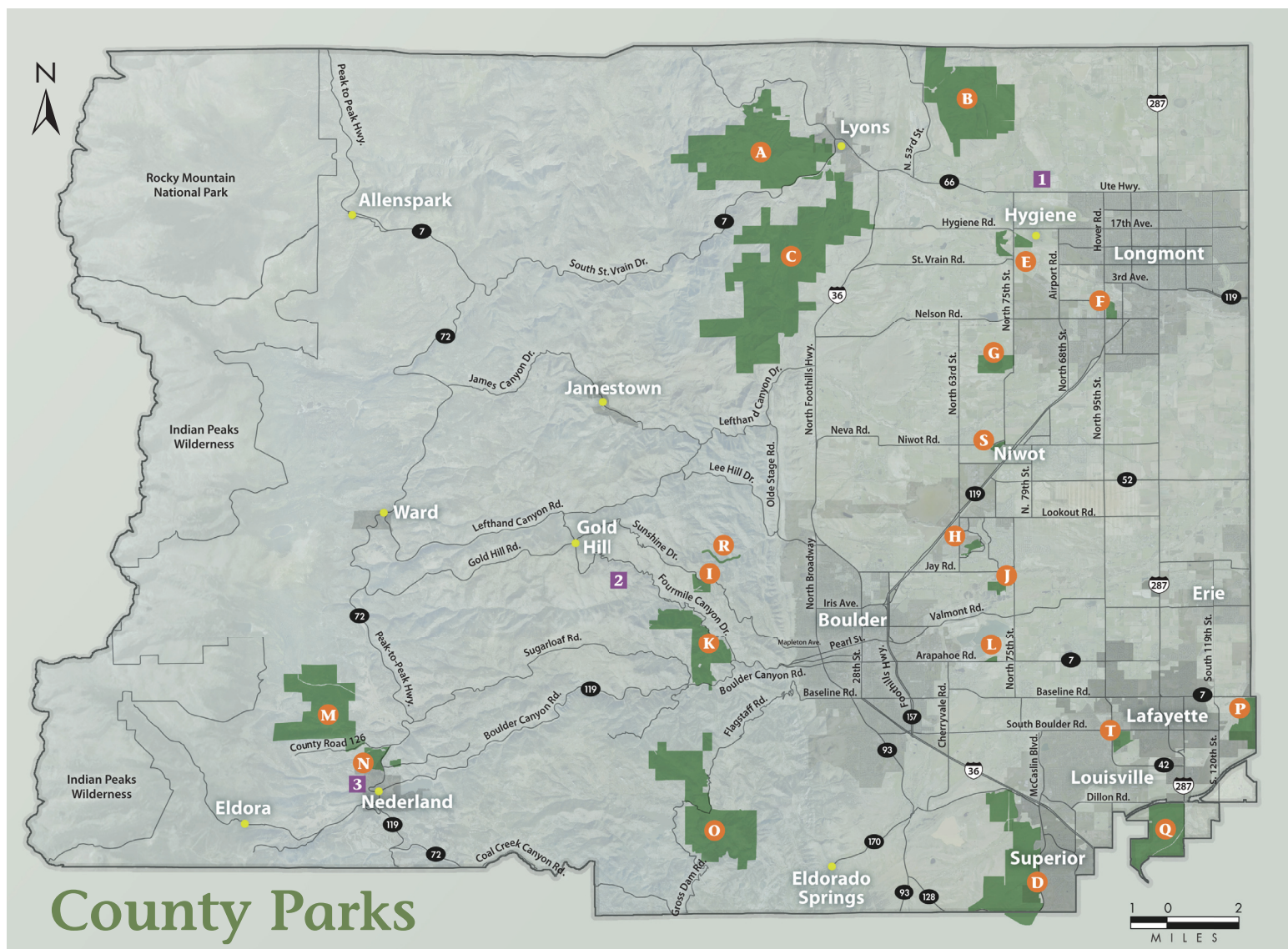


Parks & Open Space

5201 St. Vrain Road, Longmont, CO 80503

www.BoulderCountyOpenSpace.org

303-678-6200



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| A Hall Ranch | F Boulder County Fairgrounds | L Legion Park | R Anne U. White |
| B Ron Stewart Preserve at Rabbit Mountain | G Lagerman Reservoir | 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 |