



ALL THE DOTTED LINES

by Lynne Geweke

“I’ve hiked all the dotted lines in Rocky.”

As a longtime volunteer at Bear Lake and the Alpine Visitor Center, I’ve used that line many times. Yes, to the young, fit and daring hikers just off the park shuttle bus, that aging lady volunteer (me) in front of you may look slow and creaky, but she really has hiked all 355+ miles of trail in Rocky, and she’d love to help you plan your hike. She’s also learned a few lessons along the way that she’d be happy to share.

How does a suburban kid from the flattish Midwest end up spending a lifetime hiking Rocky’s trails? I think it’s genetic, that I was born to be a mountain person. Beaches are okay, but on my first family camping trip to Rocky with my parents and younger brother in 1964 I fell in love with this park. Hard. My mother is now 99, but

she still remembers that when it was time to return to Wisconsin, I sat in the back of the car and sadly watched the receding mountains until they disappeared.

On that trip I took my first real hike in Rocky, to Lake Haiyaha. I’m pretty sure we hiked in canvas tennis shoes, since hiking boots or even modern running shoes were not yet part of the tourist wardrobe. That blister-raising hike laid down my first five miles, as well as a burning desire to return to this magical place for more.

Lesson #1: Invest in proper footwear. Ouch.

I married in 1970, to a man who had never really hiked, never camped, and never been farther west than the Mississippi River. What a lovely challenge! John was game to learn, so in the summer of 1972, we planned a circle route of Rocky Mountain, Yellowstone and Glacier national parks. We even bought our first-ever

hiking boots and backpacks. We started at Rocky with a first-day hike to Chasm Lake, followed by our first-ever backcountry overnight on the Fern-Odessa loop.

Lesson #2: Altitude sickness is real. Chasm Lake on the first day was maybe a bad idea.

Lesson #3: Marauding animals will eat your breakfast if you don’t store it properly at your campsite, and you’ll have to hike out hungry. Fortunately, they were only little animals.

Despite those, er, *rocky* starts, we knew we wanted to come back for more. The next summer found us on the North Inlet and Tonahutu trails, looping from Bear to Grand Lake and back over the course of five days. We had the full spectrum of weather but still remember the last traverse over the Bighorn Flats back to Bear Lake as one of the most glorious mornings ever.

(Dotted Lines continued on page 12)

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Dear Friends,

When I last wrote in the *Spring Quarterly* it was mid-April and we had entirely shut down all public-facing operations of the Conservancy due to COVID-19. It's now July, and today, many of our facilities and programs are operating smoothly in what we've been calling "the new abnormal" phase of operations (knock on wood). Most of our Nature Stores in Rocky Mountain National Park are open for the season, utilizing safety measures such as social distancing, visitor occupancy limits in the stores, masks, and more. Our Conservation Corps crews are operating at about half capacity, and not in Rocky this summer, but mostly as previously planned with many of our regional Forest Service partners. Plexiglass, facemasks, timed-entry permits and endless hours of video conferencing replacing in-person meetings aside, there are brief moments of near normalcy as we adapt, and at least for me, those moments almost always occur when I find myself outdoors.

For many of us, the pandemic has forced us to move all limited social interactions outside, and while I can't wait to put this terrible public health crisis behind us, I hope that some of these newfound social and recreational patterns stick with us. Rather than meeting with friends on a Friday night for happy hour at a local watering hole, this summer, I've found myself at a trailhead with them at 6 a.m. on a Saturday morning. In lieu of movie night, we could be found munching snacks together on the shores of Lake Ypsilon alongside a curious marmot. It's great to see that many of the visitors to Rocky and our public lands these days are rediscovering the joys of nature now that the summer concerts and festivals have been canceled. I hope that when this pandemic passes that folks will hold on and remember the transformative experiences that are to be found in these magical places. Perhaps they too will become lifelong stewards of these places that we work to protect.

Thanks to the support of members and donors like you, in spite everything, we are still on track to fund more than \$1 million dollars for critical projects in the park this year, including scientific research, endangered species re-introduction, historic preservation, trail repairs and more. Thank you to all of our staff, Corps members, Fellows, board members, partners, and federal agency staff and volunteers who have continued to work moving forward during this unprecedented time. And a special thanks to all of you who have renewed your memberships, made a gift, or made a kind remark to a Nature Store clerk, or bought Conservancy facemasks on our website. Your generosity and dedication to helping the park has not gone unnoticed, not by us humans, nor the critters of the park. Stay safe and well, and I hope to see you on the trails when the time is right.

Best,

Estee Rivera Murdock

Executive Director



Photo: Jim Ward

Shop Conservancy Nature Stores for All Your Rocky Memorabilia This Summer



Longs Peak Face Mask – RMNP Exclusive Image

This custom designed RMNP mask features an image of iconic Longs Peak. 100% cotton inside; includes two filters for optional additional

layering. Elastic ear loops, one size fits most adults. Machine washable. Price: \$9.99; **Member Price: \$8.49**

RMNP Trail Ridge Road T-shirt

Relaxed and cozy, this RMNP t-shirt features a fun graphic of Trail Ridge Road in the middle of a compass on the front, and a map of Trail Ridge Road on the back. 52% cotton, 48% polyester; S – XXL.

Price: \$22.99; **Member Price: \$19.54**



National Parks of America 1000-Piece Puzzle

Incredibly detailed, this map highlights historic places, popular attractions, indigenous wildlife, and mountain ranges unique to each site. Made in USA of the highest quality recycled blueboard. 19.25" x 26.75".

Price: \$18.99; **Member Price: \$16.14**

Pika Pottery Mug

This RMNP Deneen pottery mug features an exclusive pika design circled with "Rocky Mountain National Park" script. Dishwasher and microwave safe. Made in the USA.

Price: \$19.95; **Member Price: \$16.96**



RMNP Bucket Hat

The perfect hat to hike in the sunshine of Rocky Mountain National Park! This hat features a minimalist mountain graphic to highlight. Color: navy. 100% polyester and adjustable (adult size). UPF 50+.

Made in USA.

Price: \$26.95; **Member Price: \$22.91**

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Cover photo

"Early Summer Sunrise" Photographer: Crystal Brindle

Photos are always appreciated! Scenery, wildlife and wildflowers greatly enhance this publication, so get out there and take a hike!

Please send high-resolution images to: nancy.wilson@RMConservancy.org by September 1 for publication in the 2020 Autumn Quarterly.

Thank You!

Ask Nancy

Quarterly Editor Nancy Wilson attempts to unearth answers to any questions asked by Conservancy members and park visitors. If you are curious about something in or about the park, email nancy.wilson@rmconservancy.org or write: Nancy Wilson, Rocky Mountain Conservancy, PO Box 3100, Estes Park, CO 80517.

Does the park ever get any exotic or non-native wildlife in the park? What is the park's response to these occurrences? The park has many exotic and non-native species present. Twelve species are considered invasive, including the rock dove and common starling which are present but not actively managed. The park also works in collaboration with researchers to monitor for gypsy moths in the park, although to date, all documented gypsy moth observations were near campgrounds and are believed to be "hitchhikers" rather than an established population. The park reports on these animals annually, but in most cases no action is taken. When a species poses a significant threat to native park resources or to our ecological restoration objectives, we have actively removed them to protect our native species. An example of these actions is removing non-native fish such as the brook trout, which is native to eastern North America, in order to make the habitat available for our native greenback cutthroat trout. — *RMNP Wildlife Biologist Mary Kay Watry*

How does the Thumb trail work on Prospect Mountain in Estes Park fit into the Conservancy's mission? The Rocky Mountain Conservancy's mission is to promote stewardship of Rocky Mountain National Park and similar lands through education and philanthropy. By engaging the Conservation Corps in the trail work accessing the Thumb and Needle on Prospect Mountain, the Conservancy is supporting stewardship of this future local park, providing opportunity for increased education of diverse land management agencies among corps participants, and providing in-kind support to local parks surrounding Rocky Mountain National Park. The Conservation Corps program was established in 2003 with a single crew working in Rocky Mountain National Park. Since 2005, the Conservation Corps program has operated crews on lands outside of Rocky Mountain National Park to support stewardship work and provide service-learning opportunities. By partnering with other public land agencies the Conservancy is able to provide more opportunities for young adults to gain stewardship skills, advance their professional development, and learn about public lands. — *Conservancy Director of Conservation Geoff Elliot*

I saw a coyote with very light coloring on Trail Ridge Road this spring. Does the fur of wildlife lighten from high altitude sun, or is it more likely just a color variation in coyotes? Coyotes do have a fair amount of genetics-driven variability in the color of their pelage, from light gray or tan to very dark, even black in some locales. In this case, I suspect the cause is sun bleaching. Coyotes shed once a year, in late spring/early summer, so it's likely this coyote's fur had been exposed to high altitude sun and its bleaching effects for close to a year. I've seen a similar phenomenon in elk that winter in the alpine, showing an extremely light, almost white, coat before they shed to their summer coat. — *Retired RMNP Wildlife Biologist Gary Miller*



The Rocky Mountain Butterfly Project was started by Rich Bray (left) in 1995. More than 50 volunteers, including Bray, Stephanie Mason and Erin Raun (right), have contributed nearly 40,000 hours to the project over the last 25 years. Photo: NPS/Rich Bray

Delicate, yet hardy. Colorful, yet shy. Butterflies are a delight to see throughout Rocky Mountain National Park, and no one feels that more strongly than Stephanie Mason, longtime naturalist and butterfly researcher for the Rocky Mountain Butterfly Project (RMBP). “As a naturalist and environmental educator, I have always been interested in the spineless wonders that really run the world: insects. I also have a fondness for plants, so studying butterflies — which are reliant on the plant kingdom in all stages of their lives — was a natural.” The year 2020 marks the 25th year of the RMBP, a long-term inventory and monitoring project.

For a couple weeks in June and during the full month of August, Stephanie bases herself at McGraw Ranch, a research facility run by Rocky Mountain National Park’s Continental Divide Research Learning Center. From here, she conducts butterfly surveys throughout the park. Unlike other researchers who leave for the field at the break of dawn, Stephanie can enjoy a more leisurely morning. Butterflies are not early risers but rather become active mid-morning when temperatures warm up. Stephanie, a morning person unlike her study subjects, takes the morning to review her data from the day before, evaluate the weather, and prepare

for the day’s work. Surveys are restricted by weather; low winds are important, and temperatures must be above 12°C for transects in the montane and above 10°C for transects in the subalpine and alpine areas. Not every day is a survey day, so when the conditions are right, Stephanie spends as much time as she can in the field.

Six one-kilometer butterfly transects are surveyed weekly during Stephanie’s research trips. The transects are spread across the park to represent different elevations, different habitat types, and both the east and west sides of the Continental Divide. Surveys are based on the British Pollard Count scheme, a method by which the observer walks along the transect and counts and identifies all butterflies seen within a 5-meter cube extending directly in front of them and 2.5 meters on either side of them. Identifying butterflies on the wing isn’t always easy, and so Stephanie brings a butterfly net

with her in case she encounters a difficult case. However, with more than 20 years of experience identifying Rocky Mountain butterflies, the net, which she is allowed to use under her research permit, is a tool she rarely needs.

“As a naturalist, the chance to go back to the same place year after year after year and observe what’s the same or what’s changed — either dramatically or subtly — is an invaluable lesson in ecology.”

— Stephanie Mason

Rocky Mountain Butterfly Project, 25 Years and Counting

by Carissa Turner



Stephanie counts and records butterfly species, plants in bloom, and weather along the Cow Creek transect. Photo: NPS/Carissa Turner

The RMBP surveys aren’t strictly about butterflies. Flowering plants are documented, both as a flowering bloom index (a scale from 0–10 that indicates the relative number of blooms observed, from none to the maximum possible) and as a list of the most common species observed in bloom. Weather, including temperature, wind, and amount of sunshine, are also recorded. On non-survey days, Stephanie spends time comparing trends in butterfly abundance from her surveys with long-term regional climate data.

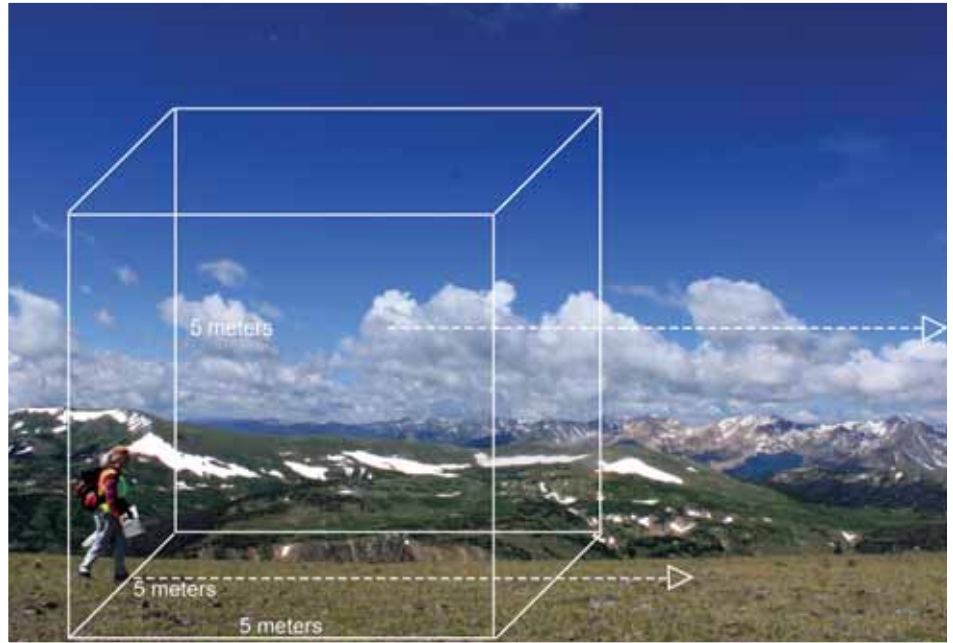
The RMBP was started in 1995 by Richard Bray, a retired realtor with a love of butterflies and the Rocky Mountains. An amateur lepidopterist, Bray worked with Dr. Paul Opler, an entomologist from Colorado State University, and park biologist Therese Johnson to design the survey and identify transect sites. Stephanie, who joined the team in 1998, helped test and refine the survey methods along the original 33 one-kilometer-long transects.

Between 1995 and 2011, the RMBP tallied thousands of volunteer hours as they conducted more than 4,000 surveys and documented 140 species of butterfly in the park — an increase of 50 percent from the previously-known list of 94 spe-

cies. Today, the list sits comfortably at 141 butterfly species.

In 2011, Bray retired and Stephanie took over the project as the primary investigator to ensure continuity of data collection. Stephanie, a senior master naturalist with the Audubon Naturalist Society in Washington, D.C., is an advocate for long-term research: “One of things that surprised us early on during the project was that some butterfly populations would seem to suddenly crash. And then, in just another couple of years the number of individuals (their abundance) had climbed back up to earlier levels. We learned that butterflies (and many insects) can respond quickly to environmental impacts, such as a seasonal drought, but that they can recover quite quickly as well unless the impact is persistent. In fact, some insect species naturally use population build-ups and crashes to control predator levels. This is why long-term monitoring is so important to determining whether a change in abundance is just short-term or long-lasting.”

This dedication to both the species and the science brings Stephanie back to Rocky Mountain National Park year after year. Even amid annual changes in butterfly numbers, Stephanie has noted an overall decrease in their abundance, an observation backed by data that is consistent with observations around the world. This decrease in the abundance of butterflies and other flying insects is also known as the “windshield phenomenon.” Think of a road trip from the past where there would be many insects splattered on the windshield of the car, and then compare that to a recent road trip — fewer dead insects, right? That is the “windshield phenomenon.”



Stephanie conducts a survey at Lava Cliffs according to the British Pollard Count method, counting and identifying butterflies within a 5-meter cube that moves with her along the transect line (lower dashed line). Photo/graphic: NPS/Vishva Nalamalapu

Although resilient, butterflies are still at the mercy of changes that can have long-term impact on their existence. Climate-driven changes in water availability and plant phenology could lead to fewer resources at each life stage. Development outside protected areas could impact migratory routes and critical habitat. Agricultural pesticides can affect non-target species, including butterflies. The RMBP provides a long-term view of butterflies inside the park, but butterflies don’t necessarily stay in the park, and conditions outside the park play an important role in the long-term existence. “As a naturalist, the chance to go back to the same place year after year after year

and observe what’s the same or what’s changed — either dramatically or subtly — is an invaluable lesson in ecology.”

Stephanie will be continuing her work on the RMBP this summer. In fact, 2020 will be a fantastic year for the project as Stephanie will be able to conduct her surveys throughout most of the summer. This is great news, since July surveys haven’t been conducted in the park since 2011.

What new and interesting observations will she have the joy of observing and documenting this summer?

Carissa Turner is the RMNP Science Communication Coordinator at the Continental Divide Research Learning Center



Weidemeyer's Admiral (*Limenitis weidemeyerii*). Photo: NPS/Rich Bray



Hoary Comma (*Polygonia gracilis*) Photo: NPS/Rich Bray



Rocky Mountain Parnasian (*Parnassius sminthius*). Photo: NPS/Rich Bray

Support Rocky’s resource management programs by donating to the Rocky Mountain Conservancy at RMConservancy.org, or call 970-586-0108

Conservancy Donates High Resolution GIS to Rocky to Enhance Plowing Safety

by Shawn Wignall, GIS Specialist, and Cheri Yost, Park Planner

Rocky Mountain National Park staff use a Geographic Information System (GIS) to locate and map a wide variety of park assets, including natural and cultural resources, utilities, buildings, roads and the park boundary. Collecting these data with a high degree of accuracy requires specialized equipment, significantly more than the location application on our phones, and even most handheld Global Positioning System (GPS) units. GPS-enabled smartphones are typically accurate to within 3–5 meters, which sounds reasonable since you could find a building or a trail at that resolution. But could you find the



Two challenges of maintaining the centimeter accuracy needed for navigation are the distance between the base station and the roving Arrow Gold receiver and the mountainous terrain that can prevent the base station and receiver from communicating. To overcome these obstacles, the park transmits real-time differential corrections over the park's digital radio band from the GNSS reference station located near headquarters to an Arrow Gold receiver (in the foreground, donated by the Conservancy) located in the field.

unmarked corner of a forest monitoring plot to assure you are in the exact same place as last year? Could you precisely pinpoint the park boundary? Could you improve safety during Trail Ridge Road snowplowing operations? The Rocky Mountain Conservancy's recent donation of a high-accuracy Global Navigation Satellite System (GNSS) receiver allows the park to do these remarkable things.

Park staff utilizes submeter GNSS receivers to locate and map the majority of the park assets. However, for high-accuracy data collection and real-time navigation, park staff needed an additional three pieces of specialized and costly equipment. First, we needed a base station, or a non-mobile GNSS reference receiver that records its precise location using all satellite constellations available at any given time. This precise location is used to correct the positions of rover units that are out in the field. With the help of our GIS Specialists at the regional office, the park installed a Coast Guard-donated Trimble NetR9 GNSS reference receiver near park headquarters. The second piece of equipment that we needed, also donated in part



The Arrow Gold is mounted to the top of the park's snowplow for testing this spring. Lassen Volcanic National Park is the only park unit to actively using this technology for snowplow operations. Due to the complexity of the RMNP's radio system, it took many months to reconfigure a similar data radio like the ones being used in Lassen Volcanic NP for use at Rocky Mountain NP. This level of testing could not have occurred without the assistance from the Department of the Interior Radio Lab, the National GNSS PosNav coordinator, and Rocky Mountain National Park's very own radio shop.

by the Conservancy, was an Arrow Gold GNSS receiver, capable of 1 cm real-time accuracy. The Arrow Gold receiver uses data from the reference station to apply corrections to its position thereby providing location data with precision to a few centimeters. The final piece of equipment needed was a couple of mobile radios capable of transmitting data corrections over the parks radio system to allow corrections to be received anywhere within the park's radio coverage.

Last fall, park staff drove a very slow 10 miles an hour (during an early morning sunrise) to record the exact location of the white fog lines, the white lines that road crews paint near the edge of the Trail Ridge Road pavement to help drivers stay on the road. Using the mobile application ArcGIS Collector, these mapped road edges can now be viewed by snowplow operators on a tablet mounted in the cab to safely navigate the road.

With the tablet and the Arrow Gold installed in the cab of the rotary

plow and the antenna mounted top center of the cab (see photos), operators tested the use of this system to navigate Trail Ridge Road during this year's spring opening. We were successful in transmitting and receiving real-time data corrections over the park's radio system proving this as a viable solution for improving safety during park snowplow operations.

The park continues to use snow poles to mark the edge of the road to help mitigate safety concerns and resource damage, but these snow poles are a significant maintenance burden for park staff as they often need to be replaced. During rotary snowplow operations, visibility can become

obscured by blowing snow, making it difficult to see the snow poles. This is especially true in areas where the poles are either missing or broken, yet the ability to stay within the road corridor is critically important to help prevent accidents and resource damage. This year's test proved that once fully implemented, this method of navigation will greatly improve the safety of the snowplow operators on Trail Ridge Road. It will also prevent accidental resource damage caused by driving a heavy piece of equipment onto the tundra, such as soil compaction, crushing plants, or disturbing roadside cultural resources.



To help operators navigate Trail Ridge Road during plowing operations, the Arrow Gold's antennae sits on the top of the snowplow.

Rocky Mountain Conservancy Park Puzzler

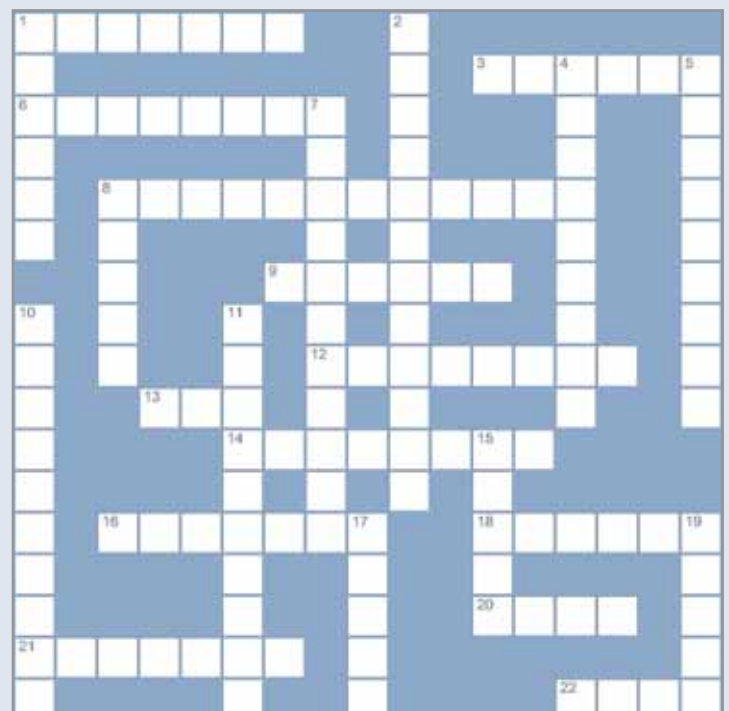
Across

1. The designation of a person who came to Estes Park to settle in the mountainous region that later became Rocky Mountain National Park
3. One of the earliest blooming wild flowers in RMNP, they have fuzzy, crocus-like flowers and are named for the Easter season
6. All water that falls on the east side of the Continental Divide will flow into this ocean
8. This unique work corps made up of young adults reconstructs trails, bridges, historic buildings and more in Rocky and surrounding U.S.F.S. areas
9. Sites that measure the snowfall and other winter conditions to assess water supply and management throughout 11 western states, with 6 in RMNP
12. Bighorn sheep, elk, and coyotes exhibit this form of migration
13. A popular pothole lake hiking destination in the Lumpy Ridge area
14. A teepee of wood created by park sawyers and immolated to reduce vegetative density
16. Road-building efforts encouraged this in the early days of Rocky, which inspired additional improvements to connect visitors with nature
18. Colorado has the most mountains over 14,000 feet tall with 56 exceeding that height. The state of ___ follows in second with 29 14ers
20. Otherwise known as the *pedosphere*, which contains biotic and abiotic components
21. Willow species contain ___, a precursor to the development of aspirin
22. The infamous ___ Lake Flood occurred in 1982 when a dam in the Mummy Range burst

Down

1. This type of strategic opening enables the park to limit the numbers of people entering during the pandemic
2. A primary activity of the Conservancy that supports special projects in Rocky
4. One way that tolerators survive the harsh winters in Rocky is by living underneath the snow in the ___ zone
5. A scientific term for animals that remain active during the winter

7. This organism closed Rocky for more than a month and caused the closure of the Conservancy's Field Institute for the 2020 season
8. This stunning lake sits in a cirque at the base of Rocky's highest peak
10. Ruth Ewald was Rocky Mountain National Park's first female ___
11. The Rocky Mountain Conservancy encourages this kind of engagement to support the operations of the nonprofit organization
15. Soils that are a mixture of three mineral types: sand, silt and clay
17. The northern-most range of mountains in Rocky is called the ___ Range
19. A species that can reproduce vegetatively to create huge stands of genetically identical organisms





Sideview of completed Chasm Junction toilets in context

by Carly Adams, National Park Service

It's no secret that Rocky Mountain National Park (RMNP) has seen a sharp visitation increase within the last half decade. The demand is greater than ever for the park to create new ways to adapt processes and facilities in order to continue to fulfill the mission of the National Park Service (NPS), "... preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations..."

The old backcountry toilets at Chasm Junction were installed in the 1980s, and, over time, they have been some of the facilities most affected by increased visitation. The four toilets were not designed to accommodate the increase in usage as more and more people were making the trek to Chasm Lake and to scale the face of the mountain, and park staff was challenged to make enough trips to pack out the poo and meet expectations for cleanliness. Eventually, protecting sensitive alpine resources became a major concern, and it became evident the toilets were being overwhelmed and functionally at the end of their lifecycle.

When RMNP Chief of Facilities Management Steve Schrempp and Facility Manager Daniel Lawson met with former Chief of Interpretation Rich Fedorchak to ask if the park's partner, the Rocky Mountain Conservancy could help fund a project to replace the toilets Rich was initially skeptical of its alignment with the Conservancy's mission: *The Rocky Mountain Conservancy promotes stewardship of Rocky Mountain National Park and similar lands through education and philanthropy.*

Diving deeper into the proposal, Rich discovered how the project could align with the mission and therefore appeal to Conservancy board members for approval. The project was presented to the Conservancy as a way not only to further the park's mission, but as an opportunity to protect the delicate natural resources of the alpine area while promoting the education of students from the University of Colorado-Denver's ColoradoBuildingWorkshop (CBW). With funding for the project, the students would have the opportunity to spend multiple semesters with park staff on the design of the new toilets.

Before making the decision to contribute \$35,000 for construction materials for the toilets themselves (which included full-scale mock-ups of the final designs), and for some of the transportation of the en-

A pragmatic necessarium:

Conservancy Supports Innovative Toilet Construction on Longs Peak Trail

closures to the site, the Conservancy asked some tough questions to make sure it would fit the mission, as it was an unusual request.

Fast forward about three years, and the Longs Peak toilets have completed their first full season in operation. We are pleased to report that this new era of backcountry toilets has gained a lot of attention for the unique design, including several news articles and multiple national and international architecture and engineering awards.

The CBW students were challenged to construct structures that would be light enough to transport from their campus in Denver, but strong enough to withstand the hurricane-force winds and arctic-like conditions on Longs Peak. Additionally, a unique feature they utilized was an innovative urine-diversion system that



Backside view showing the optics of the toilets' waste collection structures

Summer Education Fellowships Intern Highlights

The Olson Family Fellowship began partnering with Rocky Mountain National Park's environmental education department and the Conservancy's Field Institute programs in 2007. In 2019, the Conservancy partnered with the Brown Family Foundation to include an Education Fellow to create and focus on children's education programs in the park. With Next Generation Fund support, the success of park fellowships depends upon both the generosity of donors and the creativity of Fellows who address the evolving research and educational needs of Rocky Mountain National Park and the Field Institute programs.

Generally, internship duties include: developing professional goals, teaching interactive nature activities and programs, assisting with program development, planning and implementation, completing basic advertising and marketing projects, presenting informational programs about educational activities at RMNP, drafting news releases and feature articles, and engaging in community outreach.

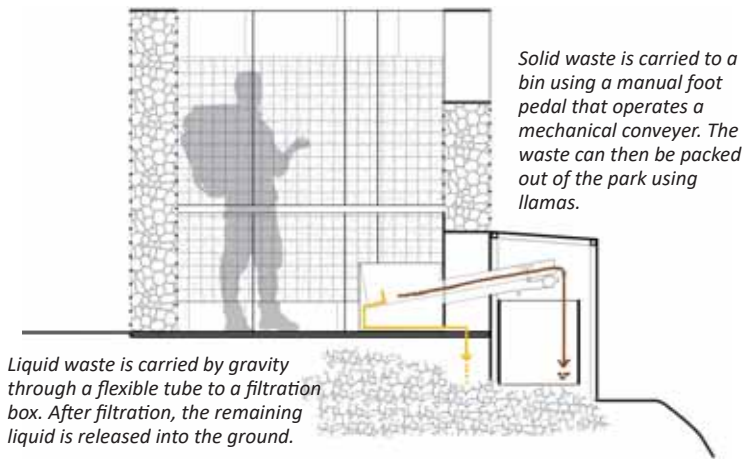
Fellow Carina Kusaka

Carina recently graduated from Colorado State University with a Bachelor of Science in fish, wildlife and conservation biology. Being born and raised in Hawai'i, in a culture that emphasizes the deep connection between humans and the natural world, has helped her develop a strong dedication to conserving it. This upbringing also helped her understand the importance of including diverse groups and cultural knowledge in the natural science field. She hopes to incorporate this mindset and passion to her fellowship experience with the Rocky Mountain Conservancy. While the unusual circumstances this year make it challenging to lead hands-on environmental education programs, Carina plans to develop online education programs to encourage families to learn about the unique ecosystems in RMNP and explore their local parks, natural areas and backyards.



Fellow Cora Bordley

Cora recently graduated from the University of Oregon with a degree in geography after graduating from high school in Pennsylvania. Her passion is JEDI (Justice, Equity, Diversity and Inclusion) within the parks and the outdoor industry which spills into a strong interest in accessibility within the parks and outdoor spaces. Cora is hoping to forward JEDI initiatives within the park, and work with the Conservancy and parks service on ways to make the park more accessible. Additionally, she's also hoping to gain hands-on experience interacting with visitors and providing interpretive outdoor education. Cora goes everywhere with her service dog named Goose, including in the park, and she's excited to share her story. Say hi if you see her on the trail!



Liquid waste is carried by gravity through a flexible tube to a filtration box. After filtration, the remaining liquid is released into the ground.

Solid waste is carried to a bin using a manual foot pedal that operates a mechanical conveyor. The waste can then be packed out of the park using llamas.

separates the solid and liquid waste, creating less bacterial growth and greater waste containment capacity. Ultimately, this equates to a more pleasant user experience and allows for more time between cleanings and packing trips.

"Some students were initially disappointed to find out they would be designing toilets for the program," said Director of the CBW, Erik Sommerfeld. Looking back, he believes the students are proud of their hard work and appreciate the skill-building that came with the design and engineering challenges.

The park is excited to have worked with the Rocky Mountain Conservancy and CBW on the Longs Peak toilets and delighted to have ended up with a pragmatic and efficient result. While this is but one important project in the overall human waste issues the park faces amid the multiple management challenges of spiking visitation, innovative solutions such as these are useful learning experiences for future projects, and the Conservancy is a strong and critical partner in furthering the NPS mission with projects like these.

More details about this project can be found online: search "Longs Peak toilets."



Interior view of the new toilet structure at Chasm Junction

2020 Conservation Corps Season Kicks Off

The Rocky Mountain Conservancy is excited to announce it will be able to host four Conservation Corps crews for a total of 20 AmeriCorps members in 2020. The crews will be based in the Boulder and Sulphur Ranger Districts of the Arapaho-Roosevelt National Forests. These districts border the southern and western borders of Rocky Mountain National Park and encompass more than 500,000 acres, including several wilderness areas.

In the Boulder Ranger District, two crews (Boulder Crews) will work in heavily trafficked areas to restore and improve damaged trails and maintain 50 miles of trail within the James Peak and Indian Peak Wilderness areas. This work will be completed alongside the U.S. Forest Service and Front Range Climbing Stewards.

In the Sulphur Ranger District, two crews (Shadow Mountain Crews) will focus their work on trail structures in wetland areas. These structures include turnpikes (raised trail sections through marshy areas) and bridges on heavily trafficked trails. In addition to these trail structures, the Shadow Mountain Crews will also conduct trail maintenance throughout U.S.F.S. trails in Grand County, including enhancements to the Buffalo



The Boulder Crew completed a rock wall project to help fortify the edge of the trail along the downhill slope to prevent erosion.

Creek Equestrian Trail.

To ensure that these crews are able to operate safely during the COVID-19 pandemic, the Conservancy has worked closely with other corps programs, our public land partners, and health officials/guidance to develop protocols and risk management strategies that mitigate risk to AmeriCorps members, partner agency staff, and the public. These include conducting daily symptom checks for fevers and respiratory distress, as well as providing face masks, additional camping gear, increased cleaning supplies, and additional vehicles to support crew health and safety.

Meet & Greet: 2020 Conservation Corps Field Coordinators



Mary Cretney is excited to be one of this year's Conservation Corps field coordinators to continue her streak through college serving on the Conservation Corps in some capacity or another. Hometown: Mukwonago, WI, then on to pursue degrees in Conservation Biology and Environmental Studies at the University of Wisconsin – Madison. Her first two years on the Corps were spent with the Shadow Mountain Crew in Grand

Lake, and after graduating last May, Mary returned for her first Field Coordinator stint. She recalls one of her favorite Conservation Corps experiences of building a wilderness bridge over Cascade Creek. Mary is excited to be a part of the trail rehabilitation project at the Devil's Thumb and the Thimble, and to foster crew members' connections to each other and their environment this summer.



Gus Anderson This is Gus's second season working as a field coordinator and his fourth season with the program. Hometown: Wausau, WI, and recently graduated from the University of Minnesota where he studied history and global studies. Gus recalls his first summer working as a crew member in the backcountry of the Rawah Wilderness as his favorite. During that summer he discovered his passion for wilderness preserva-

tion and his love for the mountains. He strongly believes that the work with the Conservation Corps has a positive impact on the people and environment around them, and he's excited to meet and get to know all of the new crew members.



Rocky Mountain Conservancy



Become A Member!

The Rocky Mountain Conservancy has teamed up with Parks Project to bring you some cool new threads.

With a \$50 membership, this commemorative shirt can be yours!

Why Join?

Rocky is that place you visit for stunning views of wilderness, where you hike with friends, or join your family for picnics and outings. It's where the kids become Junior Rangers, and where you all go to watch wildlife. It's a special place that makes a difference in your life, and Rocky needs help. Your membership helps to fund the Conservancy's work to preserve and protect the park and its many treasures and resources that we all enjoy.

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RMConservancy.org

From seed to stalk: Park Greenhouse Is a Restoration Powerhouse

by Sarah Ilsley, AmeriCorps Conservation Legacy Vegetation Intern

I consider myself lucky to work in the Rocky Mountain National Park (RMNP) greenhouse. It's a quiet and peaceful place, especially in the early mornings when the air is cool and new. When the birds sing outside and the sprinklers create a hydrating mist over the vegetation within, the greenhouse can take on a rainforest-like feel. There's something healing about growing and nurturing living things, and so the work feels more like meditation than anything else.

The greenhouse is funded by the Rocky Mountain Conservancy, and it serves a very important role in Rocky Mountain National Park – it allows us to take on restoration projects that are important for the health and preservation of ecosystems around the park. This year, the greenhouse is home to 21 species of plants, and we are slowly climbing toward a goal of around 59,000 individuals.

There are many reasons why these particular plants were chosen for revegetation. Each year park staff, interns and volunteers collect the seeds from the park itself. All are locally native, and the species grow together in the habitats, soil types, and microclimates of the restoration sites. They often help one another to succeed. Take *Artemisia ludoviciana*, the elegant and frosty white sagebrush, for example. Where it resides many other native species often grow under its shade-giving foliage. These species benefit from the protection from the sun, especially while they are delicate seedlings.

Projects around utility lines require plants with shallow root systems such as grasses and forbs, which are not likely to disturb infrastructure. We also choose aggressive native species to colonize disturbed ground in an attempt to decrease the opportunity for exotic species to take hold. While a favorable outcome is not guaranteed, we hope that succession (a cumulative change in the types of plant species that occupy the area through time) will take place so that what we plant is replaced by plants that will make the site more closely resemble the surrounding community.

In addition, the plants chosen for restoration have generally grown well for us in

the past and produce enough seed in the wild to sustainably collect without over harvesting. Around 33,600 plantlings currently live in the greenhouse. That doesn't include seedlings in germination trays still waiting to be transplanted. But how did they come to be there? What processes did they go through in preparation for this stage and what's going to happen next?

After the seeds are collected, they need to be "cleaned." Cleaning means stripping them of their chaff, or husky coatings, and removing any extra organic matter. First, staff and volunteers dry the seeds and remove the chaff using sieves, a food processor, or a technique called winnowing. Winnowing refers to any technique where air currents pass over seed and chaff, thereby separating the two. We spread the extra organic matter back into the ecosystems it came from. We then weigh the seeds, package, and store them in our climate-controlled seed cooler, which is

kept at approximately 40°F with 30 percent humidity. While some seeds are viable for just a few years, others keep for a surprisingly long time. This year's oldest seed is *Carex chalciolepis* from 2005. Our *Muhlenbergia montana* (mountain muhly) is from 2007. Much of the seed kept in the cooler is broad-

cast seed — seed that is not germinated in the greenhouse, but is meant to be scattered throughout more expansive restoration areas.

Seeds of different species require different methods of stratification, or exposure to environmental conditions, to prepare them for germination. Some are dampened and cooled for 30–90 days in a refrigerator, freezer or even outside during the winter. Some species do best outside because they need the UV radiation and freeze-thaw cycles to tell them that Spring Is Here and the Time Has Come to germinate. Some seeds undergo a naturally occurring phenomenon called scarification, a breaking of the seed coat, to encourage germination. One way in which we try to mimic natural scarification is by using a food processor. And then others are simply sown directly into fine soil. All are later trans-



A view inside the RMNP greenhouse during a high-propagation time

planted into cones for root establishment.

Once the seedlings have had time to grow and establish, they are "hardened off". This means that they are put outside, and measures are taken to gradually acclimatize the plants to the conditions they will experience at the restoration site. We entered this stage with many of our plant species in early June and moved plants outside to be hardened off for at least two weeks. With roots throughout the pot, numerous leaves and hearty stems, they soon are ready for revegetation.

This year RMNP's vegetation program has six revegetation projects in the works. Three of these are around park headquarters while the other three are in alpine areas of the park. Like much of the world, operations here have been affected by the COVID-19 virus. With fewer staff and volunteers able to work, we've made less progress toward our goals than originally planned. Though it's unlikely that we'll be able to meet all of our project goals, remaining seedlings will overwinter in the nursery and be ready to finish the projects next year.

Rocky Mountain National Park does battle against a multitude of invasive species every year. In their native range these species have been coexisting with other plants and animals for thousands of years, where they have evolved to keep one another in check. Here, the invasive plants run rampant and out-compete native species ill-equipped to live alongside them. Fewer native plants means less diversity and more ecosystem instability.

Restoration efforts are important on many other levels as well. Restored ecosystems also provide habitat and food sources for wildlife. They reduce loss of critical topsoils and lessen erosion of streambanks and hill-tops. This can decrease sedimentation levels in streams, which improves water quality.

With all the work to be done, we're lucky to have restoration programs such as ours in place and a greenhouse to call our own.



(Dotted Lines, continued from page 1)

Lesson #4: Bring a deck of cards for when you can't even sit up in your tiny tent and it's pouring out. For hours.

The next quarter century revolved around hiking with two boys in tow. Despite not living near Colorado (some annoying detail about needing to have jobs), we managed to get back to Colorado many summers. We usually stayed a week or two in a cabin in Estes Park but always included a lot of hiking and a backpacking night or two.

When our first son, Andrew, was four, my husband took him backpacking, all the way to Mill Creek Basin, a whopping 1.8 miles from the trailhead. Of course, my husband's pack had all the equipment, and our son carried only a day pack with his beloved panda inside. It began hailing about a quarter mile into the hike, but they persisted, the weather cleared, and they survived to have a wonderful evening. (I stayed back with our younger son, Alan. Diapers were not on my backpacking radar.) Years later, an adult Andrew was reminiscing about that trip and suddenly blurted out, "Dad, you were a saint!" Not a bad transformation for that originally non-hiking, non-camping Easterner.

As the boys grew, so did our destination list. Ouzel Lake, Thunder Lake, Timber Lake, Lawn Lake, Lake Nanita, Twin Sisters, Flattop, Hallett, and more. We kept laying down mileage along those dotted lines. We even got daring enough to go off the dotted-line trails a bit, orienteering in that pre-GPS era into the Gorge Lakes, and to the backcountry campsite at Little Rock Lake. Eventually we four all managed the Mother of all Dotted Lines — Longs Peak!

Lesson #5: Don't think all this went smoothly. At some point kids inevitably melt down on the trail. Actually, that happens a lot. Years later they will accuse you of being Death March Hikemasters, but they will also grow up to love hiking. Go figure.

By 2000, the boys were



1982. Andrew and Alan with their packs on the way to Moore Park on our first backpacking trip as a family. Getting all the way to Longs Peak would take a few more years.

grown, and John and I were hiking as a duo again. We realized we were never going to get tired of hiking in Rocky, no matter how many times we visited Dream or Mills or Black or any other lake or peak. Clearly it made sense to plan for retirement in Estes Park. We bought a house and stocked it with park maps and hiking books.

And this is where the plan to hike all the trails was hatched, in our new home amid all those books and maps. Around 2005, while looking for new dotted lines, we realized that we had already hiked about 85 percent of them. Now we had a challenge. We quickly saw that the remaining 15percent included some of the more remote spots in the park, such as Haynach Lakes, the Comanche Peak

area, and Black Canyon. Finishing this project required some serious planning, vehicle shuttling, and backcountry camping over the next few years.

Lesson #6: Sometimes Mother Nature decides you aren't going to make your destination that day or even that year. Second and third tries are a fact of life in the mountains.

At last, though, one day we hiked out of the southwest corner of the park on the East Shore Trail, and it was done. Every single dotted line in Rocky!

Which brings us to Lesson #7, the happiest lesson: There's not a trail in the park that isn't worth hiking.

Some, like Black Canyon, don't have a clear "destination" to them — but that just means hours of pleasant solitude. Others, like some trails in the Mirror Lake area, require a backcountry camp and good weather luck — but offer the chance to bag less-climbed peaks and view the park from a new perspective.

And some of the trails have become old friends, to return to year after year after year. Just follow the dotted lines.

Lynne Geweke serves on the Conservancy board, is a long-time Conservancy member, and a retired doctor from the Midwest.



The whole family on the summit of Longs Peak, August, 1991



Rocky Mountain Conservancy

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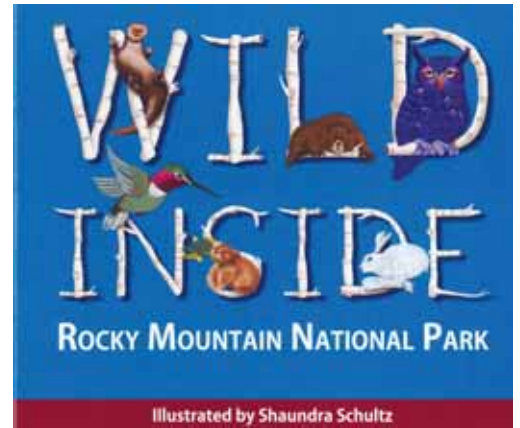
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Rocky Mountain Conservancy

Conservancy Donates Books For Kids to Local Nonprofit

The Conservancy has been proud to partner with the nonprofit Estes Valley Investment in Childhood Success organization (EVICS) to get 50 copies of our *Wild Inside RMNP* books to children and families in need right now. These books tell a wonderful story about the flora and fauna found in our beloved Rocky. Thanks to one of our wonderful members for making this gift possible with a donation. This is a great time to plant seeds and read! *Wild Inside* is available at our online Nature Store at RMConservancy.org.



Conservancy Nature Store in Allenspark Outlet Profile

Welcome to one of the Rocky Mountain Conservancy's newest partnership Nature Stores! The Old Gallery in Allenspark Colorado is home to one of the seven Rocky Mountain Conservancy Nature Stores where visitors and locals alike can find some of their favorite Rocky Mountain National Park items.

This unique multiuse building is located on Highway 7, at the edge of the town of Allenspark, just before the turn for the Peak to Peak Highway. It's a great spot for community gatherings, but as it turns out, also a lovely visitor information site. In addition to hosting the Nature Store, the gallery itself showcases a variety of local artists with pieces available to purchase.

The mission of The Old Gallery (TOG) is "to provide resources and opportunities to enrich lives in our mountain communities." TOG carries out their mission by providing



Retail Clerk Jeanne Zukowski models a selection of items to be found at The Old Gallery Nature Store in Allenspark.

special events, classes of various types, a Community Closet, a Community Cupboard Food Bank, and more. Their mission coincides seamlessly with the mission of the Rocky Mountain Conservancy to preserve Rocky Mountain National Park. This is a unique kind of stewardship that the Conservancy can get behind that also supports the local community. We look forward to many years of successful partnership in the years to come.

PARK PUZZLER SOLUTION



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Pop goes the weasel! A long-tailed weasel pops out for a quick look.

Photo: Dean Martinson



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Nature Notes

The joys of summer persist amidst the worst pandemic the modern world has seen to date. Elk are calving, bluebirds are flitting, cottontails are multiplying and golden banner has come and gone ☺ Former RMNA Executive Director **Curt Buchholtz** was hiking in Upper Beaver Meadows in early June and sat down to enjoy a cup of coffee and cinnamon roll on a log for a mid-morning break. As he slurped the hot liquid, over the edge of his cup he noticed some movement of something brown behind a large boulder. The generalized dark color soon differentiated into a large black bear that was headed straight for him. Instinctually, Curt greeted the bear, which caused the bear to move away as though it hadn't quite seen the person in its path. Interestingly, the bear was cinnamon colored, which made Curt ponder the possible connection to the roll in his hand. In case there was, he quickly packed up his nature cafe and moved on ☺ Quarterly Editor **Nancy Wilson** was walking in Carriage Hills in Estes Park and came upon an elk that had just delivered a calf in the shade of a huge ponderosa pine. Mama was licking the newborn calf as it almost immediately attempted to stand on its oh-so-wobbly legs. After a bit, the cow laid down and gradually expelled the afterbirth, looking none the worse for wear ☺ During May amphibian surveys near Sprague Lake, Park Biologist **Mary Kay Watry** spotted a nesting Canada goose, lots of red-wing blackbirds and most notably a cow elk chase a moose out of the willows to defend her foraging area. This was surprising behavior to her as she had assumed that the moose would be more dominate. Needless to say, she gave both animals a wide berth ☺ Last year, with Conservancy funding, the park resource division conducted a small pilot reintroduction of boreal toads near Sprague Lake. No reintroduced boreal toads have been observed as of yet, but the icing on the cake of that test was the confirmation that the site did not have the amphibian chytrid fungus. Currently, portions of six egg masses from Panhandle Creek, a Larimer county breeding site outside of the park, that were already collected by Colorado Parks and Wildlife Biologists are being reared in the Bellevue Watson Fish Hatchery in preparation for this year's reintroduction. She added that the team will continue to look for any sign of them throughout the summer ☺ RMNP Woodcrafter **Cory Johnson** (a.k.a. Wildlife Whisperer) observed a hummingbird building a nest, bringing cottonwood fluff to soften the interior, and scooting around in the fluff to shape it properly ☺ Conservancy Development Assistant **Victoria Johnson** had ringside seats at her home in Estes to watch a mountain bluebird aggressively chasing and dive-bombing a Wyoming ground squirrel in her yard ☺ On a bike ride up Trail Ridge Road in early June, **Victoria** and her son **Sage** spotted a pika scampering among the rocks at Rock Cut, and 10 bighorn sheep grazing nearby. She also noticed that the marmot hole in the middle of the road at Rock Cut had been filled in ☺ RMNP Planner **Sheri Fedorchak** and her husband former Chief of Interpretation, **Rich**, spotted a classical tropically colored male western tanager on the Black Canyon trail above MacGregor Ranch at the end of May ☺ Conservancy Retail Assistant **Sherry Caldwell** spotted a small-medium sized mountain lion moving through the bushes in the trees behind the RMNP volunteer office in early June ☺ Estes Park residents **Jane** and **Pete Princehorn** reported bluebirds nesting in a box

near their house in Estes Park — they can hear the nestlings squawking to be fed as soon as the parents approach. At one point Jane noticed the female taking long white things out of the nesting box and flying away with them, and she wondered what the bird was doing. Turns out the parents remove the nestling feces to keep the nest tidy ☺ Estes Park resident **Dean Martinson** was out working in his barn in Estes Park, moving some boxes and other larger items around when suddenly there was a commotion on the floor — a mother long-tailed weasel and her four youngsters were scrambling around on the floor of the barn, while the mother was calling the alert with the weasel's unique call to scoot out the door. After this moment of chaos, Dean captured a photo (above) of one of them peeking out of the nearby rocks ☺ Estes Park Resident Rebecca Detterline caught sight of a white-tailed ptarmigan transitioning to summer whites at Big Crystal Lake ☺ Conservancy Member **Marlene Borneman** was meeting a friend to hike in early June at about 6:30 a.m. when she stopped to watch some cow elk and calves. One cow seemed to have twin calves. What happened next was fascinating: the mom clearly wanted to cross the Big Thompson River (why does everything look greener on the other side?), and she took the plunge, leaving her twin calves on the other side. The water was running fast and high. The calves obviously have some anxiety about this, but one of the calves appeared to be considering it more than the other. The mom was calling out to them making a shrill noise. The more daring calf went in, swimming toward the other side, obviously struggling with the current. It made it! The mom and another elk helped it heave onto the bank of the river. Mom called out to the second calf with a weird call, but the calf is very hesitant. It finally went in, but the current swept it down and away — the mom ran fast to get it, and Marlene couldn't see either one for a moment. Finally, the calf gained its footing, and both got out of the water. Next thing she sees is the whole family safely across the river and running in the wind. <Whew!> Just another day for wildlife ☺ It's a crazy world out there, but Rocky is still waiting for you to come and visit when you can —when it's safe. Visit nps.gov/romo for reservation information today. Be well. ☺

