



Rocky Mountain Conservancy

QUARTERLY

Summer 2017

**IT'S TRUE. IT'S REAL.
NATIONAL PARKS NOT EXEMPT!**
by John Gunn

The official Rocky Mountain National Park website describes the effects of climate change in a way we all can understand.

To paraphrase: It's like getting a fever. If your body temperature goes up, you feel terrible.

So does Planet Earth.

Like it or not, whether you believe humans are part of the problem or you don't, the world is warming up. And now, America is the world's only major industrialized nation standing in defiance of the Paris Agreement, an international pact that brought the world together to slow climate change. Imagine a ledger sheet listing more than 190 names on one side representing the nations that remain committed to the pact. On the other side of the chart are just three: the United States, Nicaragua (which declined to join up because it believes the 2015 agreement is weak and non-binding) and Syria, a country with other pressing concerns.

President Trump's decision to withdraw from the agreement because of his stated beliefs that climate change is a hoax perpetrated by China and unfairly costly and bad for American business, flies in the face of public opinion.

Polls show that Americans overwhelmingly believe that global warming threatens our planet. When word got out that America might pull out of the Paris Agreement, executives at many major corporations joined prominent educators and state and local government officials in declaring that if this country departs, they

would continue the fight against climate change. When the federal government abandoned the Paris pact, these entities announced their intentions to continue reducing their carbon footprints – greenhouse gas emissions – as if this country still were seated at the Paris table.

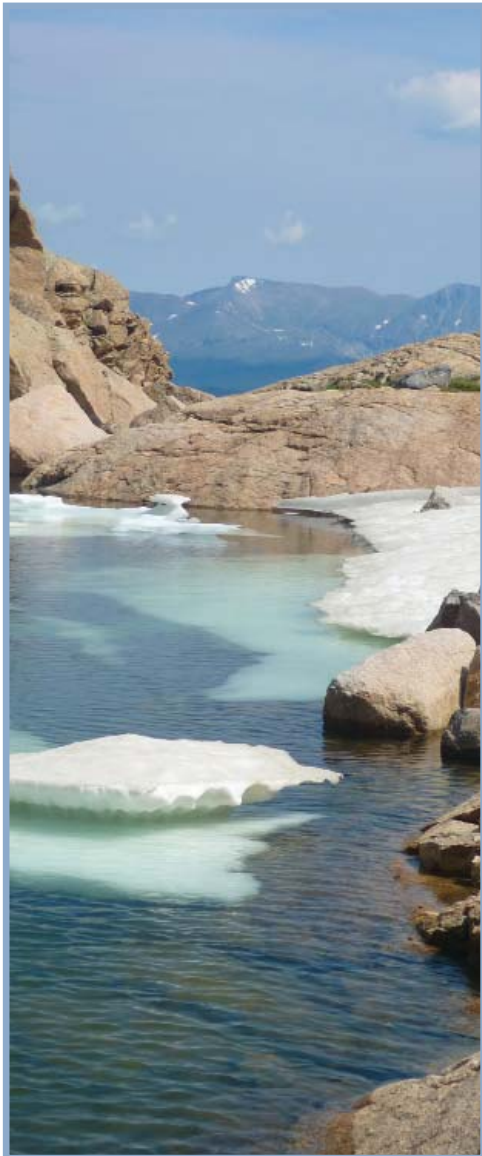
Executives for Exxon Mobil, Chevron, Shell and BP, companies in the business of selling fossil fuels, urged Trump not to opt out. Fossil fuels – coal, oil and natural gas – reportedly are responsible for almost three quarters of all human-caused emissions.

The signing of the agreement America has officially abandoned marked one of the few times in recent history that most of the world – including the U.S., Russia and China – joined in near-unanimous agreement. A few skeptics share the president's opinion that climate change is a hoax, but the facts and science disagree. Things are warming up, and the consequences could be catastrophic.

Planet-wide, from pole to pole, average surface temperatures already have warmed by as much as 1.5 degrees since the late 1800s, according to climate scientists. Government experts report that the first 16 years of the 21st century rank among the 17 warmest years on record.

Winters are shorter and milder. Summers arrive earlier, depart later and many days are hotter. Coral reefs are bleaching. Well documented is the melting ice near the North and South poles, the resulting rising seas and myriad negative impacts on plants and animals. Climate change is expected to strengthen hurricanes, typhoons and other storms. Flooding may

(Climate Change continued on page 2)



(Climate Change continued)

plague some parts of the world while other regions endure more frequent and severe droughts. Millions worldwide will suffer failed crops, food and water shortages, economic ramifications, political upheaval, refugee crises and more.

Closer to home, America's national parks already are witnessing climate change's impacts on some of this country's more iconic features. Glacier National Park's namesakes are melting, as are glaciers in other parks such as Mount Rainier, Olympic and North Cascades. Many of Alaska's mighty ice flows are receding and permafrost is melting. The rising seas threaten to overwhelm the Everglades' coastal mangroves and inundate much of the ecologically sensitive park.

Climate change is destroying the reproductive cycles of the Joshua trees that lent their name to the California national park, threatening their very existence. Milder winter temperatures also are inhibiting the cold-weather kill-off of insect pests such as the mountain pine beetle, which attacks tree species that provide food for Yellowstone's fabled grizzlies. National Park Service officials even fear that one of their most famous man-made landmarks, the Statue of Liberty, faces brutal beatings from rising seas and increasingly violent ocean storms.

Locally, many residents of the Rocky Mountain National Park area will tell you that the effects of climate change are palpable. The park's average annual temperature has risen an astonishing 3.4 degrees over the last century, according to climate experts. Winters always will be windy, but they're warmer. Years with below-average precipitation are more frequent. Snow melts and runs off earlier in the spring. Summer temperatures occasionally soar into 90s, even around 9,000 feet. Some early and late-season snows fall as rain, diminishing snow packs and altering the predictable availability of water supplies for plants, animals and humans.

The increasingly stressful mountain wildfire season arrives earlier and lingers longer. Fires are more prevalent and intense in the drier mountain forests and meadows. The planet's warming is believed to be bolstering the mountain pine beetle and spruce beetle infestations that have dramatically altered the park landscape. Climate change could leave Rocky Mountain National Park open to invasion by non-native plant species. Wildlife experts also fear for the future of a favorite high-country rock pile resident, the American pika, a tiny creature sensitive to even subtle changes in the climate.

America's national parks always will be beautiful places rich in natural and human history. But they will be different.

America's national parks always will be beautiful places rich in natural and human history. But they will be different.

Trump has given up America's seat at the Paris Agreement table, but this country remains in the climate change fight. The major corporations that have stepped up, the likes of Apple, Starbucks, Nike and Google, continue making reductions in their environmental footprints despite the Paris pullout. Business has learned that adjusting to the changing times is good for business and a boost to the corporate image. It's also the right thing to do, and they can use some help at the grassroots level.

Rocky Mountain National Park interpretation and education staff members and some park publications stress the contributions individuals can make to the fight against the warming climate. Young visitors are surprised to learn that simply turning off a light switch or conserving water while brushing their teeth can make a difference in the environment. Families

can make energy and resource conservation a part of the daily routine. And some of the ways it can be done are surprising.

Most people are aware that Americans cut greenhouse gas emissions by parking the car and hiking, biking, carpooling or taking the bus. But did they know that failing to eat all the food in the fridge fills landfills and sends climate-warming methane into the atmosphere as wasted food decomposes, according to an article published in the New York Times? (Better meal planning and smarter grocery shopping were a couple of solutions offered.) The newspaper also cited a Carnegie Mellon study suggesting families regularly replace red meat and dairy calories with fish, chicken and eggs. Red meat and dairy production operations release considerable amounts of methane. Fish and fowl production produces less.

Additionally, tried-and-true conservation methods deserve consideration. Consumers are urged to buy locally produced products offered by green companies. Recycle and reuse. Install LED lightbulbs that use less energy. Computers use energy even when they're asleep. Turn them off when they're not in use. Some energy experts extol the virtues of programmable thermostats that control household temperatures when residents are home, away and asleep. Some also urge purchases of Energy Star-certified appliances that use less electricity or gas. Maybe install a home solar electric system? It's always nice to plant a tree.

There are no guarantees. But people in the know tell us we might prevail if we collectively and individually rejoin the world in doing all we can to starve the atmospheric fever that threatens the planet's way of life. Public lands will certainly be the beneficiaries of our best efforts.

John Gunn is a writer/publisher and former reporter who worked as publications manager for the Rocky Mountain Nature Conservancy back in the day. He lives near Nederland, Colorado.



Photo: Marlene Borneman

Announcing the Annual Rocky Mountain Conservancy *Picnic in the Park!*



When: August 5, 2017
Time: 11:00 a.m. to 2:00 p.m.
Where: **Hidden Valley in RMNP!**
Members \$20.00; Guests \$25.00
Kids 6 – 12 \$5
Kids 5 and under free!

11:00 – 12:15 Activities & mingling
12:15 – 1:00 BBQ picnic lunch
1:00 – 2:00 Program

Check out this year's lineup of food and frivolity!

- Special guests
- Live music with local folk artist Brad Fitch
- Tasty cold beer from New Belgium Brewery
- Decadent fudge courtesy of Gateway Stores
- BBQ from KT's Barbeque in Boulder
(with vegetarian options)
- A 20% discount at our on-site Nature Store

RSVP by July 21 if you plan to attend

(Please note: reservations will close if capacity is reached)

Make your reservation by calling 970-586-0108

or at **RMConservancy.org**

- Advance payment is required — thank you!
- If you need to cancel your reservation, let us know!
- **Parking at the Gateway Store at the Fall River Entrance with shuttle to the site is STRONGLY encouraged** — visit the website for details about parking and the shuttle service to Hidden Valley:

RMConservancy.org

Thanks to George Carle of the Gateway Store!

We hope to see you there!

Cover photo credits

(Upper): "Yellow-rumped warbler" by Jim Ward, Estes Park, CO; (Lower) "Frozen Lake Views" by Nancy Wilson, Estes Park, CO.

Please send high-resolution images to nancy.wilson@RMConservancy.org by September 1 for publication in the 2017 Autumn Quarterly.

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

How do Canada geese communicate their destination to other geese members in their flock? What happens if one needs to drop out of the formation for some reason? Will the flock move in tandem or allow members to act independently as needed? If so, can it find its flock again? Communication in the Canada goose occurs by what's termed social learning — think "institutional memory." Banding studies have shown that flocks of Canada geese (and other waterfowl species such as sandhill cranes) have used the same general migratory paths and the same stopover locations for many generations, indicating an ability to remember landscape features. Migrating flocks typically are aggregations of family groups originating in the same vicinity, containing older members with memory and knowledge gained from previous migrations and novices making the journey for the first time. Information is passed from one generation to the next, then, as these novices gain their knowledge by "following the leaders." (As a sidenote, the lead goose in the V-formation is not always the same — they switch off that
(Geese continued on page 13)

In the past, maybe 30 – 40 years ago, it was common to see evidence of porcupine activity in the park — quills, treetop chews, roadkills, etc. It's been years since I've seen any porcupine activity. What is the status of their population, and is anyone doing research on porcupines in the park? I used to see porcupines in the late 80s and early 90s in the park, and I, too have noticed a reduction in porcupine sign in my treks in the park over the years. I attribute this possibly to the loss of lodgepole, ponderosa and spruce from the outbreaks of mountain pine beetle and spruce beetle. I know that coyotes, puma and fishers prey on the porcupine, which are also a variable, as are parasites and disease, such as tularemia, which was present about a decade ago in the park. — *Retired Resources Management Specialist Jeff Connor. Per Gary Miller, retired RMNP Wildlife Biologist: I've noticed the same, not just in Rocky but elsewhere in our forested mountains since the 1970s. Anecdotally, however, I've seen them more (Porcupines continued on page 13)*

Are there more mule deer in the park these last couple of years? If so, why? The short answer is yes. While the park does not actively track mule deer population numbers, from previous research we recognize that deer readily move across park boundaries. As such, Colorado Parks and Wildlife (CPW) does include Rocky's deer populations in its inventory, as part of the Big Thompson deer herd. In this herd, there has been an increase in the overall herd size since 2006, most likely due to favorable spring and summer moisture conditions as well as to a reduction of hunter harvesting. Prior to the fall of 2013, the Big Thompson deer herd area (Game Management Unit 20) was in a (approximate) 10-year drought. Since the spring of 2014, "more normal" spring and summer moisture regimes have resulted in an increase in fawn production. In addition, CPW has started to move away from a suppression-based management strategy of the herd, which began during the initial chronic wasting disease outbreak of the early 2000s. The herd management plan is, once again, up for renewal, but looking into the crystal ball at this point, it is likely that the deer herd will be maintained at current levels, or possibly increased somewhat, keeping in mind that chronic wasting disease always complicates things. — *Colorado Parks and Wildlife Biologist Ben Kraft*

Trends in the Seasonal Snowpack of Rocky Mountain National Park

by Glenn G. Patterson, Ph.D.



Figure 1. The seasonal snowpack in Rocky Mountain National Park

Photo: Glenn Patterson

One of the signature aspects of Rocky Mountain National Park is its snow-covered peaks. Blanketing the entire park in winter, the seasonal snowpack gradually melts during late spring and summer to reveal perennial snow and ice in protected areas on the high peaks during late summer and early fall (Figure 1).

The year-to-year variability in the seasonal snowpack is the source of much prognostication as the snow accumulates: “Will there be good snow for snowshoeing and cross-country skiing, and how long will it last?” “When will Trail Ridge Road open, and when will it close?” As the melt season begins in late spring, the questions reflect the snowpack’s critical role as “nature’s water tower” (Viviroli et al., 2007): “Will there be enough water for the crops?” “When will stream flows be good for the fish?” “Will the fire danger be extreme this summer?” The seasonal snowpack is important for all of these reasons and more. Snow also protects plants from the cold dry winter winds, and provides protection and habitat for many of the park’s animals (Figure 2).

Looking toward the longer term, questions about snow address the trends that smoothen out the year-to-year variability for a longer perspective: “Is there as much snow as there used to be?” “What is the future likely to bring for Rocky’s seasonal snowpack?”

This article addresses these questions, especially over the long term, using some findings from a 2016 Colorado State University doctoral dissertation supported, in part, by the Continental Divide Science and Learning Center of Rocky Mountain National Park (Patterson, 2016).

Measuring Snow

To help answer questions about the amount of snow accumulating and snowmelt expected in a given year, two types of snow monitoring stations were established in Rocky Mountain National Park and elsewhere in the mountains of the western U.S. Starting in the 1930s, the U.S. Natural Resources Conservation Service (NRCS) established snow courses, at which



Figure 2. Some of the animals that rely on seasonal snow for habitat and protection: snowshoe hare (Putney Nature Images); long-tailed weasel (Debbie Mason); ptarmigan (Marlene Borneman); pika (Dick Orleans)

two types of manual measurements are made at the first of each month during the heart of the snow season. At these courses, an established line is set over relevant terrain to measure snow qualities.

The first measurement is snow depth. Because the snow density varies, it is also important to measure snow-water equivalent (SWE), which is the amount of frozen water contained in the snowpack. SWE is measured by weighing a sample of the snowpack.

The second type of snow monitoring station, established in the late 1970s by the NRCS, is the Snowpack Telemetry, or SNOTEL, station. These stations use automated sensors to continuously measure snow depth, SWE, precipitation and temperature (Figure 3). This study used data from 23 snow courses, nine in Rocky Mountain National Park and 14 nearby, and from 13 SNOTELs, five in the park and eight nearby.

Short- and Long-Term Variations

Year-to-year variations in the weather cause large fluctuations in the snowpack from one year to the next. The year 2011 brought a very deep and persistent snowpack that was followed in 2012 by a thin and early-melting one. At the Lake Irene SNOTEL, just west of the Divide along Trail Ridge Road, in 2011 SWE reached its peak of 1,146 mm (45.1 inches of water) on May 4, with a snow depth of 3.1 m (10.1 feet). At the same site in 2012, SWE reached its peak of 371 mm (14.6 inches) on March 11, with a snow depth of 1.5 m (59 inches). The difference was related to differences in precipitation during the two years.

These short-term, year-to-year variations, however, do not represent long-term trends. The long-term trends become evident using statistical tests that average the year-to-year variations to reveal trends that prevail over periods of several decades. Such trend analyses often focus on April 1 SWE, the first-of-month reading that typically falls closest to the annual peak SWE at many sites.

Analyses of April 1 SWE at a typical snow course (Hidden Valley) for the period 1941 – 2015, showed a declining trend of about 17 mm (0.67 inch) per decade. At a typical SNOTEL (Lake Irene) for the period 1981 – 2015, the declining trend was about 31 mm (1.2 inches) per decade (Figure 4). These are similar to trends reported for declining snowpack in other parts of Colorado and the western U.S. (Mote et al., 2005). If



Figure 3. A snow course (left) and a SNOTEL monitoring station (right) Photos: Glenn Patterson



these trends were to continue for a century to a century and a half, there would then be many years with zero snow on the ground on April 1.

SWE Trends for Different Months

Long-term trends of SWE in and near the park are actually more complicated — and interesting — than what’s shown in the April 1 SWE graph shown be;pw. Figure 5 shows results of similar trend analyses, averaged over all 13 SNOTELs, for month-end SWE, and for change in SWE during the month, for different months during the snow season, during the period 1981 – 2015. The snow season is depicted by the orange curve in this graph, which represents the average SWE in the snowpack for each month.

It turns out that November, December, March and April show decreasing trends in SWE, while January, February and May, surprisingly, show increasing trends (purple bars in Figure 5). Monthly trends in snowfall (SFE) at the SNOTEL stations (orange

bars) and in temperature at nearby weather stations (green bars) help to explain these differing monthly SWE trends. November and March show trends toward warming and drying. Since these are months when the temperature hovers close to freezing, these trends toward warming and drying lead to less snow accumulation and more melt as time goes on. Additionally, the warming trends during these months are likely to be self-reinforcing. More melt means more bare ground, which absorbs the sun’s heat better than the reflective surface of snow.

The situation is different during other months. December, January, February, April and May actually show trends toward greater snowfall with time, and four of these months, all but January, show cooling trends. The slight warming trend during cold January is not sufficient to cause an increase in melt, so the net effect during all five of these months is a trend toward an increasing positive

change in SWE, i.e. more snow during these months. This means that in Rocky Mountain National Park, the trend over the past 35 years has been toward a cooler, snowier core of the snow season, with warmer, dryer conditions during the shoulder months of November and March. The trend toward cooling and more snow in April and May is surprising, and is not generally seen in similar studies elsewhere, but may reflect an increase in weather conditions that bring spring snowstorms to the Front Range.

The Future

Climate models have been gaining in sophistication in recent years, and probably provide more accurate projections of future SWE trends than simply projecting current trends into the future. Nearly all of these models project that temperatures will rise in the future, eventually overcoming the cooling trends mentioned

above for certain winter months.

The models show less agreement when it comes to precipitation. One climate model, WRF-Hydro, developed specifically for this area (Rasmussen et al., 2014), offers in its projections some consistency with the observed trends in SWE. For the elevations in this study area, over the next 50 years, this model projects little change in SWE between October and January. Between January and March, thanks to increasing precipitation, it projects a slightly increasing trend in SWE. This increasing trend would probably continue until temperatures warm to near-freezing in mid-winter at these elevations. This would take several centuries according to the observed temperature trends and the model projections.

For April and later, the model projects decreasing SWE trends at rates comparable to those observed in this study, at around 13 to 25 mm (0.5 to 1 inch) per decade. If this trend were to continue for several centuries, it would then be common to have bare ground on April 1 in what is now the snow zone.

To summarize, over the last 35 years the snowpack has been increasing during the coldest months, December through February, and also increasing during late spring. During November and March the snowpack has been decreasing. Over the

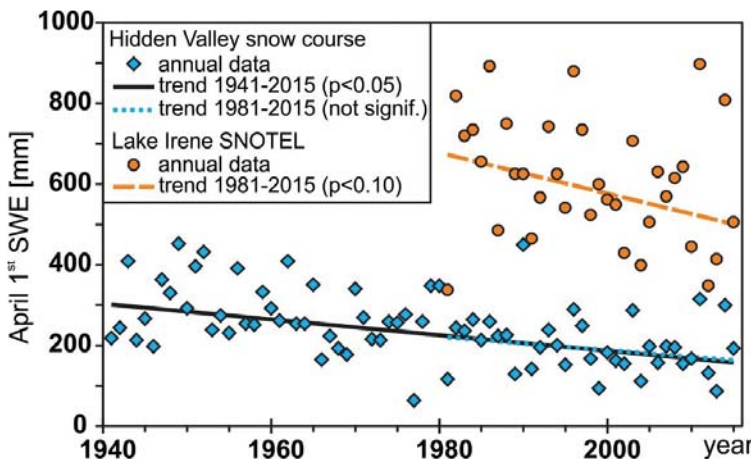


Figure 4. Example plot of annual series of April 1 SWE for a snow course and a SNOTEL station, showing year-to-year and long-term variability. Lines are linear best-fit trend lines.

(Snow continued on page 7)



Adventure Tours

The Field Institute offers weekly scheduled bus tours in the park in a 14-passenger minibus.

Sunset Safari is a tour up Trail Ridge Road to enjoy the changing evening light at Rock Cut.

Grand Lake Safari takes participants on a daylong trip over Trail Ridge Road to the west side of the park.

Old Fall River Road is a historic tour of the park's oldest road.

Journey to the Top! brings passengers to the top of Trail Ridge Road to experience the changing life zones and the vast alpine tundra.

New! From Meadow to Treeline takes the morning to explore the cultural and natural history of the lower elevations in Rocky Mountain National Park — with stops including Many Parks Curve, the Alluvial Fan and Moraine Park.

New! Flora and Fauna Classes

Flower Families – Plant & Wildflower Identification with a Naturalist explores new flower families in the park.

Using a Dichotomous Key delves into decoding dichotomous keys with a seasoned naturalist to stretch skills and build confidence with keying plants and wildflowers in Rocky.

Predator Prey studies predator/prey dynamics and teaches participants to read signs left behind by wildlife.

Alpine Superheroes examines the diversity of plants and animals that survive and thrive in the difficult alpine setting.

New! Art and Photography Offerings

Painting the Kawuneeche: Advanced Watercolor in Grand Lake will hone basic skills and strive for accuracy and speed through this two-day plein-air watercolor experience.

Night Sky Landscape Photography is a two-day advanced class to learn to photograph the Milky Way, the moon, the stars and other objects in the night sky.

Campfire Ghost Stories – New characters!

Featuring living history tales of the west, both kids and adults will enjoy hearing past tales of humor, exploration, and danger come to life while roasting marshmallows over the fire.

Rocky Mountain Conservancy – Field Institute Educational Adventures in the Park!

In Rocky Mountain National Park, the summer season is well on its way and the Rocky Mountain Conservancy Field Institute's summer classes and events are in full swing. This season, the Field Institute introduces new tours, kids' events and adult classes for an exciting summer exploring Rocky Mountain National Park!

New! Natural and Cultural History Courses

Historic People & Places Centennial Tour studies the history of the town of Estes Park, the Estes Valley, and Rocky Mountain National Park.

Kawuneeche Valley History examines the region's past through exploration of sites like an ancient Indian battlefield, mining towns and early homesteads.

Ghost of Fall River Road retraces the history of the road from Horseshoe Park to Milner Pass.

Geology in the Park explores the fascinating geology of Rocky Mountain National Park.

What's Going to Happen to Our Park? explores how vulnerable nature is to a shifting climate.

RMNP Algal Blooms in the Alpine investigates the role of global change on mountain lakes with a park researcher.

Vanishing Ice examines the Ice Age glacial and periglacial features of Rocky Mountain National Park.

New! Classes for Kids

Cloudy with a Chance of Graupel? explores the mystery of weather in the Rocky Mountains.

Geology Rocks! is a geologic adventure taking kids through hundreds of different kinds of rocks scattered throughout the landscape.

Plants for Young Sprouts is a hands-on, exploration-based program in which kids connect with plants in the park.

Rocky Mountain History Hike is a naturalist-guided hike to the once-active Eugenia mine, where kids will dive in and learn about the gold rush, homesteading, and other history that shaped the area.

New! Guided Hikes

Boulder Brook Loop traverses the Glacier Gorge, North Longs Peak, Boulder Brook and Glacier Creek Trails in Rocky Mountain National Park.

For a complete list of classes, or to register, call (970)-586-3262, or go online to: RMConservancy.org and click on the 'Learn With Us' tab.

(Snow continued from page 5)

next few decades these trends are likely to continue, with more loss of snowpack in the spring. And by the end of the century it is likely that, in some years, we will see little to no snow on April 1 in areas that now have dependable snow on that date.

(Article references can be obtained by request through the RM Conservancy.)

Glenn Patterson is a hydrologist who studied at the Universities of Chicago and Arizona, and recently at Colorado State, where he studied snow hydrology under Stephen Fassnacht. Glenn worked for the U.S. Geological Survey for 30 years. He and his wife Margie live in Allenspark where they enjoy hiking in the summer and — what else? — snow sports in the winter.

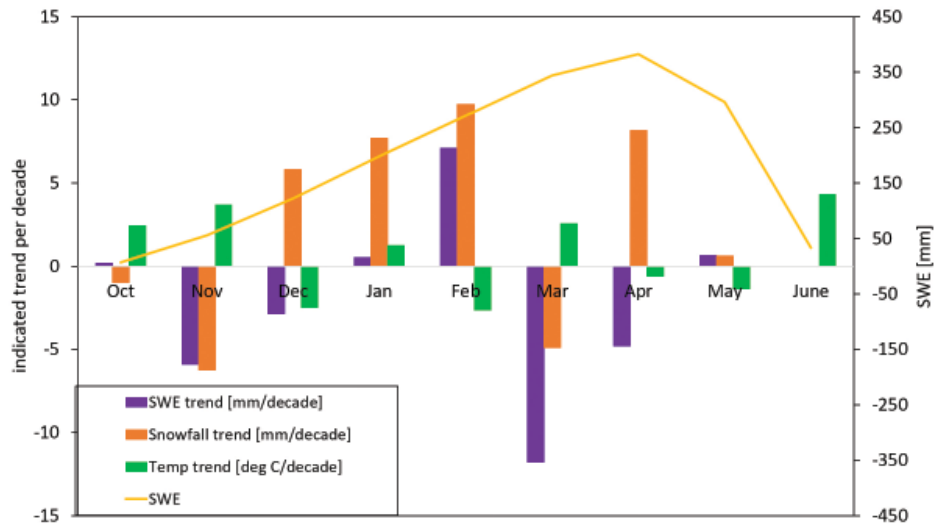


Figure 5. Average trends in SWE, monthly change in SWE, snowfall (SFE), and temperature, by month

Park Puzzler

by RM Conservancy Member Joel Kaplow

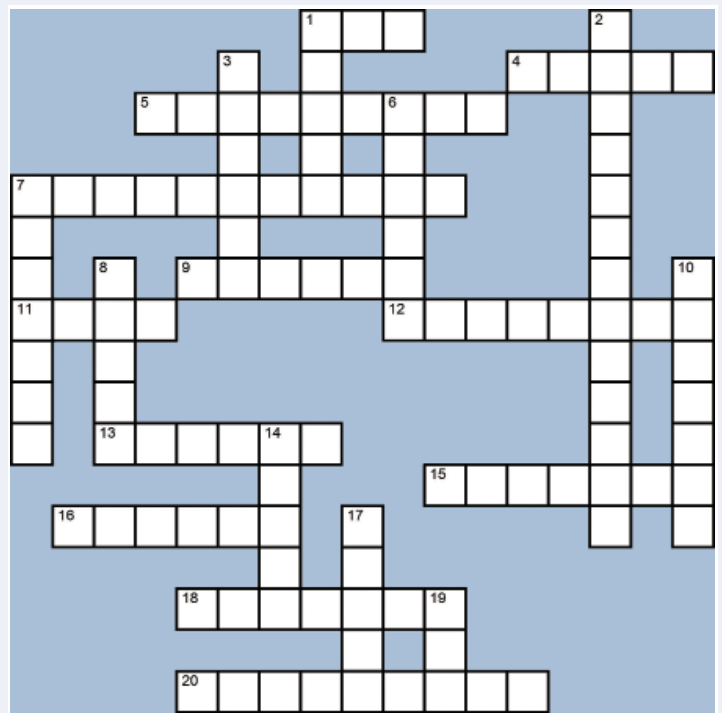
Across

- Before Longs Peak and Mt. Meeker were officially named, imaginative French fur trappers referred to them as Les Deux Oreilles; The ___ Ears.
- Rocky’s bighorn rams will butt heads while competing for the ladies. With each ram going at a 20-mile-per-hour clip, it’s a good thing their skulls are two layers thick and reinforced with struts -- they have built-in ___ absorbers!
- Borrowing the name of a national parks pass program, the National Mint implemented its America the ___ Quarters Program in 2010. On the reverse (back) sides, sites of national interest are depicted, such as national parks.
- Since 2009, when most of Rocky was designated as wilderness, it has been transitioning to embrace this new status in its culture. For example, you now go to the Wilderness Office for a wilderness permit instead of the now-passé ___ Office and permit.
- The park’s Mummy Range is a subrange of the Front Range, which itself is a subrange of the Rocky Mountains. Oddly, the tallest peak in the Mummies is not Mummy Mountain, but ___ Peak, which was named for a surveyor who is said to have climbed it in 1871.
- On Rocky’s west side, you will find the appropriately named ___ Meadows, located about two miles north of the appropriately named Big Meadows.
- Big Meadows is bisected longitudinally by ___ Creek.
- The world record for the 100 meter dash was set by Jamaica’s Usain Bolt, who was clocked at 27.8 miles per hour in 2009. But he would’ve had to settle for a silver medal if a bighorn sheep were in the next lane. Bighorns can sprint up to ___ miles per hour.
- Israel Rowe discovered what is now RMNP’s Gem Lake. In the Mummy Range, you will see a peak, a mountain and a ___ named for him just north of 9-Across.
- The newest rocks in the park are mere youngsters, geologically speaking, at about 23 million years old. They were formed by volcanism, and are found in the Never ___ Range on the park’s western edge.
- Due to the gouging of several glacial episodes, Grand Lake on RMNP’s west side is Colorado’s largest and ___ natural body of water.
- Rocky didn’t make it into the quarters set mentioned in 5-Across, as it did for the 50 State Quarters Program, but Colorado’s Great ___ National Park did. (2 wds)

Down

- Interestingly, the oldest known rocks in the national park system are found in the country’s youngest mountain range in Grand ___ National Park. They’re looking good at 2.5 billion years old!
- Ovis canadensis*, aka bighorn sheep, includes three subspecies: *Ovis canadensis sierrae*, aka Sierra Nevada bighorn; *Ovis canadensis nelsoni*, aka desert bighorn; and the park’s *Ovis canadensis canadensis*, aka ___ bighorn. (2 wds)

- The U.S. Mint began the 50 State Quarters Program in 1999. The Colorado quarter appeared in 2006, with Longs Peak gracing its reverse side, along with ___ Mountain, and the connecting ridge known as Keyboard of the Winds.
- The Big Thompson River’s headwaters arise in ___ Canyon, just southwest of Rocky’s Alpine Visitor Center.
- The oldest rocks known in RMNP can be seen at different locations within the park, such as Mt. Meeker, and are about 1.7 ___ years old.
- Grand Lake is fed by two main streams: North ___ and East ___, with both blanks having the same entry.
- In RMNP’s northeast section is found ___ Ridge, which roughly parallels the North Fork of the Big Thompson River for about four miles.
- If you are standing in the middle of the town of Grand Lake, you can travel in ___ different cardinal directions and end up in RMNP.
- Rocky Mountain Conservancy’s ___ Institute program provides hands-on and boots-on educational adventures in Rocky, including everything from hikes to history.
- A bighorn’s horns never stop growing — hence the “big.” An oldster ram’s set of horns can comprise as much as ___ percent of his total body weight!



Rocky Addresses Challenges Tied to Dramatic Increase in Visitation

by Kyle Patterson,
RMNP Information
Officer

Over the last 100 years, the reasons people visit Rocky Mountain National Park are the same; to experience nature, to seek solitude, to enjoy scenic grandeur, to watch wildlife, and to partake in outstanding recreational activities. In 2016, Rocky Mountain National Park was the fourth-most-visited national park with more than 4.5 million visitors. This visitation represents a 32% increase since 2014, and a 40% increase since 2012. In fact, every month in 2016 set visitation records on the east side of the park.

In 2002, a transportation study report projected that visitation in Rocky Mountain National Park would exceed 4 million by 2010. For numerous reasons, which related primarily to the economy, this did not happen. And between 2002 and 2012, visitation remained largely static, hovering at about 3.1 million people. In 2013, however, the park began to see significant increases in visitation. This dramatic shift in just three years has presented significant challenges related to visitor and staff safety, operational capacity, resource protection and visitor experience.

Since the 2002 projection of an increase of visitors, the park has addressed several significant issues that have buffered the immediate effects of the rise in visitation, including an investment of more than \$66 million



High park visitation has significant impact on wildlife during different seasons.

Photo: Jim Ward

Federal Lands Highway Program funds into the park's road system. Since 1996, more than \$75 million from park entrance and campground fees have been used toward deferred maintenance, and resource and operational projects in the park. Funds provided by our partner, the Rocky Mountain Conservancy, also have helped considerably with improving park trails at Alberta Falls, Lake Haiyaha, Lily Lake and Coyote Valley areas, and providing support to the park's education program to enhance visitors' experience.

This 'new norm' of visitation appears to be most immediately caused by low gasoline prices, as travel to numerous national parks throughout the re-

gion has increased substantially. Rocky's visitation has consistently been largely influenced by local and regional repeat visitation. The substantial and recent growth of population along the Front Range of Colorado (among top 10 growing states with 85% of population on the Front Range) suggests that even when gasoline prices rise, visitation will continue to be

high. The park's centennial celebration in 2015 and the National Park Service centennial in 2016, likely also added to the increase.

Many people are moving to Colorado because of their love of recreational opportunities and the draw of the mountains. They also are interested in visiting and enjoying their national parks. That's a good thing! The Nation-



Rocky is a much-loved park, and traffic can be fierce in the summer. Plan ahead!

Photo: NPS

al Park Service recognizes the singular right of everyone to experience their national parks. On the flip side, however, this principle presents significant challenges that many national parks are not prepared to handle.

At Rocky, for example, employee

morale and fatigue rise to the forefront of pressing issues as operational capacity is revealed to be out of alignment with visitation. Additionally, visitor and staff safety have been compromised through frequent traffic congestion issues and increased crime.

While most people are familiar with expected visitor behavior while enjoying the national parks, some are not, and in the last few years, park staff has reported a rise in a host of challenging conduct by some visitors, including approaching wildlife, illegal parking, illegal camping and an increase of dogs on trails. Interestingly, illegal campfires have more than doubled in the last three years.

In 2012, the Fern Lake Fire was caused by an illegal campfire, resulting in evacuations, loss of a private residential structure, and a cost of more than \$6 million. Backcountry and front country natural and cultural resources also are seeing significantly increasing impact, such as an increase and distribution of human waste, property damage and vandalism, as well as an increase in destructive social trails.

As an initial response to the surge in visitation, during the summer and early fall of 2016, park staff restricted vehicle access in three specific areas when parking areas filled and heavy congestion warranted it: the Bear Lake Road corridor, the Wild Basin area, and Alpine Visitor Center. This occurred most weekends from late June through September of 2016, and park staff will continue to implement these short-term efforts in 2017.

To set the foundation for a long-term visitor-use management planning effort, the park's leadership team engaged our local communities beginning in January of 2016. In addition to interviews with the media, park staff met with county commissioners,

town boards and leaders to provide foundational information for what will be a multi-year conversation and planning process. A park visitor-use management team also was formed that consisted of park employees from different divisions to address both the

short- and long-term issues and action items tied to this significant increase of visitation.

A number of other National Park Service sites, including Zion National Park, Acadia National Park, Arches National Park, Muir Woods National Monument, and Haleakala National Park, are embarking on visitor-use management plans, transportation plans or site-specific reservation systems.

Park staff continues to emphasize to visitors the importance of planning ahead to enhance the experience. Popularity and high visitation during the summer and fall, particularly during 10 a.m. to 3 p.m., can mean full parking lots, congested roads, busy trails, and long lines and wait times at entrance stations.

Addressing day use for the long term is just beginning and will require a thoughtful and stakeholder-engaged planning process. There will be numerous opportunities for public and stakeholder engagement.

As we look forward to the next 100 years at Rocky Mountain National Park, it will be more crucial than ever to work together to accomplish the mission of the National Park Service; to conserve the scenery and the natural and historic objects and the wild life therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for future generations.

The substantial and recent growth of population along the Front Range of Colorado (among top 10 growing states with 85% of population on the Front Range) suggests that even when gasoline prices rise, visitation will continue to be high.

Be prepared to be strategic when you visit the park this summer!

- Hike early or hike late (prior to 9 a.m. or after 4 p.m.).
- Check the weather forecast to better plan your day and destinations. Particularly if planning to hike later in the day, it is critical to know the weather forecast for the elevation of your destination.
- Carpool
- Take advantage of the park shuttle.
- Trailhead parking lots fill early in the day:
 - Glacier Gorge Trailhead by 6:00 a.m.
 - Bear Lake Trailhead by 8:30 a.m.
 - Park and Ride by 10:30 a.m.
 - Wild Basin Corridor by 9:30 a.m.
- If you want to hike in the Bear Lake Road corridor and plan to arrive after 11, your best option, and on some days your only option, will be to take the Hiker Shuttle from the Estes Park Visitor Center.
- The Alpine Visitor Center parking lot is busy between 10 a.m. to 3 p.m.
- More than eighty percent of park visitors arrive through the east entrances of the park.
- Camping is popular in the park. Reserve a campsite up to six months before your visit. The two first-come, first-served campgrounds fill up quickly. Timber Creek Campground, located on the west side of the park, fills up last.
- In September, visitation is 50% higher on weekends than weekdays.
- Purchase a daily or weekly entrance pass online at go.nps.gov/rockyfees. Your email confirmation will serve as your pass and should save transaction time once you reach the park entrance station kiosk.



The 2017 RMNP Research Conference was held on March 1 – 2 at the Estes Park Municipal Building. Special thanks to the Town of Estes Park for use of the Municipal Building and to the Rocky Mountain Conservancy for supporting the event.

by Carissa Turner

Rocky Mountain National Park (RMNP) held its biennial Research Conference March 1 – 2 this year, in Estes Park, CO. This year's theme was People and Stewardship: Using Research for Management, recognizing that people are key to the long-term stewardship of RMNP's natural and cultural resources. Conference sessions were held on Ecological Restoration; Climate Change; Environmental Contaminants and Public Health; Wildlife; Youth, Relevancy, and Public Engagement; and Visitor Use. The two-day event was a great opportunity for park and academic researchers to share their work and findings with each other, park staff and the public. Park staff also highlighted how research was being used to guide management at RMNP. The conference was organized by the Continental Divide Research Learning Center, with the support of RMNP's Interpretation and Education Division. The Rocky Mountain Conservancy was a key supporter of the conference.

People are the Key to Park Stewardship

People from all walks of life play a critical role supporting the National Park Service mission of resource preservation. During the conference Welcome session, Therese Johnson, Director of RMNP's Continental Divide Research Learning Center, praised the role that conference attendees play in the stewardship of RMNP, "Whether you are an interested citizen, community member, park visitor, citizen scientist, long-term partner, new

collaborator, research scientist, or a paid or volunteer member of the park staff, you are an important link in the stewardship of the park resources that we treasure."

In recognition of the important role that partners and citizens play in RMNP's resource preservation, the park presented several awards during the Welcome session. Dr. Tom Hobbs, who also gave the keynote address, was presented with the Stewardship Award for his substantial research in elk ecology and contributions to the development of RMNP's Elk and Vegetation Management Plan. Rich Bray and Stephanie Mason were presented with the Citizen Science Award for their development and leadership of the Rocky Mountain Butterfly Project, a citizen-driven inventory and monitoring project



Dr. Tom Hobbs' 40 years of research at RMNP has contributed significantly to elk population management, one of the most critical issues the park has faced. In recognition of his great work, Dr. Hobbs was presented with RMNP's 2017 Stewardship Award by Superintendent Darla Sidles and Acting Chief of Resource Stewardship John Mack. Photo: NPS/Ann Schonlau

2017 RMNP Research Conference Highlights Importance of Research in the Park

started in 1995. The Rocky Mountain Inventory and Monitoring Network received the Partnership Award, new this year, for their outstanding contributions and commitment to improving the park's understanding of its resources.

In his keynote address, Dr. Hobbs stressed the importance of engaging all stakeholders in discussions about resource management. "The need for diverse participation arises because most decisions that matter are shaped by facts and by values." Using examples from his work at RMNP, Yellowstone National Park, and in Sweden, Dr. Hobbs illustrated the need to support citizen understanding of the problems and solutions, recognize conflicting perspectives on the issues, and incorporate both science and stakeholder values in the development of management alternatives.

Parks Need Science

The climate is changing, visitation is up, and intensive efforts are needed to restore natural landscapes around RMNP. Now more than ever, parks are relying on science to help preserve resources while providing quality experiences for visitors. Thanks to the support and dedication of agency, academic and community partners, and the public, RMNP is able to understand and address impacts and emerging issues in the park. The 2017 Research Conference highlighted several topics and projects for which research provides the basis for management-related action in climate mitigation, ecosystem restoration and visitor-use management.

Climate change and its impact are evident throughout RMNP. Climate change-related research was presented on a range of topics, including archaeolo-



Conversation Cafés gave conference attendees an opportunity to discuss and explore some of RMNP's hot topics: visitor use, climate change, wilderness, relevancy, ecological services, and wildlife management. Photo: NPS/Carissa Turner

gy, paleolimnology and forest change. The session concluded with a panel discussion during which RMNP staff highlighted park actions related to climate change. Paul McLaughlin (Wilderness Coordinator), Danny Basch (Facility Manager) and Kyle Patterson (Public Information Officer) briefly presented on climate-related impact on the park, park-wide mitigation projects and successes, and external communication on climate change, followed by a question and answer session.

Managing for increasing visitor use is a hot topic throughout the National Park Service, as many parks have experienced peak visitation in the last few years. RMNP is no exception, and this year's conference dedicated a session to visitor use-related research in the park. An overview of visitor-use trends at RMNP kicked off the session, followed by presentations on the history of human use on Longs Peak, visitor use and behavior along the Longs Peak and Twin Sisters trails, and resource impact monitoring of bouldering (a relatively new type of use) in the Bear Lake Road corridor. The session ended with presentations by two of RMNP's Climbing Rangers, Mike Lukens and Kevin Sturmer. Sturmer discussed a new monitoring and outreach program that targets bouldering in Chaos Canyon. Lukens described



RMNP Superintendent, Darla Sidles, and Acting Chief of Resource Stewardship, John Mack, present the 2017 RMNP Partner Award to the Rocky Mountain Inventory and Monitoring Network (ROMN). The ROMN established a foundational inventory and monitoring program to understand current ecological conditions and evaluate long-term ecosystem health of RMNP. Photo: NPS/Ann Schonlau



Presentation: Kristen Kaczynski presented on large-scale willow restoration in Moraine Park during the Ecosystem Restoration: Wetlands and Rivers session. Photo: NPS/Ann Schonlau

the park's successful preventative search and rescue (PSAR) program. Both of these programs were enhanced due to research findings.

Ecosystem Restoration: A Grand Ditch

Breach session also explored research as a tool to inform management action. Presentations on the slope stabilization at the site of the breach, phase one of the Lulu City wetland restoration, and river alignment monitoring of the upper Colorado River, set the stage for a final presentation by Acting Chief of Resource Stewardship John Mack, on the second phase of the project which will be starting this summer. This final presentation highlighted the extensive partnerships that support this project and the importance of the adaptive management process that has been implemented at all stages of this restoration effort.

Looking Ahead to the Next Generation of Park Stewards

The future of resource stewardship on our public lands, including the National Park Service and RMNP, requires interest and advocacy from the diverse American population, particularly the next generation of citizens and park visitors. This year's conference session on Youth, Relevancy and Public Engagement, was engaging and entertaining. Presentations

on citizen science at RMNP and youth perceptions and experiences on public lands gave insight into opportunities for public and youth engagement at RMNP. Students from Thomas Jefferson Middle School in Denver, CO, and St. Vrain STEM Academy in Longmont, CO, gave moving presentations about the citizen science work that their classes are doing in RMNP, and the value that these opportunities have on their education and appreciation of the park. To further support and encourage collaboration between researchers and education, the conference also hosted an evening event, Take It Outside: Adding Value to Science Education through Active Park Research. This event provided a wonderful opportunity for researchers and educators to meet and find common ground between ongoing park research and education goals, in the hopes of inspiring the next generation of RMNP stewards.



Rich Bray (left, with Eric Raun) and Stephanie Mason (right) received the 2017 Citizen Science Award for their work in developing and leading the Rocky Mountain Butterfly Project. During the past 22 years, they have engaged more than 50 additional volunteer citizen scientists. The project totals more than 38,000 volunteer hours, with Rich contributing over 17,000 hours and Stephanie contributing nearly 5,000 hours. Photos: (left) NPS; (right) NPS/Rich Bray

Proceedings from the 2017 conference can be found at:
<https://www.nps.gov/rlc/continentaldivide/research-conference.htm>

RMNP's next Research Conference will be held in 2019. Expect to see more about the next conference early in 2019. We hope to see you there!

Carissa Turner is the Science Communication Coordinator at the Continental Divide Research Learning Center in Rocky Mountain National Park.

Rocky Mountain Conservancy Conservation Corps 2017



A Powerful Season of Stewardship

In 2017, the Rocky Mountain Conservancy – Conservation Corps is hosting thirty-six youth serving on six crews throughout Rocky Mountain National Park and the Arapaho-Roosevelt National Forests. These crews will tackle projects related to disaster recovery, wilderness access, riparian restoration, off-highway vehicle trail use, and historic preservation.

In Rocky Mountain National Park, the Corps will support two crews. One will work on the east side of the park with the park's trails and resource management teams. The crew will be focusing on the Bierstadt Lake Trail along the switchbacks, moving up from Bear Lake Road, to repair the significant erosion that extensive shortcutting has caused on this trail. The crew will install structure to the trail to mitigate future damage and promote more sustainable visitor use. The Conservancy will also host a historic preservation crew on the east side of Rocky assisting with work on historic structures in Moraine Park. This will include some Mission 66 buildings in Moraine Park Campground, as well as some of the historic homes at this site.

Beyond the boundaries of Rocky Mountain National Park, the Conservancy anticipates providing four crews to the Boulder, Canyon Lakes, and Sulphur Ranger Districts in the Arapaho-Roosevelt National Forests. These crews will work in areas as remote as the Rawah Wilderness, restoring trail surfaces and insuring safe

trail access for wilderness visitors, and in areas nearby as the Big Thompson, Cache le Poudre, and St. Vrain watersheds to ensure recreation areas affected by fires and floods are rebuilt for ongoing visitor use. These crews will partner with the Indian Peaks Wilderness Alliance, Poudre Wilderness Volunteers, and Wildland Restoration Volunteers to extend their conservation efforts along the Front Range. On the west side of the Continental Divide, another crew will help repair and rebuild remote wetland crossings, mitigate human impact issues and promote visitor safety on the critical Upper Colorado Watershed.

In addition to the on-the-ground

work, the Conservancy program will facilitate job-skill development, providing participants with leadership training and offering career development activities as part of the program's goal to develop the next generation of public land stewards.

The Conservancy also piloted a new program under the Conservation Corps umbrella: the High School Leadership Corps. This two-week internship program in early June targeted younger high school students to introduce them to conservation projects, leadership development, and environmental education. Through this program, the Conservancy hopes to provide younger Coloradoans with a gateway experience to engaging with and learning about natural resource careers and developing a stewardship ethic.



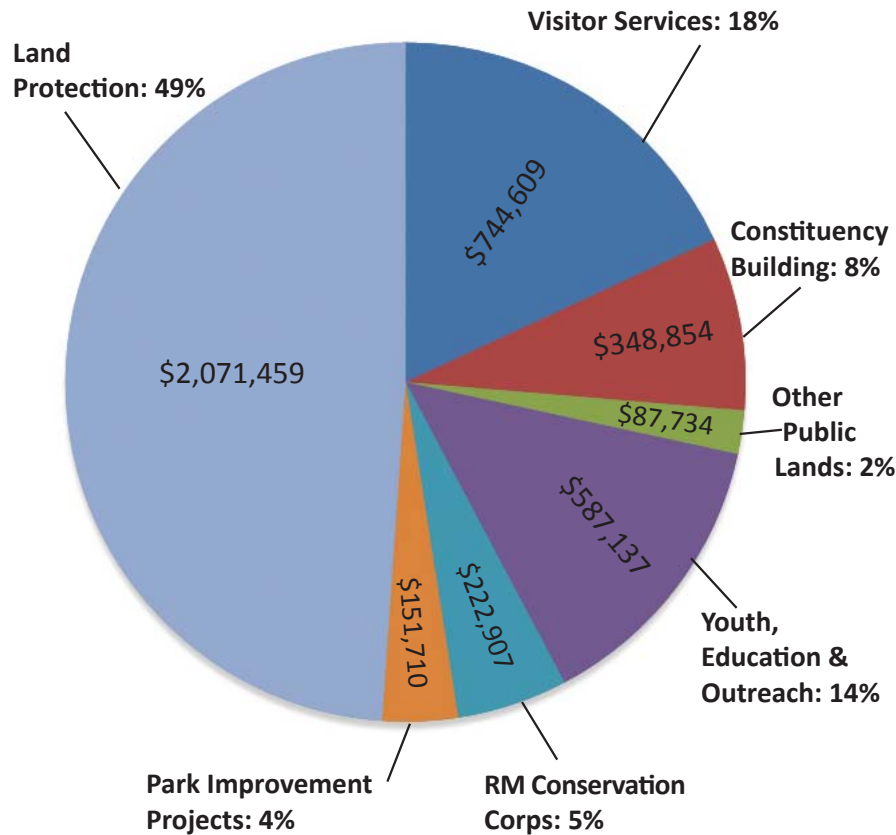
2017 High School Leadership Crew in June (left to right) Grace Burnett, Denver; Luc Almony, Broomfield; Jordany Muhigirwa, Denver; Grace Oh-Willeke, Denver; Brandon Ermatinger, Longmont; Zeke Cramer, Estes Park; Quinn Ross, Louisville; Dalton Schroeder, Fort Collins; Kayla Martinez, Lakewood; Curtis Jimmison, Broomfield

Statement of Financial Position as of December 31, 2016

(With summarized financial information as of December 31, 2014)

	2016	2015
Assets		
Cash and Equivalents	\$ 3,088,437	\$ 3,752,416
Investments	\$ 9,303,776	\$ 9,553,789
Accounts Receivable	\$ 25,238	\$ 5,347
Contributions Receivable	\$ 604,289	\$ 687,253
Prepaid Expenses	\$ 31,584	\$ 19,741
Inventory	\$ 454,832	\$ 436,890
Land Held for Sale	\$ 247,000	\$ 275,000
Property and Equipment	\$ 689,547	\$ 683,262
Total Assets	\$14,444,703	\$15,413,698
Liabilities		
Accounts Payable	\$ 86,247	\$ 72,677
Accrued Aid Payable	\$ 350,493	\$ 299,136
Accrued Expenses Payable	\$ 122,618	\$ 70,102
Deferred Revenue	\$ 3,493	\$ 4,435
Custodial Funds	\$ 13,242	\$ 69,199
Total Liabilities	\$ 576,093	\$ 515,549
Net Assets		
Unrestricted:		
Undesignated	\$ 1,177,259	\$ 1,138,190
Designated:		
Operating Reserves	\$ 1,200,000	\$ 1,200,000
Quasi Endowments	\$ 7,033,677	\$ 7,319,359
RMNP Funds	\$ 1,691,375	\$ 1,419,686
Temporarily Restricted	\$ 2,488,382	\$ 3,543,932
Permanently Restricted	\$ 277,917	\$ 276,982
Total Net Assets	\$ 13,868,610	\$ 14,898,149
Total Liabilities and Net Assets	\$ 14,444,703	\$ 15,413,698

2016 Support to Rocky Mountain National Park & Other Public Lands \$4,236,410



(Geese continued from page 3)

position from time to time).

The flock will not alter that migration imperative when Individuals become separated, but those individuals will join a different flock, which willingly accepts their inclusion. You can often see evidence of this in flocks flying in their familiar "V" formation. Notice that while most of the geese are similar in size, you may see a couple of individuals that are noticeably larger or smaller than the rest. These are of a different subspecies (of which there are many) that likely became separated from their original flock and joined up with another.

In 2004, the American Ornithologists' Union ascertained, based on genetic studies, that there are actually two species of similar-appearing geese formerly known as Canada goose. The name *Canada goose* was kept for the larger races, such as those breeding in Colorado, but the distinctly smaller ones, originating in northern North America and into the tundra regions, are now known as *Cackling goose*. We see Cackling geese in Colorado during migrations and during the winter months. — Retired RMNP Wildlife Biologist Gary Miller

(Porcupines continued from page 3)

frequently in the past 15 – 20 years in the deciduous forests along Colorado rivers. Scientific journals reflect very little recent work on porcupine population status, and NatureServe lists them as a widespread and demonstrably secure population status. There have been a couple of studies showing increased predation (by pumas!) in the Great Basin, and increased mortality (again, due to predation) during winters of high snowfall. — Retired RMNP Wildlife Biologist Gary Miller



Rocky Mountain Conservancy Earns Coveted GuideStar Rating

The Rocky Mountain Conservancy recently earned the coveted Gold GuideStar Nonprofit Profile participation level! This leading symbol of nonprofit transparency and accountability is presented by GuideStar, the world's largest source of nonprofit information. In order to be awarded the Gold Seal of Transparency, the Conservancy provided basic contact information, financial information, and our goals, strategies, capabilities, indicators, and progress, so you can donate with confidence. Check out our GuideStar Nonprofit Profile here:

www.guidestar.org/profile?id=84-0472090



Rocky Mountain Conservancy

The Rocky Mountain Conservancy expresses special thanks to the following people for their donations toward projects in Rocky Mountain National Park:

March 1, 2017 – June 7, 2017

239 gifts ~ total donations \$36,998

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PARK PUZZLER SOLUTION



CORRECTION:

The 2017 Spring *Quarterly* erroneously identified a photo of a blue grouse as a ptarmigan in the *Winter* article by Carissa Turner. Our sincere apologies! - NW



Rocky Mountain Conservancy

Esther Murdock, executive director
Nancy Wilson, *Quarterly* editor
PO Box 3100
Estes Park, CO 80517
(970) 586-0108

Bighorn lamb (Conservancy logo wannabe) on Half Mountain

Photo: Conservancy Member Marlene Borneman

Nature Notes

It's summertime! For many of us, it looked like summer was just not going to happen after more than 3 1/2 feet of snow fell in the park on May 23, and it certainly didn't look hopeful. The next few days, however, brought incredibly balmy temperatures which melted all the white stuff without preamble — at least below 8,000 feet. Snowpack above 10,000 feet is quite high for this time of year, and runoff is expected to be lively 🐾 RMNP Woodcrafter **Cory Johnson** observed some frisky elk behind his home in Estes Park that were taking advantage of a new home site that had piles of dirt from excavating the foundation. The elk herd would drift through almost every evening to play "king of the hill" on these dirt piles and he watched, amused, as one elk would get on top of the pile and try to fend off challengers. Inevitably it would have to come down to chase another usurper off the throne, leaving a vacuum for another to take its place. These elk seemed so excited about life, chasing each other all over the construction site, up one pile and over to the next, bucking and kicking, until they wore themselves out 🐾 Conservancy member **Marlene Borneman** was hiking to Cub Lake on Mother's Day weekend when she spotted a pair of Canada geese with five goslings in tow — quite a timely gift for Mother's Day, indeed! She watched the parents leading the goslings to a marshy area to feed, then herding them back into the water to swim farther from the trail where people were passing too close. One distracted gosling lingered but was not left behind, as one of the adults nudged it along with the others 🐾 While fishing at Lake Estes early one morning in June, Conservancy member **Jim Ward** watched as multiple vehicles drew to a stop on the adjacent Highway 36. He was curious, so on his way home he went over to investigate the area where the traffic jam had occurred. Apparently, an elk had given birth smack in the middle of the road, causing the traffic kerfuffle on the highway. A short time later, the calf was somehow moved alongside the bike path where Jim spotted it hunkering down in some long grass tufts. The mama was standing guard nearby and Jim was alerting folks approaching the scene about the protective mama. One woman on a bicycle ignored him and started to bike through the area. The mama elk stopped her, standing right in front of her. They stared each other down for about 20 minutes before the woman finally backed slowly away. She was very lucky. Mama elk can be very aggressive. After this standoff, the elk went and half-sat on the guardrail watching cars — like any new mom would do 🐾 On two occasions, *Quarterly* editor **Nancy Wilson** got a close-up look at a Cooper's hawk that was casing her bird feeders in Estes Park. Cooper's are easily erroneously identified as sharp-shinned hawks, and vice versa, because of their similar appearance. Key identification points, however, like overall size and curved vs. straight-cut tail feathers made her more confident. These hawks feed on small birds and are known for keeping a close eye on bird feeders that draw in these unsuspecting creatures 🐾 During vehicle training with the Conservation Corps and Field Institute



Don't try this at home! This person was very fortunate that the mama elk wasn't more aggressive — the newborn calf is nestled just to the right of the darker green grasses on the right side of the path. Photo: Jim Ward



The park is full of surprises! The day before the "Big Snow," Conservancy Member Marlene Borneman was on the Cub Lake trail photographing early wildflowers when out of the corner of her eye a delicate, brilliant white flower caught her attention. She recognized it as the small-flowered woodland star, *Lithophragma parviflorum*, but she had never seen it in Rocky before. What a thrill to discover!

Photo: Marlene Borneman

staff, the trainees encountered their first wildlife jam when we spotted a black bear and two cubs running across the hillside across from Sheep Lakes. 🐾 Retired RMNP Wildlife Biologist **Gary Miller** and Interpretive Ranger **Kathy Brazelton** noted a slightly earlier sighting (May 9) than most years of a yellow-rumped warbler near Cub Lake Trailhead. They also reported that during the late May snowstorm they spotted some unusual wildlife and behavior, including a blue jay visiting their feeder, perhaps blown up-slope from the plains; a long-tailed weasel running across Highway 66 in its characteristic weasel humping fashion; broad-tailed hummingbirds fighting through snow-laden currant bush blossoms to feed; and they watched cow and bull elk utilizing heads and hooves to create feeding craters in the deep wet snow 🐾 **Luke George**, science director at Bird Conservancy of the Rockies, reported that they had colorbanded more than 300 brown-capped rosy finches (and Scott Rashid, director of CARRI, put U.S.G.S. bands on a few hundred more) this winter to track sightings during the breeding season. They suspect that at least some of the colored banded birds will be seen in the park this summer, so if you see one while out in the park, and specifically along Trail Ridge Road, please do alert park staff 🐾 In late May, while hosting an evening event at the Fall River Visitor Center, Conservancy Director of Donor Relations, **Julie Klett**, saw an unusual lightning phenomenon. She was looking out at the crags on Deer Mountain when there was a blinding flash — a brilliant point of light surrounded by a kind of halo, not a meandering, zig-zagging bolt, or a vague flash. She thought it might have been a camera flash reflecting off the glass. Then it happened again. My companion said he had seen it, too. Was it just an unusual perspective? Was the bolt of lightning pointing directly at them? We may never know! 🐾 Don't forget to buy your Rocky entrance pass online to save time! And be sure to send us any fun/interesting/curious stories that you have while you are in the park to share in Nature Notes!