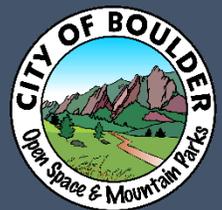




2018 Junior Ranger Program Report

In 2018, 83 Junior Rangers
worked **4,700 hours** on trail projects
reshaping/maintaining **500 drainage structures**,
creating over **230 feet** of new trail, shutting down
401 feet of social trails, and moving a daily record of
6 tons of rock for check dams! Junior Rangers
also worked an additional **68 hours** assisting
Forestry and Vegetation Management
crews, all in a total of **8 weeks**.



Prepared by Matt DeSimone and
Natasha Steinmann



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Executive Summary

The Junior Ranger Program offers paid jobs for teens ages 14 to 17 years old to work with the City of Boulder's Open Space and Mountain Parks (OSMP) department on a variety of natural resource projects. Each summer, hardworking and dedicated Junior Rangers complete trail maintenance and construction, forestry, vegetation, and ecological restoration projects across OSMP. Junior Rangers learn critical work skills, explore OSMP, support department goals, and serve the Boulder community. Through the Junior Ranger Program, youth also receive career and leadership development as they work beside project sponsors and natural resource professionals and attend organized talks with department staff.

Over the course of two four-week sessions in 2018, Junior Rangers participated in the following:

- Trail maintenance on 20 OSMP trails
- Two capital trail projects
- Vegetation clearing project
- Diffuse knapweed removal project
- Soil carbon sequestration project
- Weekly FEMP projects and forestry lessons with Chris Dirolf
- Resume building workshop
- The All Staff Master Plan Summit
- Goshawk Ridge ecology and history hike with Mark Gershman and Steve Armstead
- Bike to Work Day for session 1 Junior Rangers and program staff who ranked 13th place out of over 300 companies/businesses
- Sustainability challenge for session 2 Junior Rangers to encourage alternative transportation
- Accessibility hikes with Topher Downham
- Biodiversity lessons with Lynne Sullivan
- OSMP recreation hike with David Ford
- Marshal Mesa history hike with Chris Driver
- A Day in the Life of a Ranger and careers in natural resources talk with ranger Rick Hatfield

Since 1965, the program has built a legacy of community stewards who have a personal investment in the future of OSMP and all public lands. Graduates of the program carry their experience into the future by seeking future jobs in conservation, motivating siblings and friends to serve in the program, returning to OSMP as full-time staff, or continuing their experience as Junior Ranger Program staff. In 2018, 7 out of 16 program staff were once Junior Rangers themselves. And for some OSMP management staff, their first job was as a Junior Ranger.

The core mission of the Junior Ranger Program is to develop lifelong stewards of the natural world; and every year, Junior Rangers embrace this mission. Through daily conservation work, Junior Rangers gain a sense of awareness for the natural world and accomplishment for a job well done. They build the confidence to give back to their communities through collaboration, decision making, responsibility, reflection, and service.

"The program engages youth in OSMP and in their environments. This program has given me a sense of ownership and stewardship for Boulder's environment and has made me appreciate it more." – Third Year Junior Ranger



Background

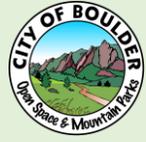
Junior Rangers join a long legacy of service to OSMP. Established in 1965 to create jobs for young people and help them develop work skills while maintaining Boulder’s public lands, the Junior Ranger Program has now employed over 4,000 youth. Junior Rangers serve for one of two sessions during the summer and are led by a well-trained crew of team leaders and program staff.

The Junior Ranger Program is based on service learning, which is an experiential education approach that combines learning objectives with community service to provide a pragmatic, progressive learning experience while meeting societal needs. As Junior Rangers, youth gain practical work skills while learning how maintenance and restoration projects impact larger environmental systems.

Junior Ranger crews help many OSMP workgroups meet their project goals. Crews complete projects in trail maintenance, forestry, vegetation management, and agriculture management. Exposure to these management practices combined with educational presentations provided by knowledgeable staff, develop lifelong stewards.



DURING CREW 1’S MORNING MEETING, A JUNIOR RANGER TAKES LEAD AND EXPLAINS WHAT TOOLS THEY WILL NEED FOR THE DAY.



Program Outcomes

As an employer of Boulder youth, our goals not only include meeting department deadlines and completing high priority projects, but also helping youth grow to become the very best versions of themselves. We proudly run a summer youth employment program that benefits youth as much as it benefits our community and our OSMP department.

We contribute to high priority OSMP projects. As described in the following pages, Junior Ranger crews are integral to the management and maintenance of Boulder’s Open Space and Mountain Parks system. With the enthusiastic and hardworking help of many young hands, OSMP staff are able to get huge amounts of work done in a short amount of time.



MANY HANDS MAKE LIGHT(ER) WORK. TWO CREWS OF JUNIOR RANGERS FORM A “FIRE LINE” TO PASS FRESHLY CUT SLASH EFFICIENTLY TO THE CHIPPER.

ZACH SHEPHERD 2018

We develop competent, workforce-ready young employees. Applicants for Junior Ranger positions do not need prior work experience because the program is structured to provide all the training necessary to help young people learn, grow, and succeed! Not only do Junior Rangers learn technical job skills such as how to properly set a stone step or use a sledge hammer with correct ergonomic form, they also learn critical work skills like timeliness, work ethic, professionalism, communication, and conflict resolution.

NEW FOR 2018, WE PARTNERED WITH PARKS AND RECREATION TO PROVIDE WEEKLY ERGONOMICS TRAINING.



DID YOU KNOW?

All youth who apply for Junior Ranger positions are granted an in-person interview. This means that you don’t have to be selected for a job to benefit from the program! Any young person who applies for a position gets the opportunity to practice critical job-hunting skills such as applying for a government position, requesting a letter of recommendation, and preparing for and carrying out an interview.



"I was a little worried about how [my son] would feel about it once the reality of the hard work set in. But I haven't heard a single complaint from him, and he looks forward to going every day (even after coming home yesterday after spending all day in poison oak/poison ivy)! He gets in the car to go home so energized by what they did, and he's very serious about making sure we leave on time, follow instructions, etc. It's really an awesome program you guys have put together and I'm so glad he's part of it." – Parent of a 2018 Junior Ranger

FUN FACT!

In 2018, 7 out of 16 program staff were once Junior Rangers themselves! By challenging themselves in new positions, they continue to grow as stewards and give back to OSMP.

We foster confidence and personal growth. Throughout the summer, Junior Rangers make powerful connections with each other and with the environment. Alumni frequently report that the most important things they gained as a Junior Ranger were confidence, a sense of self-worth, and leadership experience. With the mentorship of exceptional leaders, Junior Rangers gain confidence in their abilities, find purpose in their work, and realize the accomplishment of contributing to something greater than themselves.

"My experiences as a Junior Ranger were fundamental in developing my appreciation for the outdoors. Beyond that, I built an understanding of professionalism and work ethic that has allowed me to continue following my passions no matter where they take me."

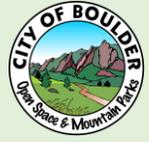
– 2018 Program Assistant and former Team Leader and Junior Ranger



OUR TEAM LEADERS WORK RIGHT BESIDE THEIR CREW TO SHARE ACCOMPLISHMENTS WITH EACH OTHER, ROLE MODEL LEADERSHIP, AND TEACH JUNIOR RANGERS HOW TO WORK HARD AND HAVE FUN.

We grow a culture of stewardship. Research shows that youth are spending less and less time outdoors, leading to less and less of a connection with the world around them and a responsibility to treat it with respect. The service learning model of the Junior Ranger Program gives Boulder youth the opportunity to connect with the land through hands-on experience while also learning about the environment. Youth work alongside natural resource experts and attend organized talks with OSMP staff to learn about stewardship principles. We promote the skills and values alumni will need to be engaged community leaders and land stewards.

"I enjoyed the program as a Junior Ranger in High School. This summer, I was especially impacted by the amazing community of staff and motivated by a desire to develop a closer relationship with our land." – 2018 Team Leader and former Junior Ranger



We teach the importance of teamwork, communication, and healthy relationships. Not only are these fundamental skills for any young person to develop, but they are predicted to be among the most valuable skills that employers will look for in 2020 and beyond.

According to Forbes and Business Insider, as our world becomes more technologically advanced, employers will be looking for strong social skills above all else. Ability to work in a team, solve complex problems, communicate effectively, and motivate and mentor others are consistently in the top 10 most desired skills.

The Junior Ranger Program inherently teaches these important skills through group decision-making, on-the-job troubleshooting of tricky trail concerns, and independent small group projects throughout the work day. OSMP natural resource professionals and our exceptional support staff provide Junior Rangers with the tools, feedback, guidelines, and instruction to grow, learn, and support each other.



CHRIS DIROLF TEACHING JUNIOR RANGERS THE HANDS-ON SKILLS FOR COMPLETING A FORESTRY PROJECT (LEFT). RICK HATFIELD SHARING WHAT ITS LIKE TO BE A RANGER AND OTHER FIELDS IN NATURAL RESOURCES (RIGHT).



Work Projects



Trail Maintenance: In two sessions, Junior Rangers completed trail maintenance on **20 trails across OSMP** property. From Lion’s Lair in the North to Goshawk Ridge in the South, with Flagstaff and Chautauqua trails in between, all four Junior Ranger crews helped maintain OSMP trails by performing semi-annual maintenance sweeps. This included cleaning and reshaping drainage structures, debarbing, corridor clearing, installing rock and log steps, shutting down social trails and general tread repair.

CREW 3
CLEANING AND
RESHAPING
THE OUTFLOW
OF A ROLLING
GRADE DIP ON
SPRING BROOK
TRAIL.

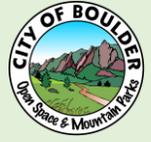


Capital Trail Construction: Junior Ranger crews supported trail reconstruction on Green Mountain West Ridge and flood damage recovery on Chapman Drive. On Green Mountain West Ridge, Junior Rangers moved excavated material, cut new trail, and assisted in construction operations with Mile High Youth Corps and the OSMP Trails team. One Junior Ranger crew worked with the Trails team and Greg Seabloom on a two-day project on Chapman Drive, **moving over 6 tons of rock** for check dams that were damaged in the 2013 flood.



CONSTRUCTING NEW TRAIL ON GREEN MOUNTAIN WEST RIDGE (LEFT). KENDALL ENJOYING HER TEAM’S HARD WORK AFTER FINISHING ONE OF MANY CHECK DAMS ON CHAPMAN DRIVE (RIGHT).

- TRAILS MAINTAINED:**
- Goshawk Ridge
 - Spring Brook
 - Doudy Draw
 - Amphitheater
 - Crown Rock
 - Saddle Rock
 - Green Mountain West Ridge
 - Gregory Canyon
 - Ranger
 - Meadow
 - Bluebell Mesa
 - McClintock
 - Lion’s Lair
 - Flagstaff
 - Chapman Drive
 - Tenderfoot
 - View Point
 - Skunk Canyon
 - Homestead
 - Towhee



Forest Ecology Management Plan (FEMP): Every Wednesday Junior Ranger crews took turns assisting FEMP crews on the Lindsay property. After FEMP thinned out a forested area, Junior Ranger crews were specifically assigned to chip felled trees and slash – a task requiring more people power than FEMP could supply. During these work days, the FEMP team also taught the Junior Rangers the basics of felling trees, fire mitigation and forest health.



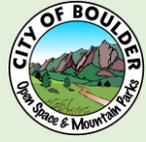
CREW 3 MOVING SLASH TO A CHIPPER AND DISPERSING FRESH MULCH ON THE LINDSAY PROPERTY.



Vegetation Management (VM): On the Khalsa property, Junior Rangers assisted Vegetation Management with non-native species removal and restoration work. With guidance from the Vegetation Management team, Junior Rangers helped remove diffuse knapweed while learning about local ecology.



JUNIOR RANGERS HARVESTING WILLOW FOR A WILLOW REPLANTING PROJECT.



Project Snapshot: Green Mountain West Ridge Trail



Throughout both sessions, Junior Ranger crews were assigned every week to work on a reroute of the Green Mountain West Ridge Trail. Junior Rangers and Team Leaders put in a **total of 130 hours** on the project. Much of the work involved displacing or broadcasting excavated material from the rough cut of the tread and restoring the old trail sections for regrowth. When displacing the excavated material from the rough cut, Junior Rangers worked in a line to broadcast the material off the downhill edge of the trail so that all the material was out of sight.

By the second session, Junior Ranger crews were learning how to calculate and define the backslope angle, how to spec new trail sections, and how to choose a method for naturalizing disturbed areas from trail construction. Thanks to Gabe Wilson, Beau Clarke, Troy Degroot, Jo Daloisio, Sam Greenburg, and Cameron Abbott for outlining Junior Ranger crews with projects and teaching them so much about new trail construction!

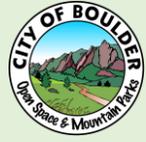


REMOVING EXCAVATED MATERIAL FROM TREAD ROUGH CUT (ABOVE), DEFINING THE BACKSLOPE AND MAKING TOP CUT OF NEW TREAD (BELOW), & DEFINING INSIDE HINGE AND BACKSLOPE (LEFT).



GREEN MOUNTAIN WEST RIDGE ACCOMPLISHMENTS:

- **230 ft** of new trail constructed
- **1,140 ft** of excavated material displaced from rough cut of tread
- **1,170 ft** of calculating and defining the tread's backslope
- **40 ft** of old tread restored
- **30 ft** of general tread repair
- **135 ft** of corridor clearing



Project Snapshot: Settler's Park Brush Removal



On July 24th, Junior Rangers and Junior Ranger Naturalists joined forces for the first time on an OSMP field project. 11 Junior Rangers from crew 4, 10 Junior Ranger-Naturalists, 3 Team Leaders, 2 Program Assistants, the FEMP team and Rangers teamed up to clear vegetation such as Russian olive from a hillside at Settler's Park to discourage illegal camping.

Junior Rangers pulled and "fire lined" branches and vegetation to a chipper while Rangers and FEMP cut down trees and brush. At the end of the work day, the once densely wooded area was thinned out considerably to make it more visible to the public eye and easier for Rangers to patrol.

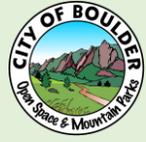


RANGERS AND FEMP OPERATING CHAINSAWS AND THE CHIPPER.



11 JUNIOR RANGERS AND 10 JUNIOR RANGER-NATURALISTS FORM A FIRELINE TO COVER THE DISTANCE BETWEEN THE CUT DEBRIS AND THE CHIPPER PARKED ON PEARL STREET.





Project Snapshot: Chapman Drive Flood Recovery

 On July 18th and 19th, Junior Rangers assisted a Trails crew and Greg Seabloom on Chapman Drive to build riprap check dams. On day 1, the project involved carrying stone from a quarry at the trailhead to build a check dam in an eroded gully up trail. On day 2, Junior Rangers loaded stone into a truck and built stone riprap check dams to armor two rolling grade dip outflows. When the project was completed, Junior Rangers calculated that they moved **over 6 tons** of rock!

BEFORE



RIPRAP FOR AN ERODED GULLY.

AFTER



RIPRAP TO ARMOR TWO ROLLING GRADE DIP OUTFLOWS.



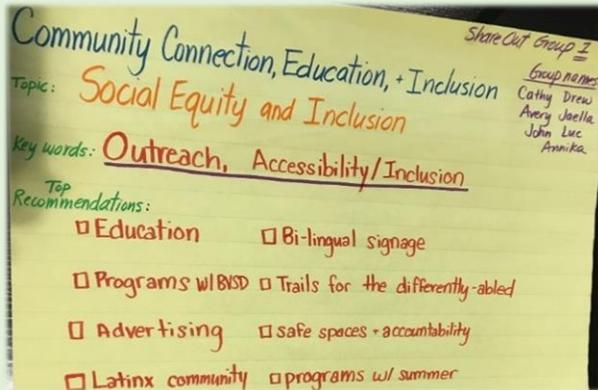


Crew Snapshot: Crew 1, Session 2

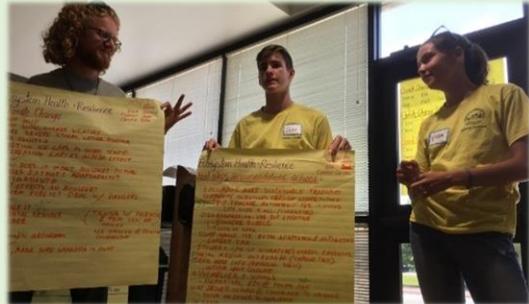
All Staff Master Plan Summit



On August 8th, Crew 1 and Junior Ranger-Naturalists attended the OSMP All Staff Master Plan Summit to share why they value our public lands and what their management hopes for the future are. Junior Rangers and Junior Ranger-Naturalists broke into groups of six to discuss topics of social equity and inclusion, climate change, and how they hope to see these topics addressed as the Master Plan develops. After sharing their ideas with each other, each group presented to all OSMP staff in the adjacent room.



JUNIOR RANGERS SHARE WHY THEY VALUE OUR PUBLIC LANDS AND PRESENT FUTURE MANAGEMENT IDEAS TO A FULL ROOM OF OSMP STAFF.



Fencing Project on Bluebell – Baird



Crew 1 spent two days installing **105 feet of buck and rail fence** to encourage trail visitors to stay on trail. The fencing was installed at the intersections of Bluebell-Baird, Chautauqua, and Flatirons Loop. Junior Rangers carried logs from Bluebell Road to the site and constructed the fencing on high-risk trail segments. Biodegradable coconut fiber was then laid down to allow vegetation to regrow on trampled areas.



INSTALLING BUCK AND RAIL FENCE TO ENCOURAGE TRAIL USERS TO STAY ON THE TRAIL AND RESTORE TRAMPLED AREA.





Future Program Opportunities

With 53 years of excellence to build on, there is incredible capacity to create more opportunities for youth to develop job and life skills, and for OSMP to benefit from the extra hands and minds of dozens of hardworking young people.

Junior Ranger/ Junior Ranger-Naturalist Merge: This fall, the Junior Ranger-Naturalist program (a wildly successful pilot program started in 2017) will merge with the long-standing Junior Ranger Program. Through this partnership and consolidation of resources, both programs will be better equipped to provide streamlined hiring processes, more well-rounded educational and work experiences for participants, and a more robust and skilled youth workforce to join OSMP staff each summer.

Youth Involvement in the OSMP Master Plan:

In August, Junior Rangers and Junior Ranger-Naturalists joined OSMP staff at an All-Staff Master Plan Summit to dive into the planning process of the OSMP Master Plan. OSMP is dedicated to incorporating and celebrating opportunities for youth to share their valuable perspective and knowledge. As part of that, we will continue inviting youth to participate in the Master Plan process as well as inviting youth to speak at the OSBT meeting this winter.



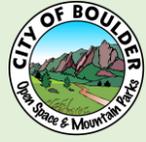
JUNIOR RANGERS AND JUNIOR RANGER-NATURALISTS BRAINSTORM AND COLLABORATE ON A MANAGEMENT PLAN FOR BOULDER'S PUBLIC LANDS.

More Opportunities for More Youth: Every year we must turn away about half of the youth that apply to our program because we don't have enough positions. Even the ones that are hired – our Junior Rangers and staff – regularly request longer crew options and more Junior Ranger positions in their end of season evaluations. As OSMP journeys through the Master Plan process, we will direct our program growth according to what the community asks for. This may include exploring ways to offer longer crew options and to provide opportunities for more of Boulder's youth.

"[The Junior Ranger program] employs young people, giving them work experience and helping maintain our beautiful backyard."

Building Skills and Confidence for Future Careers: A major outcome of the Junior Ranger Program is to help youth develop the skills they need to confidently apply for future jobs – whether in natural resources or not. This has inherently been a part of the program since its beginning, but in the coming years we hope to formalize partnerships with other organizations to create pathways for youth to build upon the skills they learn as Junior Rangers and apply them elsewhere in the community.

"[The Junior Ranger program] teaches youth the skills necessary to be effective, responsible leaders and stewards of our natural resources."



Acknowledgements

It takes a village to raise young stewards. The Junior Ranger Program would not be possible without the hard work, time and support of the dedicated conservation professionals at Open Space and Mountain Parks. The following individuals and work groups helped plan and set up meaningful projects and educational programming for our crews. Thank you! We couldn't do this without you.

OSMP Workgroups:

Trails
Agriculture Management
Rangers

FEMP (Forestry Ecology
Management Plan)

Vegetation
Management

OSMP Individuals:

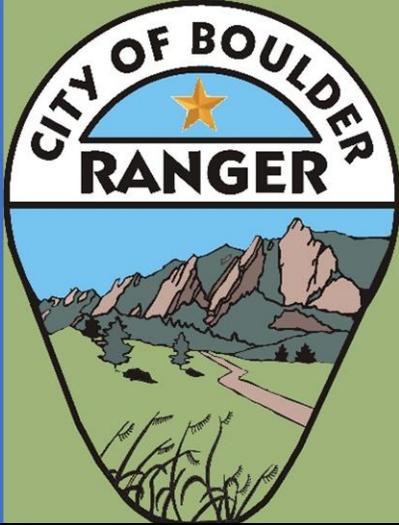
Cameron Abbott
Siga Andrew (Parks
and Rec.)
Steve Armstead
Dan Burke
Beau Clarke
Jo Daloisio
Mark Davison
Troy Degroot
Laurie Deiter
Matt DeSimone

Lisa Dierauf
Topher Downham
Christian Driver
Juanita Echeverri
David Ford
Jennelle Freeston
Mark Gershman
Sam Greenburg
Arian Hampel
Rick Hatfield

Kate Houlik (Parks and Rec.)
Lauren Kolb
Kevin Krayna
Lee Michael Krieger
Greg Over
Halice Rupp
Greg Seabloom
Natasha Steinmann
Lynne Sullivan
Josh Weinstein
Gabe Wilson



DAN BURKE SHARES HIS PROFESSIONAL JOURNEY WITH SESSION 1 JUNIOR RANGERS.



2018

Junior Ranger Naturalist Report



JRN Program Coordinator: Arian Hampel, Ranger/Naturalist
Operations Specialist

JRN Program Lead: Melinda Markin, Ranger/Naturalist

JRN Program Lead: Johnna Foster, Ranger/Naturalist

Prepared by

Melinda Markin and Arian Hampel



**City of Boulder
Open Space & Mountain Parks**

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The Junior Ranger Naturalists pose for a photo above treeline on Niwot Ridge during the alpine ecology hike.



Executive Summary

The Junior Ranger Naturalist (JRN) program is an opportunity for youth ages 14-17 years old to participate in skills-based training in natural resource management and customer service while exploring career paths in conservation. Participants were exposed to various aspects of what it means to be park rangers, and by engaging in experiential trainings, participants developed skills that can be applied to their academic and professional pursuits. The JRN Program provided participants the opportunity to interact with law enforcement officers on a daily basis to help youth build positive connections with law enforcement and professionals in natural resource protection.

The long-term goal from 2017 was to provide career development for youth in the field of natural resource management. To continue this goal into 2018, we organized talks with professionals from many different agencies. Several participants began the JRN program knowing they wanted to go into the medical field, and their knowledge of possible paths was limited to jobs within hospitals. After watching a medical rescue helicopter land and talking extensively with the flight crew on board, these students realized that many exciting medical careers exist outside of hospitals.

Over the course of the four-week program, JRN participants participated in the following activities:

- Remote camera setup and wildlife research
- Naturalist hike with historian Steve Jones
- How to write a ticket, wildlife telemetry training, radio communication
- CPR/First Aid certification
- Bird banding at Thorne Nature Experience
- Boulder Emergency Squad tour
- Boulder County Emergency Operations Center tour
- Mock search and rescue
- Fire mitigation, restoration, and vegetation clearing project
- Wildlife capture techniques
- Defensive tactics
- Water resources education program
- Trailhead maintenance and repair
- Alpine ecology hike, ecology & evolutionary biology research
- World Ranger Day
- Careers talk with OSMP director and Environmental Defense Fund
- Bat capture, ecology, and research
- Flood restoration and recovery project
- Helicopter and rescue flight education
- Wildland firefighting education program
- Fishing program for kids
- Cultural history hike with county rangers

At the end of the program, participants provided the following feedback:

“The JRN program helped me realize that conservation is one of my deepest passions, and it prepared me with the knowledge and skills I need to follow that passion. It had an enormous formative influence on me.”

“The Junior Ranger Naturalist program is the most outstanding outdoor education program for youth in the west. From this program directly, I have chosen to pursue a college degree and career in natural resource conservation. The four weeks I’ve spent in this program have created some of the most relevant moments in my young life.”



Above: JRN's learned the art of delivering an education program when they taught children under 10 years old how to fish at Sawhill Ponds.

Below: Wearing wildland fire gear and carrying a 40-pound fire pack isn't as easy as it looks while running a relay race.





Above: Wilfred the bear goes for a joyride during a teambuilding activity on the first day. Below: 90-degree heat and 70% humidity didn't slow down the work ethics of the JRN's when working with FEMP on a vegetation clearing project at Settler's Park.



2018 Participant Testimonials

“This program has truly changed the way I view nature conservation. I have discovered new things about myself, the outdoors, and the beautiful planet we live on through this amazing program. Each day I learn something new and exciting that 90% of my classmates at school wouldn’t know. This experience has opened up my doors to the future and allowed me to see how I can apply the skills I have learned in this program to real life. So finally, I would just like to say thank you for helping me see how this program will change my career and lifestyle in the future.”

Carina

“The JRN program helped me realize that conservation is one of my deepest passions, and it prepared me with the knowledge and skills I need to follow that passion. It had an enormous formative influence on me.”

John

“The Junior Ranger Naturalist program is the most outstanding outdoor education program for youth in the west. From this program directly, I have chosen to pursue a college degree and career in natural resource conservation. The four weeks I’ve spent in this program have created some of the most relevant moments in my young life.”

Chris

“This program has given me opportunities and experiences that I never would have been able to have without it. Being able to witness firsthand the transformative powers of the natural world has truly been life changing. I have learned things about the world and the environment that have made me change my habits to help contribute to the conservation of the beautiful world we live in. I have also become a much stronger leader through being a part of this group. I have a much greater understanding of how to communicate with others and collaborate to bring about positive change. I have learned skills that I know will not only help me in college, but will also help me for the rest of my life. This program has really helped me find myself and discover my strengths and weaknesses. I am so grateful for this experience and I know that I will remember it for the rest of my life.”

Brooke



Constant smiles seemed to be the theme of the JRN program as exemplified in this shot of The Human Knot, a teambuilding activity at World Ranger Day.

“The Junior Ranger Naturalist program has been one of the best things to happen to me during high school. Every weekend I would wake up, waiting and wishing that it was Monday. I love the program so much that I wanted the weekend to be over, so I could go back to work.”

Luc

“Getting to spend so much time learning about plants and animals in OSMP and how we have the power to protect the environment and make the world a better place for nature and humans was a transformative and eye-opening experience. The skills I have learned in this program have definitely changed my outlook on this career area in a positive way. It will be something that could steer my life towards a whole new path, or at the very least give me knowledge I can carry with me forever and use to educate others. I will forever be grateful of the Junior Ranger Naturalist program and those who support and run it.”

Skyler



Skyler proudly holds Jackie the bird at Thorne Nature Experience. JRN's put a band with a unique identification number on each bird's leg and recorded the number for future generations of ornithologists to track.

Background

In its second year, the Junior Ranger Naturalist (JRN) program positively affected the lives of 12 high school students ages 14-17. The above testimony from program participants illustrates the transformative power of the program in just four short weeks during the summer of 2018. Participants



JRN's study a butterfly field guide after the naturalist hike with Steve Jones.

were exposed to various aspects of what it means to be park rangers while learning about conservation, natural resource management, customer service, and career development. By engaging in experiential trainings, participants developed skills that can be applied to their academic and professional pursuits.

Additionally, participants worked directly with rangers and other first responders to help establish meaningful relationships between youth and first responders. The JRN Program provides participants the ability to interact with law enforcement daily, helping build positive connections with law enforcement and natural resource protection professionals.

This program was conceived several years ago and was further advanced because of Ranger Arian Hampel's attendance at the World Ranger Congress in Estes Park, Colorado in 2016. The

World Ranger Congress brings together rangers from all over the world to share knowledge and create partnerships to enhance conservation efforts globally. This forum helped solidify the need to engage and connect youth to nature and local parks and to help youth build positive relationships with rangers and their parks.

Junior Ranger Naturalist Mission

The Junior Ranger Naturalist program is an opportunity for youth ages 14-17 years old to participate in skills-based training in natural resource management and customer service while exploring career paths in conservation. The program instills an environmental stewardship philosophy for participants to be ambassadors of the natural world and to enjoy and promote responsible outdoor recreation. This program helps participants develop an appreciation for nature by working with park rangers and other natural resource professionals in the community.

Junior Ranger Naturalist Vision

Allowing for the future growth and development of the Junior Ranger Naturalist program through youth involvement in future program planning, land management planning, working to establish local and international partnerships, and encouraging opportunities for participants to be mentors to the next generation.

Core Concepts

- Leadership
- Teamwork
- Communication
- Environmental conservation and land stewardship
- Natural resource management
- Connection to the natural world
- Customer service
- Interpretation of the natural world and recreation
- Professionalism and accountability
- Skills building
- Career development
- Emergency response
- Safety



Megan installs a "No Parking" sign at the OSMP-owned 4th of July trailhead west of Eldora, CO.

Program Goals

Building on successes of the 2017 JRN program, this year we were able to incorporate 2017 goals into programming for 2018. One goal on which we wanted to focus more this year was increasing field-based work with rangers related to community ranger projects and fire mitigation. To accomplish this, JRN participants worked with Ranger Brandon Garret and the City of Boulder's Forest Ecosystem Management Plan (FEMP) team to clear vegetation from a hillside on OSMP property that had become overgrown with non-native plants. Working alongside Junior Ranger crews, JRN learned practices used in wildland firefighting such as swamping (hauling away trees and shrubs after FEMP members cut them down with chainsaws) and simulating work done by a hand crew on a fire line. The hard work put in by all participants resulted in successful fire mitigation work with the added benefit of providing more visibility for rangers on patrol in this area. Through this project, JRN directly contributed to a safer wildfire buffer for nearby neighborhoods in Boulder and created a safer patrol area for rangers.



Annika loved teaching children how to tie fishing knots during the education program the JRN's hosted for kids at Sawhill Ponds.

The long-term goal from 2017 was to provide career development to youth in the field of natural resource development. To continue this goal into 2018, we organized talks with professionals from many different agencies. Several JRN participants began the JRN program knowing they wanted to go into the medical field, and their knowledge of possible jobs was limited to jobs within hospitals. After watching a medical rescue helicopter land and talking extensively with the flight crew on board, these students realized that many exciting medical careers exist

outside of hospitals. JRN's also had the opportunity to meet with Dan Burke, Interim OSMP Director, about various career tracks within the department including finance, wildlife management, invasive plant species management, wildland fire mitigation, and human resources. Kevin Bracy Knight, OSMP Board of Trustees member and research scientist with the Environmental Defense Fund, also engaged the JRN's in conversation about how careers in research and data science provide another avenue into conservation. JRN program director and City of Boulder Ranger/Naturalist Arian Hampel discussed opportunities in wildlife conservation, wildlife biology, wildlife criminal investigations, and natural resource management. During the visit to the University of Colorado Mountain Research Station, JRN's visited active field research sites of graduate students and principal investigators from multiple universities in montane and alpine ecosystems. JRN's toured the Mountain Research Station facility and saw a glimpse of graduate-level research and a career track in academia. At the conclusion of the four-

week program, participants learned skills that rangers use on a daily basis and were exposed to the myriad possibilities of careers in conservation.

Program Activities

Each day during the four-week program brought new and exciting activities for the JRN's including:

Remote camera setup and wildlife research

The 2017 Junior Ranger Naturalists set up a wildlife camera on Flagstaff which the 2018 crew revisited. The camera captured photos and videos of cougars, black bears, elk, wild turkeys, mule deer, bobcats, pine squirrels, striped skunks, spotted skunk, and red foxes. After downloading the data, the JRN reinstalled the camera for next year's crew to view.

Naturalist hike with historian Steve Jones

The JRN's had the opportunity to spend a morning hiking with historian and renowned naturalist Steve Jones who taught participants about birds, butterflies, and ecological relics of Long Canyon. Thanks to Steve's expert knowledge, JRN's were able to identify butterflies everywhere they visited for the rest of the program.

How to write a ticket, wildlife telemetry training, radio communication

Ticket writing, navigation, and communication are essential parts of being a ranger, and the JRN's got a taste of all these activities through hands-on exercises. Participants had the opportunity to simulate writing tickets to each other, practice searching for a tagged wild animal using telemetry techniques, and communicate with "dispatch" over radios.



Top: After learning how to identify birds and butterflies of OSMP, JRN's spotted fritillary butterflies everywhere they went.

Middle: Annika and Luc thoroughly enjoyed themselves as they helped the Vegetation Management crew compact slash to be hauled away in the trailer.

Bottom: JRN's passed a practical test in order to earn their CPR/First Aid certification.

CPR/First Aid certification

Boulder County Ranger Sarah Andrews and Boulder County Volunteer Coordinator Amanda Hatfield spent a full day teaching the JRN's about basic life-saving techniques and CPR. At the end of the day, each JRN tested out of the program and earned her or his CPR & First Aid certifications.

Bird banding at Thorne Nature Experience with Dr. Oakleigh Thorne II

Legendary naturalist and ornithologist Dr. Oakleigh Thorne II taught the JRN's how to safely handle birds and attach bands to the birds' legs at the [Thorne Nature Experience](#). Each band was engraved with a unique identification code that Dr. Thorne recorded to track the birds' movements over time. For most of the participants, this was the first time they had held a bird, and they were very excited to share their new knowledge with a group of eager small children who couldn't wait to see the birds up close and watch them being released with the new bands.



In an impromptu education program, JRN's taught children about bird banding at Thorne Nature Experience.

Boulder Emergency Squad

City of Boulder Ranger Johnna Foster and Boulder County Ranger Lucas Hayas gave the JRN's a tour of the facilities where [Boulder Emergency Squad](#) (BES) is housed. As the primary volunteer search and rescue organization in Boulder County, BES is equipped to respond to any emergency from water rescues to wildland fires to vehicle extrications. JRN's had the opportunity to walk through BES's mobile command vehicles, see the gear carried by wildland firefighters, and learn how unmanned aerial systems are used in search and rescue.

Boulder County Emergency Operations Center

Boulder County's [Emergency Operations Center](#) was an eye-opening experience for many of the JRN's because they saw behind the scenes of how emergencies are handled. JRN's talked with staff who ran incident command during disasters such as the 2013 flood, and they watched dispatchers manage five computer screens at once while simultaneously fielding 911 calls from the public and communicating over the radio with officers, fire personnel, and medical responders on duty.

Search and rescue

In one of the most exciting days of the program, Ranger Kent Coghill led the JRN's through mock search and rescue scenarios on a remote OSMP property west of Flagstaff Mountain. Working in groups of four, JRN's were given a description of injured hikers and had to use their knowledge from a basic search class and CPR/First Aid training to find the hikers and treat their injuries. The most challenging scenario required the JRN's to perform a grid search over a large area. The JRN's formed a line about 50 yards long with all 12 participants and utilized techniques employed in search and rescue to meticulously search for another simulated lost hiker. In this scenario, the JRN's were not successful in finding the hiker on their first sweep, which was an excellent representation of the difficulties of search and rescue in the real world.



Above: Upon finding a simulated lost and injured hiker, JRN's utilized their new CPR and first aid skills during the mock search rescue scenarios.

Below: Zach and Samantha practice target shooting with dart guns in a program in which JRN's learned about chemical immobilization used in wildlife research.

Fire mitigation, restoration, and vegetation clearing project

Settler's Park is a popular destination on OSMP's land. Over the years, many nonnative plants have overtaken the hillsides in dense groves, causing a) competition for native plants, b) poor visibility for rangers on patrol in the area, and c) fire hazards for nearby residences. Partnering with Ranger Brandon Garret, the Junior Rangers, and the Forest Ecology Management Plan (FEMP) crew, JRN's spent a day clearing vegetation at Settler's Park. The JRN's learned the swamping technique used in fighting wildland fires in which they hauled away logs and branches as the FEMP crew sawed and cleared vegetation.



Wildlife capture techniques

What is wildlife conservation research and what are some of the tools used by wildlife professionals? JRN's learned about the types of wildlife capture techniques and chemical immobilization currently used.

JRN's practiced shooting dart guns at targets, helping them understand the challenges associated with proper dart delivery. This activity provided the youth staff with the opportunity to practice real-world wildlife immobilization techniques.

Defensive tactics

Officer safety is of utmost importance to park rangers, and the JRN's spent an afternoon practicing basic defensive tactics with Ranger Dave Gustafson, a trained defensive tactics instructor. JRN's learned how to protect themselves using verbal commands, kicks, strikes, and blocks and had the opportunity to utilize these skills in a sparring match with Ranger Brandon Garret.

Water resources education program

Where does water in Boulder County come from? How do climate and disturbance events upstream such as the 2013 flood impact the water we drink here? Boulder County Ranger Supervisor Bevin Carithers and Statewide Interpretation & Wildlife Viewing Coordinator for Colorado Parks and Wildlife Mary McCormac explored these questions and more with the JRN's in an education program about one of our most precious resources: water.

Trailhead maintenance and repair

Owned by the City of Boulder and surrounded by Indian Peaks Wilderness west of the town of Eldora, CO, the 4th of July trailhead is one of OSMP's hidden gems. JRN's worked on repairs and general maintenance of the 4th of July trailhead. JRN's used rock bars and rock carriers to reposition large boulders to protect a nearby meadow, they installed new parking signs to help clarify designated parking sites, and they repaired a trail that had experienced erosion.

Alpine ecology hike, ecology & evolutionary biology research

In a partnership with the University of Colorado, the JRN's visited the [Mountain Research Station](#) and learned about alpine ecology from botanist and Ranger Melinda Markin while hiking through alpine tundra. JRN's observed science in action as current CU-Boulder Ph.D. students worked in their field research sites. The day culminated with a tour from Bill Bowman Ph.D., the director of the Mountain Research Station, who opened doors for the JRN's into the possibilities of graduate- and undergraduate-level research in ecology and evolutionary biology in the alpine.



Above: Carina successfully detains a visitor in violation of OSMP regulations during defensive tactics training.

Below: Skyler performs a front kick to keep a potential assailant at bay.



World Ranger Day

[World Ranger Day](#) is an international celebration and commemoration of the work rangers do to protect the world's natural and cultural resources. The JRN team was able to meet rangers from a variety of agencies in the Boulder area including Louisville, Eldorado Canyon State Park, and Boulder County. Additionally, they learned about some of the international ranger work and how climate change impacts park management from Ranger Ted Talbot of the Countryside Ranger Association of the United Kingdom.



JRNs celebrate World Ranger Day with rangers from many agencies including City of Boulder, Boulder County, Louisville, Colorado Parks & Wildlife, Eldorado Canyon State Park, and Countryside Rangers of the United Kingdom.

Careers talk with OSMP director and Environmental Defense Fund

OSMP Interim Director Dan Burke as well as Open Space Board of Trustees member and Environmental Defense Fund research scientist Kevin Bracy Knight spent an afternoon talking with the JRNs about careers in conservation. From jobs in wildlife, forestry, restoration, finance, and human resources, Dan Burke gave an overview of the possibilities available in open space departments. Kevin Bracy Knight shared some of his current conservation research projects that he tackles using data science and computer modeling.



JRNs introduce themselves to Dick Lyman, OSMP's first ranger, at World Ranger Day.

Bat capture, ecology, and research

The JRN's explored open space at night with world renowned bat expert Rick Adams of the University of Northern Colorado and Burton Stoner, City of Boulder Ranger Services Supervisor. As darkness fell, the JRN's watched Dr. Adams capture four bats using a mist net under the stars. JRN's learned about bat ecology & biology and used specialized equipment to hear the bats' echolocation which is otherwise undetectable by the human ear. Fun fact: it is a myth that bats cannot take flight from the ground. The JRN's watched one bat flutter out of Dr. Adams' hands onto the ground where it flapped its tail membrane ([the uropatagium](#)) in opposite strokes of the wings in order to take off from the ground.



Above: Ranger Burton Stoner holds a small-footed *Myotis ciliolabrum* as the JRN's observe and learn about bat ecology during a night hike.

Flood restoration and recovery project

The 2013 floods devastated many ecosystems in Boulder County, some of which are still undergoing repair and restoration. JRN's worked with the City of Boulder's Vegetation Management crew in the Bluebell Creek drainage at Chautauqua to restore a creek bed that provides critical habitat for wildlife such as black bears.

Below: JRN's helped clear overgrown vegetation while working on a restoration project at Chautauqua.



Helicopter and rescue flight education

In one of the highlights of the 2018 JRN program, the JRN's had the opportunity to watch a [Flight for Life](#) helicopter that specializes in emergency medical evacuations land on Open Space property. JRN's learned about what kind of training it takes to become a flight nurse or medic as well as the various opportunities to work in the medical field outside of hospitals.



Helicopter flight medics teach the JRN's about careers in outdoor and rescue medicine.

Wildland firefighting education program

Boulder County Ranger Sarah Andrews and Boulder County Education Intern Megan Kocina led the JRN's through fundamentals of fighting wildland fires. The JRN's learned how fire behaves under various weather conditions, how to deploy a life-saving fire shelter, and how to spin weather. These are some of the basic skills that all wildland firefighters learn in the wildland fire certification course to earn the "red card."

Fishing program for kids

The JRN's spent a morning teaching children under 10 years old how to fish at OSMP's Sawhill Ponds. From knot tying to casting to practicing patience, the JRN's taught children all aspects of fishing. A few children even caught some fish! At the end of the education program, the children took their fishing poles home and hopefully left with a new love for fishing as an outdoor recreation opportunity.



Twin girls were very excited to learn how to tie fishing knots and use a fishing pole from Carina who practiced extraordinary patience.

Cultural history hike with county rangers

Boulder County Ranger Jason Vroman and County Education Intern Megan Kocina led the JRNs on a hike through County Open Space property. We visited a semi-hidden waterfall and learned about the rich homesteading and mining history as we passed by the remains of old home sites and mills. The JRN's ended the day at Caribou Ranch where they toured the historic DeLonde Barn that has been restored and is currently used to host the county's [Artist-in-Residence Program](#).



Goofy pictures provided some of the most memorable moments, such as this one at the hidden waterfall on County Open Space property near the Sourdough trailhead.

Youth Career Development

Exploring career paths can be a daunting challenge for anyone, especially high school students. The City of Boulder Open Space and Mountain Parks department has a legacy of providing youth with career opportunities in natural resources. The Junior Ranger Naturalist Program continues this legacy by providing seasonal employment for high-school aged youth from 14-17 years old. This career opportunity allows team members to prepare a resume and references, apply for a government position, and undergo a professional interview. High-school aged applicants go through a real hiring process, helping them start to build practical life skills.

Once hired, the Junior Ranger Naturalist are employees of the City of Boulder. As OSMP staff members, youth are responsible for conducting themselves as professionals and gaining further career development opportunities while working as a team. The Junior Ranger Naturalist Program emphasizes team cooperation and building leaders within the group. The result is that members are responsible for holding each other accountable both as part of a team and as individuals.



JRNs navigate obstacles on Flagstaff summit during teambuilding activities early in the program.

Future Program Opportunities

- Continue to develop and refine partnership opportunities with other governmental and non-governmental entities.
- Incorporate the ranger legacy of Search and Rescue Dog program started by OSMP in the 1970's.
- Involve youth in more decision-making processes within OSMP and partners.
- Collaborate with youth to further develop the JRN program every year.
- Further incorporate the International Ranger Federation and World Ranger Day into programming. For example – youth involvement in the Rangers without Borders Program and establishing a youth-led sister park program.
- Create on going service learning opportunities for JRN program participants. Service-learning is a teaching and learning strategy that connects academic curriculum to community problem-solving. We would like JRN participants to adapt more academic curriculum and the best available science to community problems and help develop small work projects related to natural resource conservation and protection.
- In partnership with Boulder County Parks and Open Space, develop a youth advisory board specifically related to undertaking natural resource issues important to youth. Involving and giving a voice to future generations in current and future planning processes.
- Conduct research projects on OSMP or in collaboration with the University of Colorado Boulder at the Mountain Research Station



Zach caught a toad! There was never a dull moment with the JRN's, even when they were waiting their turn to shoot the dart guns as Zach was when he entertained the others with his fearlessness. The toad was safely released back into the wild unharmed.

Acknowledgments

This program would not be possible without all the hard work and time from dedicated conservation professionals, emergency responders, and educators who helped with this program.

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Flight for Life Flight Crew

Jones, Steve | Naturalist, Historian, and Author

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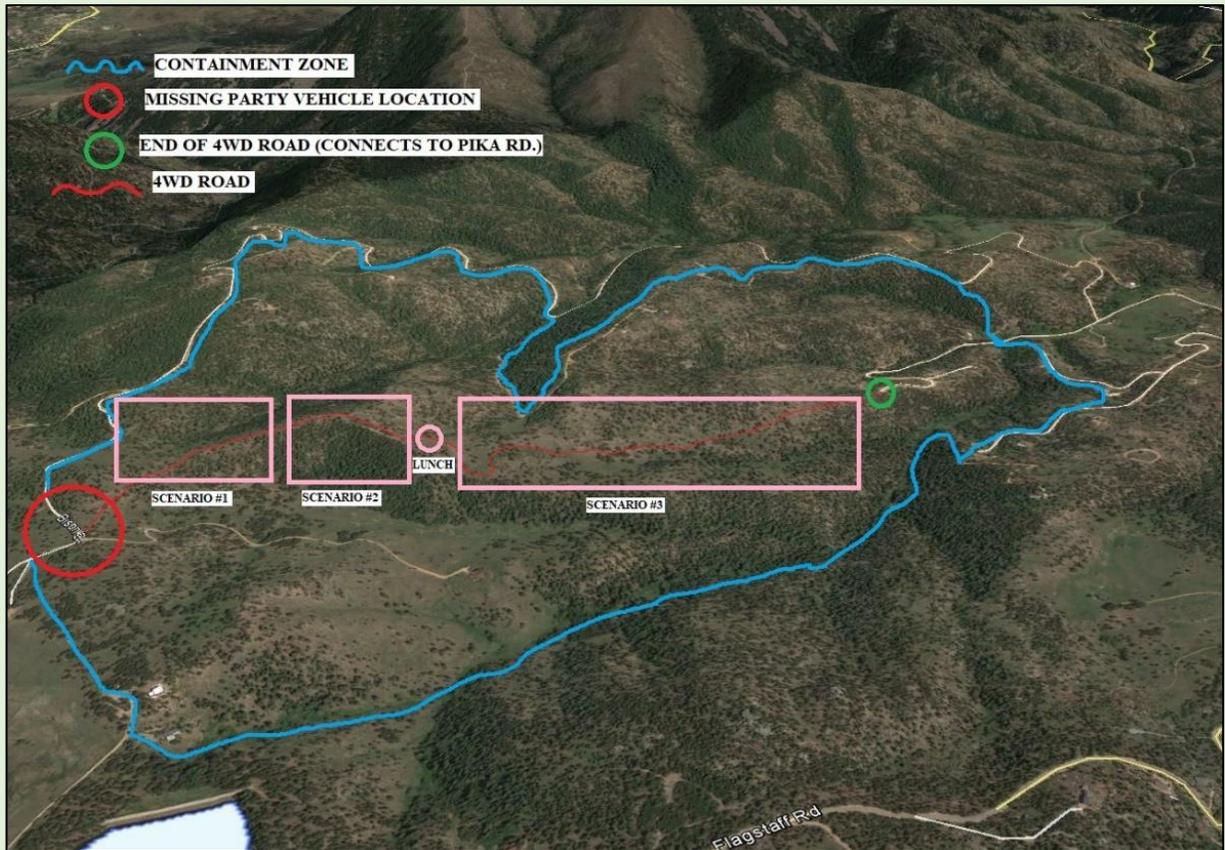
Talbot, Ted | MSc., Manager at Countryside Ranger Association of the United Kingdom

Thorne II, Oakleigh | Ph.D., Thorne Nature Experience Founder

University of Colorado Boulder Mountain Research Station

Appendix – Photo Gallery

Overview map of Bison Drive west of Flagstaff Mountain where the mock search and rescue scenarios took place.



Night vision picture of JRN's waiting to capture bats on the night hike.



Samantha teaches a young boy how to cast during the fishing program for kids at Sawhill Ponds.





Above: Hilarity ensues when all team members, including leaders, attempt to hide a water bottle from Skyler during a teambuilding activity on the last day.

Below: Zach makes friends with the Boulder County Sherriff's Office search and rescue dog at World Ranger Day.





Above: Mark Davison, Manager of OSMP's Community Connections & Partnerships Division, teaches the JRN's about the history of government parks from ancient to modern times.

Below: The rescue Flight for Life helicopter provides a dramatic backdrop for a group photo.





Above: Ranger and JRN Coordinator Arian Hampel shows a young child how to pull a hook out of a fish's mouth.

Below: The unbanded birds hold a conference before receiving their bands and being released.





Above: The JRN's have a knack for educating and entertaining small children while bird banding at Thorne Nature Experience.

Below: Brooke, Fiona, and Chris mentally prepare themselves to greet attendees at the World Ranger Day celebration on Flagstaff summit.





Above: Brooke gets creative with the supplies used to practice tying fishing knots.

The JRN's dug really deep post holes at the 4th of July trailhead in order to securely install new parking signs.



Megan assists in blowing up balloons for target practice during the wildlife darting activity.





Above: Hauling away brush during the restoration project at Chautauqua hardly feels like work when participants have as much positive energy as the JRN's did!

Below: Ranger Brandon Garrett didn't stand a chance against John in defensive tactics training.





Above: Many hands make light work when it comes to repositioning large boulders at the 4th of July trailhead.

Below: Teamwork and communication were executed perfectly during this teambuilding activity in which JRN's had to construct a cube, balance it on one corner, and walk through holding hands without knocking it over.





Above: Ranger and JRN Coordinator Arian Hampel describes names and uses of various fire tools during wildland fire training.

Below: JRN's interact with Junior Rangers during the Master Plan engagement day with OSMP staff.





Megan delivers a powerful side kick against an assailant.



Zach imagines what it's like being a flight medic on a rescue helicopter as he poses in the passenger seat.

Ranger Kristin Moldenhauer imparts her wisdom about how to give an effective interpretive program so the JRN's are equipped with the necessary skills to teach children how to fish in their upcoming program.





Above: JRN pile into the Flight for Life helicopter.

Below: Luc poses with Ranger Lisa Gonçalo at World Ranger Day.





Above: Expert fishing guide Megan demonstrates the various uses of the tools in her fishing lanyard.

Below: Ranger Kristin Moldenhauer leads the JRN's through the sensory trail experience in which participants close their eyes and use other senses to navigate the trail.

