



Science in the Crown

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Chasing Glacier's "Rock Rabbits"

By Lucas Moyer-Horner, Ph.D. Candidate, University of Wisconsin - Madison

I see talus everywhere I go. I can't help it. Rafting down the Flathead's Middle Fork I stare at the large irregular chunks of rock along the Western shore; the folks who built the railroad put them there to support the tracks and buffer against peak spring runoff, I'm looking for pika signs.

"The first person to spot a haypile gets dinner on me," I say to the ten pika team members crammed side-by-side around the rim of the raft.

"I see one," says Susan, smirking. I look beyond her extended index finger to a collection of smooth bleached wood, mostly big branches, deposited by the river under a large rock.

"Good work!" I say facetiously, "you may have found the largest haypile from the largest pika in the world!"

American pikas (*Ochotona princeps*) may not be strong enough to haul entire trees to their winter food cache (haypile), but I've seen piles eight feet long and three feet deep, stuffed with fir needles, pine cones, grasses and forbs. Like other lagomorphs (rabbits and hares), pikas do not hibernate. Instead they tenaciously collect vegetation and stuff it under or beside a large rock to dry, ensuring a rot-free winter calorie source with less toxic chemical compounds. Pikas' flurry of haying during late summer allows them to sit tight under rock and snow insulation,



NPS Photo by Danny On

American pikas inhabit rocky talus slopes throughout the Crown of the Continent Ecosystem. Current estimates, which place pika numbers in Glacier National Park at around 1,500-2,000 individuals, suggest the park's population is healthy.

waiting patiently for the long winter to succumb once again to spring's thaw.

I saw talus while gazing out the window of the "Rail Runner" commuter train from Albuquerque to Santa Fe, while attending the Ecological Society of America conference this August. Like in Glacier NP, freeze-thaw cycles have fractured exposed bedrock in the New

Continued on pg. 3

Director's Corner

By Tara Carolin



I am very excited to be stepping into the role of Director of the Crown of the Continent Research Learning

Center (CCRLC). I began acting in this capacity last January and have inherited a terrific work team and a great legacy of exciting projects. Our first big accomplishment this year was the publication of the *Invasive Plants of the Crown of the Continent* field guide. This project was conceived by the Crown Managers Partnership and initially funded by the NPS Intermountain Region International Conservation Program (IMRICO) with additional contributions from a wide range of partners. Our CCRLC staff, Jami Belt, Melissa Sladek, Paul Ollig, and Tim Gibbins, developed the guide, with help from park IPM biologist, Dawn LaFleur, and distribution has begun of the 10,000 copies that were printed this summer.

I'm also pleased with the success of our Citizen Science Program under the coordination of Jami Belt, Susan Sindt, Melissa Sladek, and Melissa Peterson. Due to the generosity of donors such as the Glacier National Park Fund, NPS Parks as Classrooms, and Glacier National Park Associates, we have continued into our fifth year of loon monitoring and our second year monitoring invasive plants and high country species.

Our baseline database is growing tremendously, and it is gratifying to see the dedication and enthusiasm of the volunteers and hear about their amazing experiences in the

park, such as witnessing a grizzly bear take down a mountain goat kid.

We funded two more Jerry O'Neal students this year for a total of eight students sponsored since the fellowship was first offered in 2007, and we now have final reports from the first year's students. This summer we also kicked off a project to study Clark's Nutcrackers funded by IMRICO and the NPS Biological Resources Management Division. Two graduate students, Jennifer Scott and Monika Maier, have been hard at work studying the birds and their habitat all summer.

A brochure explaining a multi-agency program to monitor grizzly bear status and trends will soon be at the printers, and a number of bulletins on a range of resource topics are at or near completion this year. Another highlight was the 6th annual Waterton-Glacier Science & History Day where 13 peace park researchers updated over 150 people about their discoveries. To date, we have sponsored more than a dozen brown bag presentations and provided access to monthly climate change webinars in 2009. We appreciate all the work of our versatile clerk, Billie Thomas, in facilitating our public presentations and all the day-to-day functions of the learning center.

The CCRLC recently took over supervision of Glacier's George C. Ruhle Library and hired a new librarian, Sheree West, who has enthusiastically stepped into the role and earned many letters of kudos from library patrons. I am also enthused about our Science Liason, Paul Ollig's, work in developing a web page for the CCRLC and keeping the public up-to-date with a CCRLC blog, a NASA-sponsored Climate Change podcast series, and various social networking tools that are in the works.

Glacier National Park had 75 investigators with active research permits in 2009, and we eagerly await the results of their studies so we can pass those discoveries on to a wider audience. I look forward to continuing work with the staff of the CCRLC, Glacier National Park, the Rocky Mountain Inventory & Monitoring network, and other partners, both old and new, as we continue to develop educational opportunities regarding the latest research about the astounding resources in the Crown of the Continent.

Tara joined the staff of the CCRLC in January, 2009, as acting director. She was selected as the new director of the Research Learning Center in August.



Crown of the Continent
Research Learning Center

"Science in the Crown" is a bi-annually published journal of the Crown of the Continent Research Learning Center (CCRLC).

The CCRLC serves Waterton-Glacier International Peace Park, Grant-Kohrs Ranch National Historic Site and Little Bighorn Battlefield National Monument.

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"Pikas" continued from pg. 1

Mexican high desert basin leaving rock pieces large enough to provide excellent pika habitat. They prefer these large rocks because they are poor diggers and thus vulnerable to predators such as weasels, foxes, coyotes and badgers. Talus provides natural crevices through which a pika can dart and hide. Talus fields also tend to accumulate soil slowly, inhibiting colonization of trees and large shrubs. Sparse, low vegetation leaves pikas with expansive viewsheds. Perched upon a large boulder, a pika can easily scan its surroundings for signs of danger.

I wish I had time to search these New Mexican talus patches for pikas. Few pikas have been seen this far south and when they do occur it is only at very high elevations. This desert shrubland sits at 7000 ft. It is extremely unlikely that I would find a pika this low and this far south. I still want to look though. The slim likelihood of finding a pika here despite the presence of their preferred habitat is puzzling. We find pika fossils here and further south



NPS Photo

Pika scat can reveal critical information about their physiology, health and diet, and studying offers a non-invasive way to increase our understanding of these easily stressed mammals.

and inland eastward in plains and valley bottoms, far removed from talus deposits. Pikas lived in these places as recently as 10,000 years ago. It is not unusual for an animal to change its distribution over the course of thousands of years, but pika range has shrunk dramatically, average elevation has risen sharply and by 7500 years ago they were pigeonholed into living only near mountains and talus. Pikas have tracked cool, moist environments since the last glaciation.

I see talus everywhere because I'm interested in finding pikas. Why do I care? In the past three years the number of scientists studying pikas has gone from a small handful to more than a dozen. Why do they care? The answer to these questions lies partially, but not entirely, with the mystery of their severe range constriction of the past. More recently, Erik Beever and others found that pikas had disappeared from 1/3 of surveyed sites they had occupied 30-50 years ago in the Great Basin of Nevada and Oregon. The most consistent similarity between the now pika-less sites: low elevation. All else equal, how are low elevation sites different from high elevation sites? They are warmer.

I am interested in pikas primarily because they are an indicator species. Pikas are a good indicator because, for one, they are easy to find. One needs only to search talus fields for haypiles and scat while listening and looking for them. They are solitary and defend home-ranges of 15-25 meters, so estimating the number occupying (and once occupying) a site can be done quite accurately. So they are not too difficult to count, what are they an indicator of? Scientists expect that pikas will be among the first mammals to respond to rising temperatures. The fossil record

Become a Featured Scientist

Each issue of "Science in the Crown" includes an article that highlights a different scientist or research project affiliate with the Crown of the Continent Ecosystem or Glacier National Park.

These articles are intended to help make current park science more visible and accessible to park staff, managers and the general public.

If you have a study you would like us to highlight, or know a scientist currently working in the park you think should be featured, please send an email to Paul_Ollig@nps.gov

supports this expectation and so do a number of physiological characteristics. Pikas have a high metabolic rate relative to their body size and thus must maintain a sweltering core body temperature of 104F; however, they cannot tolerate fevers higher than 109F. A pika's excellent furry insulation is critical during the winter because it reduces the dissipation of the heat their body generates. On a hot summer day it is a hindrance.

By studying how pikas respond to climate change, we gain insight into how other species may respond, informing land and resource managers and providing hard evidence to the general public about how our environmental impacts affect wildlife. The U.S. Fish and Wildlife Service is currently considering listing the American pika under the Endangered Species Act; the threat: rising temperatures. The verdict is expected in February of 2010.

How do pikas respond to rising temperatures? Firstly, I expect them to change their behavior. Pikas at

warmer sites should be less active than those at cooler sites during the hottest parts of the day. Heat-stressed pikas may begin to forage exclusively during the morning and evening, maybe even at night (but this last option exposes them to a much higher risk of predation). These pikas may take shorter trips above the cool talus and as a result their haypiles may be smaller than those built by their cool-site cousins. Secondly, I expect pikas to have higher survival rates and population densities at cooler sites. In addition to over-winter mortality caused by diminutive haypiles, heat-stressed pikas may experience immune suppression.

Of course, we cannot determine if what we find is typical or composes a change unless we have a point of comparison.

Since 2007, my team of outstanding assistants and I have covered more than 10,000 miles in Glacier NP, aiming to find appropriate talus habitats and then survey them for pika density. We also have more than 400 hours of behavioral observations from eight sites throughout the Park, chosen for their thermal characteristics; primarily aspect (south-facing is warmer than north-facing) and elevation. This extensive baseline data set will be used to produce

pika distribution models and made available to the NPS following the 2009 season, allowing future research to identify trends.

This research has been funded almost entirely by the Glacier National Park Fund. Special thanks to the Wheeler family for coming to the rescue this year when our housing for the summer literally went up in smoke.

Lucas is pursuing a Ph.D. in pikas at the University of Wisconsin Madison. He has conducted pika research at Glacier National Park since 2007.

Citizen Science Gets a New Look

By Tara Carolin

2009 marks our fifth year of loon monitoring and our second year of monitoring high country species and invasive plants through our Citizen Science Program. A wide-range of citizens helped to collect data on these species of concern, adding valuable information to the park's resource database.

Although members of the public are always encouraged to submit incidental wildlife observations... of species such as bears, mountain lions, harlequin ducks, porcupines, etc...to our visitor center staff, CCRLC's citizen science programs provide specific educational trainings on plant and wildlife observations to interested members of the public. Educational programs incorporate species identification tips as well as how to identify targeted species using safe, non-invasive observation methods. Targeted species include common loons, three high country animals (pikas, mountain goats, and Clark's

nutcrackers), and five noxious weeds...all species of concern in Glacier.

Citizen scientists with this training are sometimes referred to as wildlife observers or weed warriors. They are under no obligation to provide observation forms and are free to choose their own level of participation, including when and where they observe during their personal recreational visits to the park. This year we added a new form of Citizen Scientist, the VIP. These volunteers commit to work at least 80 hours during the field season and agree to work specific days at assigned locations within the park. Additional safety training is also provided as these folks sign up through the Volunteer-in-Parks program and are subject to all the same policies as park employees. This additional category of Citizen Scientist allows us to increase our coverage at some of



NPS Photo

the less popular field locations. In addition, we hired several student interns who dedicated part of their summer working for CCRLC, mainly on Citizen Science projects. The results of the dedication and hard work of all of our citizen scientists for each of our three programs is described within the following pages.

Weed Warriors in Action!

By Melissa Sladek

It's hard to believe another season has gone by in Glacier National Park. Lush carpets of wildflowers, thick stands of beargrass, and perfect seasonal temperatures all mark the events of this quintessential Montana summer. Ironically, just as the growing season was ideal for our native plants so too has it been for many of the non-native invasive plants plaguing our region.

The saying, "Ignorance is bliss" rings true for many things in life, and I would argue particularly so for noxious weeds, or highly invasive non-native plants. It seems the more knowledgeable one is in identifying noxious weeds, the more one sees them everywhere he or she goes. Fortunately for participants involved in the Non-native Invasive Plant Citizen Science program, all but 1% of Glacier's backcountry is free of noxious weeds, which makes hiking in the park a refreshing experience.

That said, identifying and documenting the noxious weeds

that do exist in Glacier is a critical component of keeping populations from spreading.

The Non-native Invasive Plant Citizen Science program began the spring of 2008 when funding was obtained from a Parks as Classroom grant to promote understanding and education of invasive plants and the resource management issues they create.

Since its beginnings, 52 people have attended educational programs in which they were given instruction on identifying five highly invasive noxious weed species, using GPS units to mark locations of weeds found in the field, and understanding strategies which these plants possess that not only make them successful but also a threat to our native plant communities.

Last year 81 survey forms, representing 56 different trails, were completed and added to the park's non-native invasive plant database. Sixty surveys have been



NPS Photo by Paul Ollig

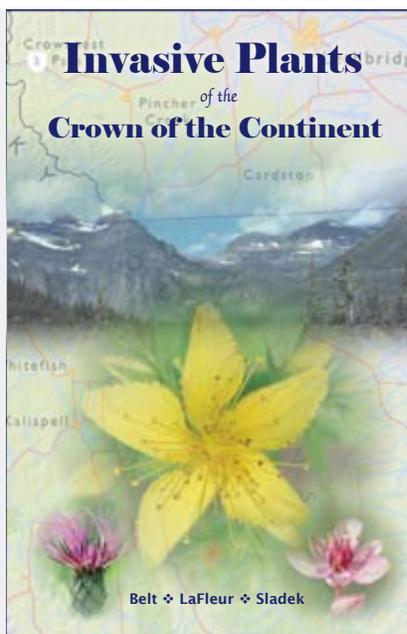
Glacier National Park's backcountry is a riot of color during the summer months. But invasive weeds are threatening the park's colorful meadows. Identifying and documenting noxious plants in the park is a critical component of protecting these beautiful scenes.

submitted so far this summer with the majority of noxious weeds found at the beginning of lower elevation trails or, in some cases, along waterways. Surveys are also completed by invasive plant crew members from Glacier's Integrated Pest Management team and other trained park staff but the numerous trails and one million acres that comprise Glacier National Park explain the benefit of using Citizen Scientists. The larger the area covered and the more times a section is surveyed, the better the picture of invasive

New Invasive Plant Field Guide!

Under the guise of the Crown Managers Partnership (CMP), the Crown of the Continent Research Learning Center worked with invasive plant managers throughout the region to produce the "Invasive Plants of the Crown of the Continent" field guide.

The field guide highlights 42 highly invasive species that currently threaten our region. An additional 21 "Weeds to Watch For" are also briefly featured in the guide. Limited copies are available for free. Call 406-888-7986 for more information.



plants within the park. The data collected allows biologists to map where specific noxious weeds are found throughout the park and use the findings to make management decisions on when and where to treat invasive populations.

Knowing where noxious weeds exist within the park is just one goal of the Non-native Invasive Plant Citizen Science program. This program reaches beyond Glacier's borders as well.

Arming participants with the knowledge and tools to identify invasive plants in our area allows them to make a difference at home, in their community, or in other public lands. Participants receive background information and identification tips during the education program and are given invasive plant field guides to assist in identification here and at home.

This year Citizen Scientists were given a new educational tool. The newly created invasive plant field guide, *Invasive Plants of the Crown of the Continent*, features 42 non-native invasive plant species in the Crown of the Continent eco-region, a 16,000 square mile landmass stretching between British Columbia, Alberta, and Montana. The field guide was produced by the Crown of the Continent Research Learning Center (CCRLC) under the guise of the Crown Managers Partnership, a group of resource managers from Alberta, B.C., and Montana that work together on managing this pristine eco-region. CCRLC worked with invasive plant managers throughout the region to produce the field guide. It includes native look-alike plants for the 42 featured weeds and brief descriptions for 21 "Weeds to Watch For." Suggestions for manual treatment are also included.

As the coordinator of this Citizen Science program, the most rewarding part of my job is hearing Citizen Scientists tell me how helpful the information and resources are that they receive from us. They are excited to put their new tools and knowledge to use. For invasive plant managers around the Crown, this is one of the primary benefits of a program such as ours...for they agree that the key to limiting the spread of invasive plants is prevention, and the first step to prevention is education. By providing our participants with the tools to battle noxious weeds at their homes and within their communities, we are helping accomplish this first step.

Although seeing noxious weeds can be disheartening, the role Citizen Scientists play in documenting

and controlling invasive plants does make a difference. Whether filling out surveys for weeds found in the park or attacking the knapweed in their yard, I am proud of our Weed Warriors and the part they play in preventing the spread of invasive plants in this amazing place we call home.

To view a PowerPoint presentation about mapping non-native invasive plants in Glacier National Park, visit:

http://www/nps.gov/glac/naturescience/ccrlc-citizen-science_weeds.htm

For more information on this Citizen Science project, call 406-888-7986.

Become a Citizen Scientist

The CCRLC is looking for dedicated individuals who wish to assist with our research efforts as wildlife observers and citizen scientists. Participation in the program requires attending a 3-8 hour training session (depending on the project) and signing up as a park volunteer. Current citizen science projects include:

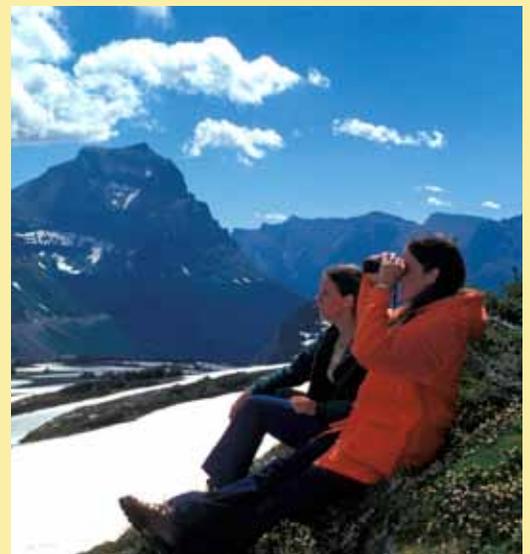
Common Loon Monitoring: Survey Glacier National Park's hundreds of lakes to document presence of Common Loons and breeding and nesting behaviors.

High Country: Collect data on the number and distribution of three species of concern for Glacier National Park: mountain goats, pikas, and Clark's Nutcrackers.

Noxious Weed Mapping: Survey Glacier National Park's 700+

miles of hiking trails to determine the distribution and extent of noxious weeds invading the park.

For more information, please contact Citizen Science Coordinator Jami Belt (jami_belt@nps.gov).



NPS Photo

Monitoring Common Loons

By Melissa Peterson and Susan Sindt

As Glacier National Park nears its centennial, we can feel proud that legislators and citizens alike have worked toward fulfilling the National Park Service's mission. Part of determining the health of our wilderness is knowing the status of our wildlife populations. Though over the years occasional sightings have been submitted to resource managers, it is only recently that organized monitoring protocols have been established and followed. In the case of the wilderness icon, the Common Loon, the state of Montana began making statewide population estimates by the establishment of Loon Day in 1986. Loon Day is a set day in July when employees and volunteers head out to as many loon lakes as possible and ascertain the status of loons for each.

Glacier has been contributing to Loon Day since 1988. Analysis of the data collected in this annual survey indicates a lower reproductive rate for pairs in the park, although the park harbors approximately 20% of Montana's breeding pairs. There is evidence that loons are adversely impacted by human disturbance at nest and nursery sites, and consequently, this species is listed as a Montana Species of Special Concern.

With the establishment of the Common Loon Citizen Science project in 2005 within the Crown of the Continent Research Learning Center, the number of observers collecting data on Loon Day has increased. Extending the survey period has provided new information documenting nest site locations, hatch dates and rearing information, reproductive success, and migration patterns.



NPS Photo

By improving the accuracy of observation reports and increasing coverage of lakes supporting loons throughout the nesting season, we hope to gather season-long information to gain a better estimate of the health of Glacier National Park's loon population. We also hope to use the data to begin to identify factors affecting nesting success.

The Common Loon Citizen Science project educates park staff and volunteers on identification and observation techniques when surveying for loons in hopes of increasing our understanding of this species. Funding for this program was made possible through the Glacier

National Park Fund and Glacier National Park Associates, partners to Glacier National Park.

To view a PowerPoint presentation about loon monitoring in Glacier National Park, go to http://www.nps.gov/glac/naturescience/ccrlc-citizen-science_loons.htm. For more information, call 406-888-7986.

Season-long Surveys Create a More Reliable Dataset

The 2008 season-long estimate was 47 adults (including 14 pairs) and 6 chicks. This is a substantial difference from the 2008 Loon Day estimate of 29 adults (including 12 pairs) and 4 chicks. Since Montana only has an overall average state population of about 35 chicks per year, documenting chick production and loss is a critical factor in determining nesting success rates.

In 2008 an additional 2 chicks were detected through season-long monitoring; in 2007, 4 additional chicks were detected, while loss of chicks was documented in 2005 and 2006.

High Country Citizen Science Recap

By Jami Belt

Collecting data on alpine species doesn't come without challenges. Take this year's Goat Days for example. Planned for mid-August to take advantage of the usually sunny, dry August days, 2009's Goat Days was marked with rain, fog, and yes... even snow! This unusually inclement August weather didn't deter high country citizen scientists from heading to the park and attempting surveys. But, fog and rain clouded most viewsheds, causing the normal survey period to extend from three days to a week (August 14-23). This extension allowed for sites with limited visibility to be resurveyed.

During the week, 138 mountain goats were observed at 36 of the 37 official survey sites and an additional 65 goats were seen outside of survey sites. All official sites were surveyed except Cut Bank, closed due to bears, and Grace Lake, which lacked visibility due to fog. Even with the wintry August weather, 34 citizen scientists participated and contributed 548 hours of their time.

In addition to ground surveys, aerial surveys were completed on August 18 and 19. During these surveys, 248 mountain goats were seen at 11 of the 37 survey plots. Fourteen additional goats were seen outside of survey plots. This data is currently being analyzed to compare which goats seen from the air were located within viewsheds that could be seen from the ground. This allows for comparisons of sightability between air and ground survey methods.

Although tallies of the total number of surveys, hours, and observations for the 2009 High Country Citizen Science season has not yet been tabulated, the second year of monitoring high country wildlife species of concern... mountain goats,

Clark's nutcracker's, and pikas... was a huge success.

Forty-four new citizen scientists were trained, bringing the total of trained participants in 2009 to 88. By mid-September, these participants submitted a total of 272 mountain goat surveys from official sites and 58 pika surveys. Additionally, observers discovered 16 new pika sites (14 with pikas currently present) and surveyed these along with 42 previously known sites. And lastly, the numerous volunteer hours spent on High Country Citizen Science includes at least 36 observations of one or more Clark's nutcrackers. More surveys were completed this fall and will be added to these totals.

Thanks to all our hardened volunteers for braving the elements and taking the time to observe and report on these high country species of concern. The

information gathered gives us baseline data for species whose habitat may be adversely impacted by climate change in the years to come.

A special thank you to the Glacier National Park Fund for their continued financial support of this project.

To view a PowerPoint presentation about loon monitoring in Glacier National Park, visit:

http://www.nps.gov/glac/naturescience/ccrlc-citizen-science_hc.htm

For more information on this citizen science project, call 406-888-7986.



NPS Photo

Looking for goats from a helicopter on Goat Days helps us "groundtruth" the data collected by our volunteers in the field, giving a holistic view of where goats are hanging out in the park over a single weekend.

The Adventures of a Citizen Science Intern

By Caroline Walls

When Clare and I received our instructions to stay in the patrol cabin at Harrison Lake to do a goat and loon survey we did what we always do when we are told where we are going next: immediately check the bulletin board to see exactly how far we had to hike. According to the sheet we had two options: hike 13 miles along the boundary trail starting at headquarters, or ford the Middle Fork of the Flathead and hike only 5.5 miles. For me the choice was clear. We were, of course, going to take the shorter route. I had never forded a river before, but was positive that I could handle a little water. Clare, however, who had had the good fortune of fording the Belly River earlier in the summer, knew exactly what it entailed and was therefore a little hesitant. My confidence reassured her though and I managed to convince her that fording was the way to go.

When we got to the river I was still perfectly confident that we could handle anything; but after seeing how high and fast the water was moving, Clare became even more nervous. Luckily, however, we met a father and son standing by the lakeside who were debating whether or not they thought it wise to attempt to cross. They were very experienced hikers and had forded the Middle Fork several times over the years; however they were still unsure if they could handle the water today. They determined that we couldn't pass it with just a two-person chain, but if we joined together to make a four-person chain, we should be okay. This seemed to make Clare feel much better (I, having no idea what it was like to ford, was perfectly confident either way).

As soon as we entered the water, however, I immediately realized what all the fuss had been about. The tables were completely turned: I began to panic, while the other three seemed perfectly calm and confident. You just don't realize how powerful a river is until you are waist-deep in rushing water, trying to balance across large, slippery rocks. Needless to say, I did NOT enjoy my first fording experience. Despite the fact that I was sincerely shaken up, we all managed to make it across the river in one piece.

Once we got started, the rest of the trip onto Harrison Lake went very smoothly. As we were walking, Clare and I discussed what we always end up discussing when we are working: we have the best summer jobs in the world. We both spent our summer working with the Research Learning Center as Citizen Science Volunteers. So while neither of us is actually paid- except in class credit- there is still nowhere else we would rather be. As Citizen Scientists we go to designated sites in the park and conduct surveys for mountain goats, pikas, loons, and/or invasive weeds. Luckily, there are survey sites all over the park, giving us the chance to see much more of Glacier than most people get to see in one summer. Already I have seen and done so many things that I never would have one my own.

The hike to Harrison was beautiful (as they all are). The trail seemed very seldom used and it ended up going through some old homesteads littered with a couple of very old, abandoned (and creepy) tractors and plows. There were plenty of ripe huckleberry and thimbleberry bushes along the

way, which we of course snacked on. We were also lucky enough to see three large Great Grey Owls along the trail.

We reached the Patrol Cabin around 1:00 pm and dropped our packs off so we could do our surveys. Unfortunately we did not see any goats, but we did see one loon. We finished our surveys at around 3:00 and decided that it was early enough that we could simply head home instead of staying the night in the cabin, and face the infamous mice that we were told would be roaming about all night long. However, when we got back to the cabin to pick up our stuff we got caught up in how cool the cabin actually was. Anyone who has ever stayed in a Patrol Cabin can attest to how much history they possess. One of the cabinets in the cabin was covered with the names and short messages of what seemed to be everyone who had ever stayed there. One of our favorites: "UFO Sighting (Good Colors) –Bob Marshall, Dogman, Joe O'Neill". We also found the log book and read several entries, adding our own story to the end.

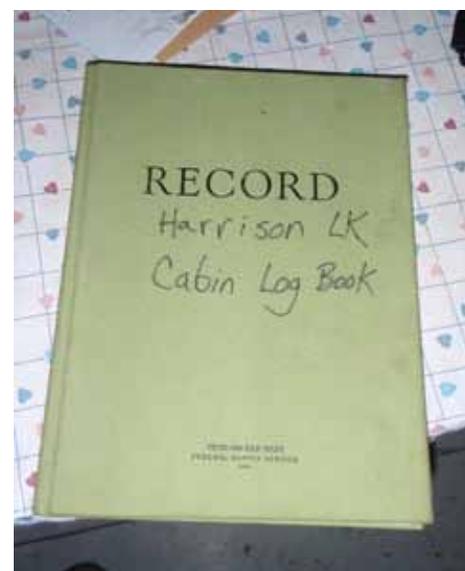


Photo by Caroline Walls

When all was said and done at the cabin, it was already 5pm, but for some reason we still had it in our heads that we were going to head home that night. We figured that it doesn't usually get dark until 10, so we still had plenty of time to make it back. We even started our trip at a very leisurely pace, stopping many times to pick berries and take pictures. What we did not account for, however, were that (a) thunderstorms tend to hit in the evening, and (b) it gets dark much earlier when you are in a densely forested valley.

We first started to notice our error in judgment around 7:45 when we realized that we could no longer see the sun and that the dark cloud looming over our heads was starting to let a few fat drops fall. We still had about 1.5 miles to go and a river to ford (this time by ourselves), which I was considerably more nervous about the second time around. At this point, we decided that it was about time to pick up our pace. We practically ran the rest of the way, passing by all of the delicious berries and ignoring all of the thorny bushes that were cutting up our legs. Neither of us is naturally very graceful, so our new speed inevitably caused us both to trip and fall to the ground several times along the way.

It was 8:30 by the time we reached the river. It was uncomfortably dark, and a very large thunderstorm lay directly over our heads; not to mention the fact that nobody knew where we were or what we were about to do because we weren't expected home for another 24 hours. Fortunately, we were able to contact park dispatch and inform them of both our change of plans and the fact we were going to attempt fording the river, again.



Photo by Caroline Walls

CCRLC Interns Claire and Caroline enjoy a damp hike to Harrison Lake to conduct goat surveys for the citizen science program.

Our conditions were significantly less than ideal for fording the river this time. But we decided there was not much else we could do; our only other option was to walk six more miles in the rain and dark back to park headquarters.

I was terrified thinking of how unsettling it was the first time, and knowing it could only be worse this time. Clare was scared too, but devised a plan to get across by ourselves: we would link arms, walking side-by-side to the middle, and then face each other, interlocking both of our arms to cross the second half, which was much deeper.

As we started to cross we heard lightning bolts crashing all around us and knew we needed to get through as fast as possible, but there was no way to move fast without losing our balance. Just before we reached the middle I slipped on a rock and almost brought us both down. We took a second to steady

ourselves; but a second was all we had, because at that moment the wind picked up and rain started to pour down. I wasn't ready to go yet, but Clare told me I had no choice, we had to move.

After what seemed like an eternity, Clare announced that we had just one more step to go before we were at the shore. We hit dry land and practically collapsed on the rocks. As we looked back at what we had just crossed both of our hearts were pounding and hands were shaking. We took a second to take a picture of the river, but just then another lightning bolt boomed over our heads we decided it was time to climb up the rocks and get as far away from the river as possible.

Needless to say, next time we will simply follow the plan and face the mice.

Caroline is an undergraduate student at Northwestern University.

Glacier's George C. Ruhle Library Gets a New Librarian!

By Sheree West

Oreos and Milk...
Peanut Butter and Jelly...
the CCRLC and its Library!

Sometimes when good things are paired together, the combination is even better than the sum total of its parts. Case in point; the Research Learning Center and the George C. Ruhle Library.

You already know that the goals of the Learning Center include the support of science-informed decision making and providing access to research knowledge, right? What you may not know is that the Learning Center maintains a research library specifically to support its goals.

Actually, the library at Glacier National Park has been around since 1943, when its purpose was to serve as a repository for printed materials relating to the park, and to aid the park naturalists of the time in developing displays and tours for visitors. The library was named for legendary Glacier naturalist George "Doc" Ruhle, who worked here from 1929 to 1940, and who quite literally put many of your favorite GNP features on the map, having named more than a hundred mountains and lakes. Doc collected an impressive number of Glacier publications over the years, and his own professional library forms the core of the rare books collection of the library named in his honor.

Today, the Ruhle Library supports the efforts of all park employees, researchers and park partners by providing them with information resources vital to the success of their work. When an interpreter is

looking for the results of research done on the North Fork of the Flathead River to illustrate to park visitors just how water is an important resource, she contacts the library. When a researcher needs to know what studies are showing about bull trout in the Park to guide his current work, the library can send the relevant files electronically right to him, whether



NPS Photo
Glacier National Park librarian, Sheree West.

he's at Glacier or at a university across the country. And when a park biologist needs a publication that isn't available here, the librarian locates it wherever in the world it may be, and sends it directly to that park resource manager.

Since the library is all about the right information going to the people who need it in a timely manner, it may come as no surprise that there has to be a human being

in the middle, driving it all. It's not enough for the park to just collect a library full of information: If that information isn't used, it might as well not exist. And though powerful information-finding tools are now freely available to all of us, sometimes even those tools aren't adequate: We all love Google, but it's important to understand when the best information just isn't there. When you're talking about research done at Glacier National Park, it's not unusual that the necessary document may exist only in the files at a university, and in the Ruhle Library's collection.

There's an expert involved in finding the specific information needed to fit each particular need: Whether you call her a librarian or an information manager or information professional, Ruhle Library's Sheree West is here to get the job done. With a background in the biological sciences followed up by a Master of Library and Information Science from the University of Washington-Seattle, Sheree is committed to bringing research information to bear on resource stewardship.

In addition to its historic goal of being a 'safe deposit' for GNP publications, today the George C. Ruhle Library facilitates research in the park, and is a resource for employees and park partners in developing science-informed management policies & practices, and in getting the word out about current research findings. If these goals sound familiar to you, it should make perfect sense why the Learning Center has its very own research library, and its very own librarian!

Science ON the Crown



NPS Photo by Paul Ollig

Science in the crown can sometimes mean science ON the crown, as demonstrated by Glacier National Park biological technicians Jen Asebrook and Jen Hintz, who spent many days last summer on the tops of mountains for the 2009 GLORIA (Global Observation Research Initiative in Alpine Environments) survey on the summit of Pitamakan Peak. Here they examine alpine vegetation in one plot on the summit of Pitamakan Peak.

Crown of the Continent Research Learning Center

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Crown of the Continent Research Learning Center

Goals and Mission:

- *Facilitate use of parks for scientific inquiry;*
- *Support science-informed decision-making;*
- *Communicate relevance and provide access to research knowledge; and,*
- *Promote resource stewardship through partnerships*

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