



## 2024 Citizen Science Final Report

### Program Overview

Since 2006, the Citizen Science Program at Glacier National Park has collected valuable data on emblematic wildlife species that call the park home. Armed with binoculars and spotting scopes, volunteers from the local community and beyond, travel to every corner of the park to collect data on focal species. Public participation in these research projects significantly increases the capacity of park biologists to monitor wildlife and strengthens community engagement in conservation in Glacier. Studies show that large numbers of volunteers can cover more ground than a small team of biologists while collecting data of comparable quality. While ours was one of the first, there are a growing number of active citizen science projects in the National Park Service (NPS); visit the [NPS Citizen Science webpage](#) to read more about the contributions of citizen scientists in parks.

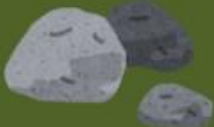
The Glacier National Park Citizen Science Program runs three long-term studies, hosts bioblitzes and supports collaborative research. We collect population and nesting data on Common Loons (*Gavia immer*), population trend and distribution of mountain goats (*Oreamnos americanus*) and bighorn sheep (*Ovis canadensis*), and document migrating raptors, especially Golden Eagles (*Aquila chrysaetos*). A two-year research collaboration on American pikas (*Ochotona princeps*) was also recently completed.

### Program Objectives

1. Conduct surveys for long-term population monitoring.
2. Engage public in conservation goals and collecting data for management uses.
3. Empower Glacier science allies and outdoor recreationists to collect high quality data by hosting one-day trainings on focal species biology, survey techniques and data collection apps.
4. Identify important habitat for loons, pikas, goats, raptors and other indicator species.
5. Collect quality data to use for monitoring population status.



Top: A mountain goat observed near Gunsight Pass (Leanne Gentry). Center: A loon chick rides on the back of its parent (Jeff Jones). Bottom: Pika leaps over small water flow (Jeff Jones).

|              | VOLUNTEER HOURS                                                                            | PARTICIPANTS                                                                             | VALUE OF DONATED TIME |
|--------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------|
| COMMON LOON  | <br>3,333 | <br>80 | \$<br>111,622         |
| HIGH COUNTRY | <br>3,526 | <br>90 | \$<br>118,086         |
| PIKA PATROL  | <br>913   | <br>30 | \$<br>30,561          |

| TRAINING EVENTS HOSTED                                                              |                                                                                     |                                                                                     |                                                                                      |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| COMMON LOON                                                                         | HIGH COUNTRY                                                                        | PIKA PATROL                                                                         | HAWK WATCH                                                                           | VOLUNTEERS IN PARKS PROGRAM                                                           |
|  |  |  |  |  |
| 4                                                                                   | 3                                                                                   | 2                                                                                   | 2                                                                                    | 5                                                                                     |



Images from left to right: Left: A group conducting a loon survey during training (Dee Baginski). Middle: Dr. Lucas Moyer-Horner kneeling next to a pika haypile (Julie Merluccio) . Right: Biologist Jami Belt showing volunteers how to take a photo through a spotting scope (Julie Merluccio).



Jeff Jones

### Common Loon Citizen Science



A pair of Common Loons swimming on a lake in Glacier National Park (Chris Peterson).

Glacier National Park founded the Common Loon Citizen Science Project as its first citizen science effort. Common Loons, with their striking plumage and haunting calls, are the perfect candidate for long-term monitoring. They have strong site loyalty and often return to the same breeding lake every year, and both parents stay at the lake once their young have hatched to perform chick rearing duties. Loons are sensitive to habitat changes both on the lake and along the shoreline because they are highly adapted to life on the water and nest close to the water’s edge due to their inability to maneuver on land. The long-term population data set acquired through these surveys provides a baseline for changes in their population and a record of long-term lake inhabitance, nest

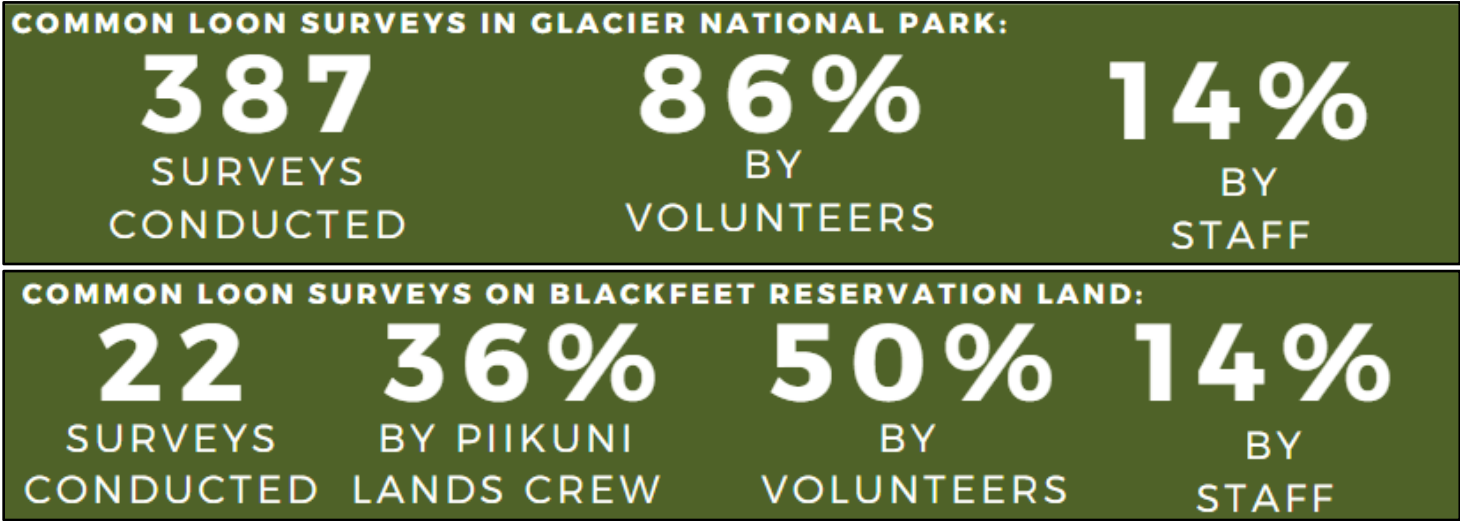


Biologist Jami Belt conducts a loon survey from a pack raft on a lake in Glacier National Park (Dee Baginski).

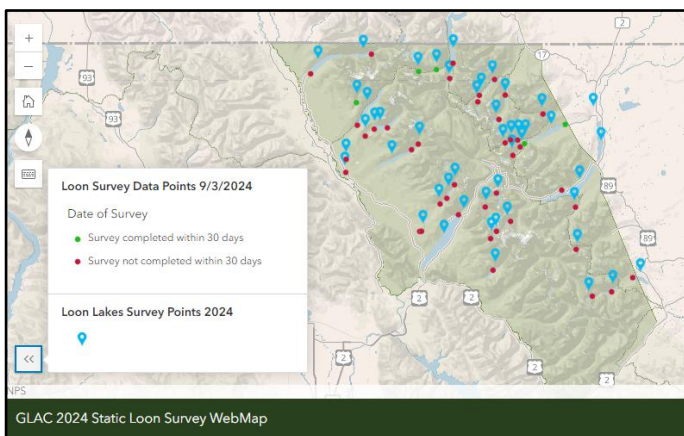
success and chick production. To learn more about loons in Glacier National Park check out our [Loons on the Edge StoryMap](#).

#### Common Loons in Glacier National Park

Common Loons are often seen as an indicator of true wilderness. They have specific habitat needs and preferences and are easily displaced due to human disturbance, environmental pollutants and habitat loss. Glacier National Park’s pristine lakes are vital habitat that support roughly 20 percent of the chicks hatched across the state each year. Montana contains the largest population of Common Loons west of the Continental Divide, but it is the eastern edge of their range where they are most vulnerable. Only about 40-50 chicks are hatched in the entire state each year.



Collaborative management efforts involving many agencies throughout the state provide critical data for monitoring and managing loon population health. The annual “Loon Days” is a statewide effort where staff and volunteers survey as many lakes with sufficient loon habitat as they can in a single weekend. This effort provides a snapshot of breeding success at each lake. In addition, we conduct surveys throughout the breeding season to provide more of an understanding of the resident population at each individual breeding lake.



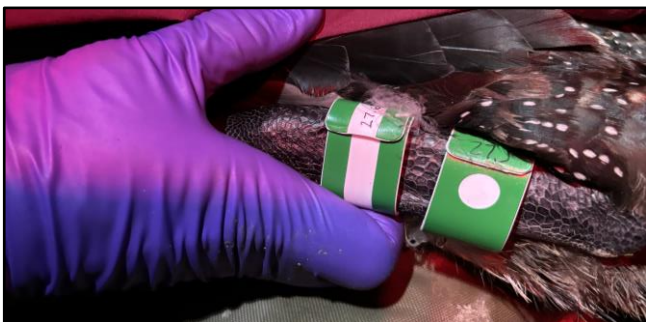
## Survey Methods

Screen shot of the loon static WebMap in Arc GIS Online. Red dots indicate site has not been surveyed in 30 days and needs to be surveyed. Green dots indicate site has been surveyed recently.

Each spring, we train Citizen Science volunteers on Common Loon ecology, identification, and survey methods. Trained volunteers then make their way to the 46 loon lakes in the park and conduct one-hour surveys. In early spring volunteers search for loon pairs displaying nesting behaviors. As breeding season continues into summer observers look for loons incubating their nests. During the next month, eggs begin to hatch, and the search begins for each of the tiny and cryptic chicks so we can document hatch dates and nest failures. We continue monitoring into late summer to document chick survival and determine the status of each lake. When deciding where to survey volunteers referred to a new web map developed this year that shows all survey locations. When the survey location is green it has been surveyed recently, when it is red the location needs to be surveyed. Additional information can be found on the [Common Loon Citizen Science project](#) page.

## 2024 Loon Banding Effort

Biologist showing the banded leg of a loon (Lauren Michelson).



Capturing loons to place distinctively colored bands on their legs allows for identification of individual birds from a distance and a health assessment. It can give us more information about dispersal, site and mate fidelity, age, and pollutants affecting Common Loons. When volunteers report resighting of banded loons it gives researchers insight into the movement patterns of specific individuals.

The 2024 banding effort was led by biologists Jami Belt from Glacier National Park and Carl Brown from the Biodiversity Research Institute. Banding was attempted on four lakes across Northwest Montana and one very large male loon was successfully banded. This year due to the full moon cycle and the timing of the loon life cycle, only one week of banding was possible. It was also the first year that there was an attempt to band at a lake that required a long-distance hike into the backcountry and significant time investment.



Common Loon Banding effort Glacier National Park (Jami Belt).

## 2024 Nesting Highlights



Two adult loons nest building on a lake shore (Lorette Debaise).

In 2024 most of the successful nesting occurred in the North Fork section of the park, however there was an exciting nesting attempt in the Belly River region. The last recorded attempt in this region was in 2008. This nest was a thrilling discovery by wildlife technician Eric Godin but was determined to be unsuccessful during later re-visits by volunteers. Other nesting attempts included Swiftcurrent and Lower Quartz which both appeared to have failed due to flooding. Hidden Meadow did not attempt to

nest this year and the loons were seldom seen on the lake during the breeding season. Other lakes that have nested in the past, but didn't this year include Logging, Trout, and Harrison. Three breeding adults were spotted on both Trout and Harrison for Loon Days. It is unclear why these pairs did not attempt to nest this year.



Wildlife Technician Cienna Semsak deploying recreational area closure buoys around the Swiftcurrent Lake loon nest (Dee Baginski).

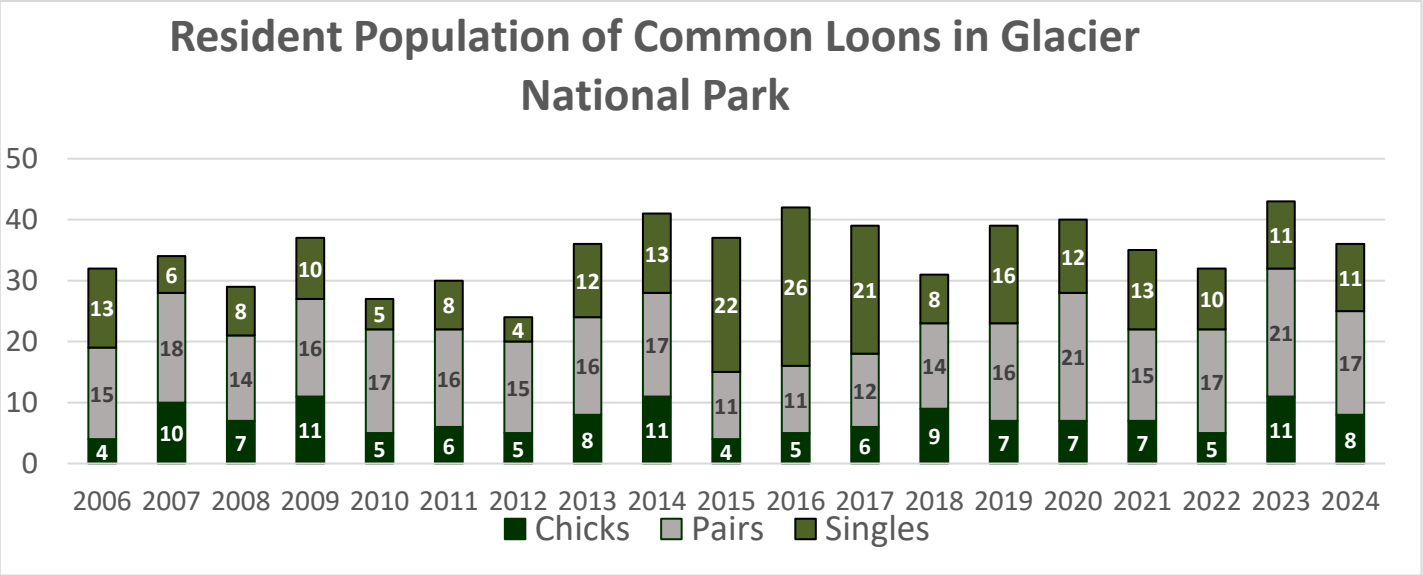
Results

In 2024 eight chicks, also called loonlets, hatched throughout Glacier National Park in four broods. On Blackfoot Tribal Lands there were four loonlets hatched in three broods. Volunteers conducted atleast three surveys at the priority one, two and three breeding lakes in the park. Priority one is defined as lakes where nesting occurred or was attempted in the last five years (e.g., detection of brood or nesting behavior). Priorities two and three are lakes where nesting has occurred historically, or a pair has occupied a lake during breeding season in the last five years. The graph below illustrates the resident loon populations from 2006 to 2024. Resident populations are determined by repeating surveys at the same breeding lakes every year, including data from the annual Loons Days event. This data helps biologists observe trends in the population.

**Using Population data to inform Management**  
Information collected from loon surveys plays a vital role in park management decisions. Having long-term population data allows biologists to strategize recreation management and infrastructure development and maintenance to minimize nest disturbance. It also provides context and nesting history of each lake. This year buoys were placed around the nest at Swiftcurrent Lake, a very popular lake for recreation. The Citizen Science Team worked with Glacier Park Boat Company to monitor the closure and educate visitors about the sensitivity of loons. NPS Rangers also placed trail closures at Swiftcurrent and Lower Quartz to minimize disturbance for nesting loons.



Resident Common Loons in Glacier National Park from 2006-2024.





## High Country Citizen Science

Mountain goats are a uniquely adapted ungulate (hoofed mammal) found only in the northern latitudes of North America. Glacier National Park provides exceptional opportunities for its visitors to view this iconic species, as the park hosts the largest native population of mountain goats in the lower 48 States. Over the last few decades, wildlife managers in Montana began documenting a concerning decline in goat population counts in the park and in adjacent lands in the National Forest.

Park biologists decided that a long-term population monitoring program was necessary to understand the population trends, distribution, and threats to mountain goats in Glacier National Park. The High Country Citizen Science Project was established in 2008 to employ the power of citizen scientists to monitor mountain goats in their high elevation habitats. Mountain goats are highly specialized to alpine ecosystems which are threatened by climate change, and altered wildfire regimes and invasive plant intrusion. Additionally, rapidly increasing recreation in once secluded goat haunts has led to increased habituation and changes in goat behavior. We also monitor bighorn sheep, which are found primarily on the east side of the park and often share habitat with mountain goats. Sheep are also monitored through this program to track changes in their use of the habitats they share with goats. Additional information about the project can be found on the [High Country Citizen Science project page](#).

### Project Objectives

- 1) Enlist the help of volunteers to collect baseline information about mountain goats at sites across the park.
- 2) Monitor changes in population size of goats over time
- 3) Map park-wide distribution of mountain goats.
- 4) Document areas where bighorn sheep may overlap with goats and monitor changes in shared habitat use over time.
- 5) Collaborate with USGS to map genetic diversity and genetic structure of mountain goats.

### Survey Methods

Volunteers survey 37 sites distributed throughout the park, some involving short hikes of a few miles round trip, while other sites are more than 20 miles into the backcountry. The goal is to get at least three surveys completed at each site between June to October, the period between birthing season and mating season (aka "the rut"). Surveyors navigate to pre-designated observation points then use binoculars and spotting scopes to sweep the mountainsides for goats and sheep for one hour. They record any goat or sheep detections, along with information about the habitat, location, ages, and sexes of the individuals in the group.



A citizen scientist conducting a survey at Scenic Point (Cynthia Dearing).

## MOUNTAIN GOAT AND BIGHORN SHEEP SURVEYS:

# 251

SURVEYS  
CONDUCTED

# 95%

BY  
VOLUNTEERS

# 5%

BY  
NPS STAFF

# 3,814

MILES  
HIKED

### Mobile Data Collection

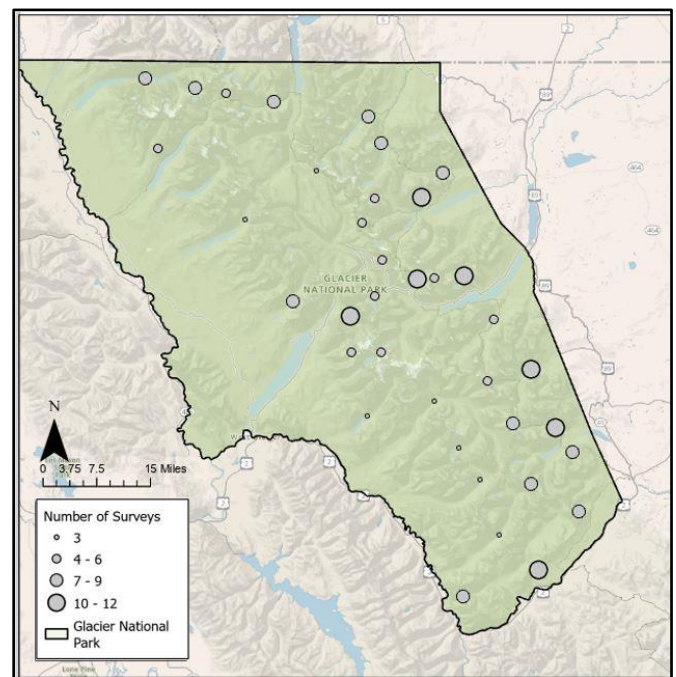
Mapping apps are an essential tool we use to collect and share Citizen Science data in Glacier National Park. In 2024, all surveys were conducted on Survey123, a mobile mapping app that greatly increases the program's efficiency and capacity by allowing project coordinators to immediately review surveys and access data. Survey data is immediately linked to a publicly available webmap that allows our volunteers to see when and where surveys have been completed so they can focus their efforts on sites that have not had surveys recently. Our innovative use of mobile Geographical Information Systems (GIS) forms for Citizen Science goat monitoring was recognized by the NPS Geospatial Committee in July. [Click here to learn more.](#)

### Results

This year, volunteers were able to conduct three or more surveys at every site, with some sites surveyed as many as twelve times. Many metrics can be drawn from this observational data. A high count is the maximum number of goats and sheep observed at each survey site during the official one-hour survey period. High counts can be used to estimate the minimum population size and density of mountain goats in the park as well as track changes in these factors over time. In 2024, goats or sheep were observed in 52% of surveys, either during the survey period or while hiking to and from the survey site. The highest number of goats observed during a survey occurred at Beaver Woman Lake with 20 individuals, while the highest number of sheep seen during a survey occurred at Apikuni Falls with 24 individuals. The reason for such a high count at Beaver Woman Lake may be due to the presence of a "salt lick" where goats congregate to get

important minerals. This underscores the importance of getting volunteers to conduct surveys at all sites, even sites such as Beaver Woman that is a remote site that is difficult to access (24.5 miles from the nearest trailhead).

Volunteers and park staff also collected 20 goat pellet samples in 2024 to fill in gaps from the 2021-2023 genetic sampling effort. Results from the genetic analysis will be compiled and shared in 2025.



Map displaying the 37 survey sites. Point size is proportional to the number of surveys completed at each site.



**HIGH COUNT OF  
GOATS: 165**



**HIGH COUNT OF  
SHEEP: 120**

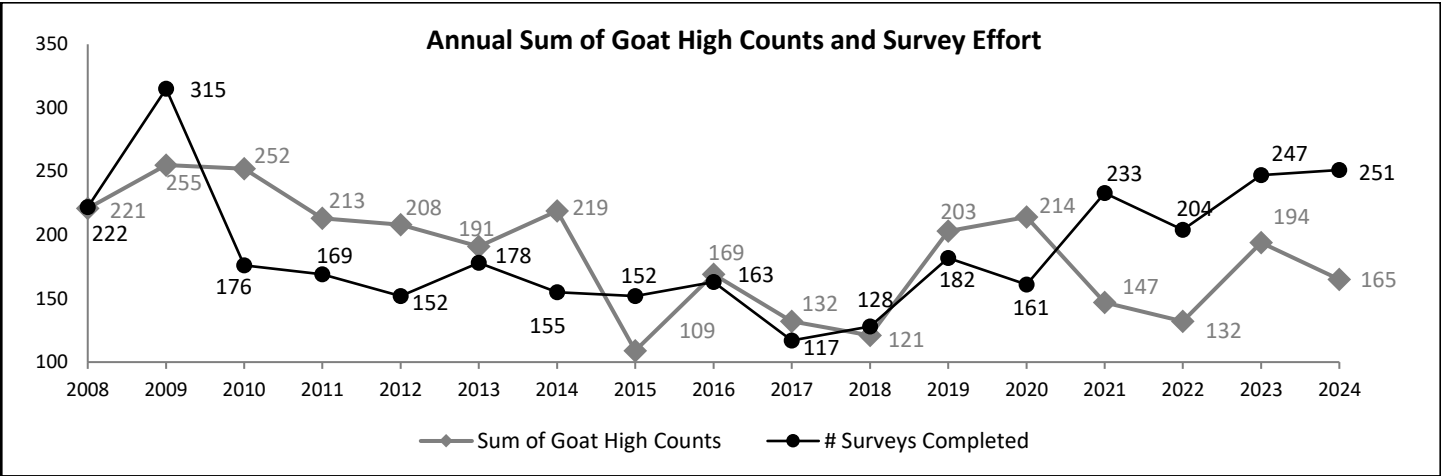


**150+  
OBSERVATIONS OF  
OTHER WILDLIFE**

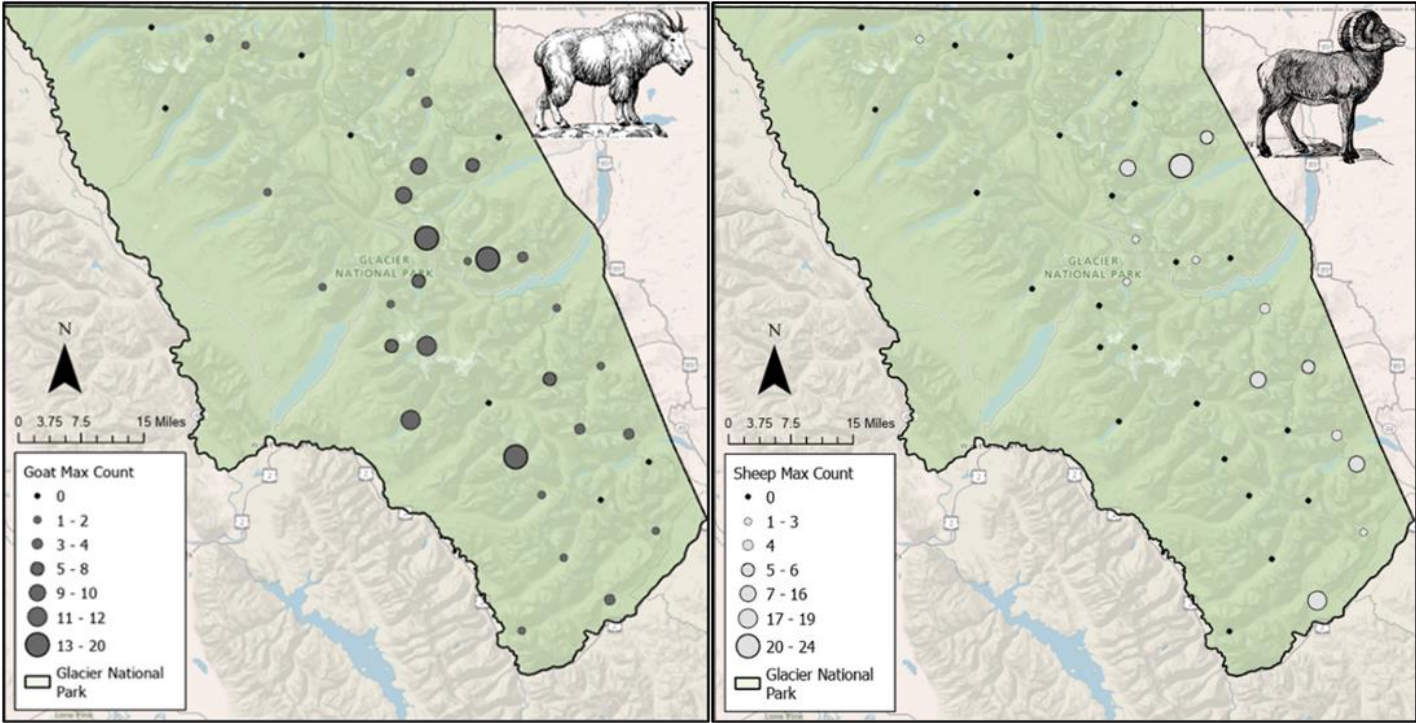
Goat and Sheep High Counts

The sum of goat high counts was 165 individuals. The sum of sheep high counts was 120 individuals. Observers also noted over 150 instances of other wildlife detections during surveys or during their travels to and from the observation points. These

sightings included 23 species of birds, 19 species of mammals, one toad species and one fish species. A few notable species observed are White-tailed Ptarmigan, Golden Eagle, Clark’s Nutcracker, Black Swift, wolverine, lynx, pine marten and cutthroat trout.



Sum of all goat high counts across the park shown for each year the project has run alongside the total number of surveys conducted in that year.



Maps displaying the distribution of mountain goat and big horn sheep high counts at each of the 37 survey sites. Point size is proportional to the max count of goats or sheep observed.



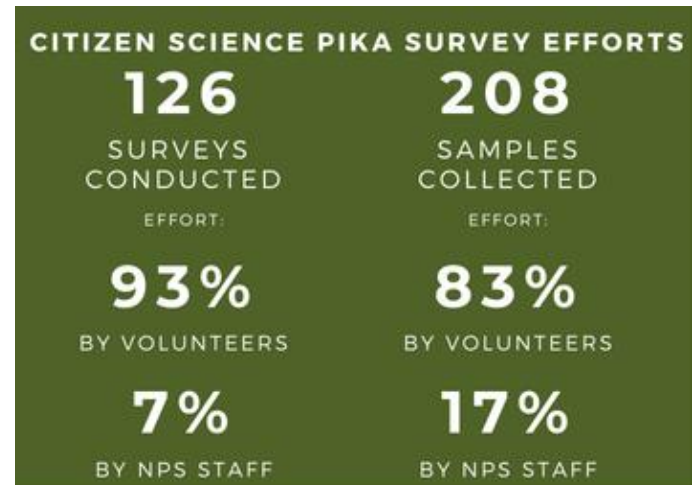
## Pika Citizen Science

The American Pika is an alpine species that is physiologically adapted to thrive in cold climates in talus slopes, or boulder fields, on the side of cliffs or mountains. Unlike other small alpine mammals, they do not hibernate over the winter. Instead, they are actively feeding within the talus all winter. Their furry coats and high metabolisms maintain their body temperature at 104°F. During the winter these attributes are crucial to survival but they can be a detriment during the summer which is their most active time as they store haypiles in preparation for winter. Pika's experience fatal overheating when their body temperatures reach 109°F. They cannot be active for long at surface temperatures above 75°F. With warming temperatures in the summer, park managers are concerned that pika populations might decline. Early snow melt is also a concern as it leads to a premature loss of the insulative snow blanket that pikas use as part of their winter cold survival strategy.



A pika stands in a talus field/boulder field (NPS).

Surprisingly, pika are not rodents but lagomorphs which means their closest relatives are rabbits. Looking closely, their bodies resemble compact rabbits with short ears. Pika have powerful back legs that help them jump through the talus and navigate to food sources in uneven environments. They are territorial, mostly solitary, and defend a "home range" within a talus field. Each home range is approximately the size of a tennis court and contains the larger rocks where they stash hay for the winter and spend their time when not gathering plant material. Approximate home range sizes can be used to estimate how many pika inhabit a single talus field as well as to target unique pikas for sample collection.



A pika with a bouquet of plants in its mouth for its haypile leaps from one rock to the next. (Jeff Jones)

### Pika Pellet Patrol

Citizen scientists began monitoring pika presence alongside biologists in 2008. In 2021, the Citizen Science Program piloted the Pika Pellet Patrol Project to determine if the project would be a good fit for widespread volunteer effort. Volunteers hiked into the park, located talus fields, and collected pika pellets to use for genetic analysis. The pilot proved to be extremely successful with 85% of the 48 samples collected providing sufficient DNA extraction. Propelled by these results the project was expanded to a two-year park-wide program in 2023, providing valuable information on current pika presence and distribution and insights into genetic connectivity of pikas in the park that will allow biologists to learn about barriers to movement, dispersal, and breeding patterns.

## Partnership

This project is a collaboration with a team from the US Forest Service Rocky Mountain Research Station led by Dr. Gavin Jones and Dr. Lucas Moyer-Horner. Their team has been revisiting pika sites to detect changes from baseline surveys they conducted between 2007-2010. This year the research team resurveyed 139 patches, completing all resurveys from the original 360 previous sites, collecting approximately 200 pellet samples, and locating 15 new remote talus patches. Citizen scientists have been supplementing their results by surveying sites outside of the research scope of the specialized team, documenting additional talus patches and collecting additional scat samples.

In 2024, the team also deployed Acoustic Recording Units (ARUs) in various talus fields throughout the park to determine what time of day pika activity is highest. This is especially important as higher temperatures make it harder for pika to be active during their normal hours. ARUs will also help to explore if the identification of individual pikas based on their calls is possible. Several of these ARUs will stay deployed over the winter to continue this monitoring. Several remote cameras are also set up to monitor different haypiles throughout the park in attempt to supplement data from the ARUs and talus surveys. A StoryMap with more details regarding the project, results, and future work will be released in 2025.



Dr. Gavin Jones and pika crew member, Dani Owens stand at a tree where they have just installed an Acoustic Recording Unit (Jami Belt).

## Objectives

1. Collaborate with USFS Rocky Mountain Research Station to re-survey sites for detection of changes in pika populations.
2. Collect pellets for genetic analysis to understand connectivity of populations throughout the park.
3. Pilot the use of mapping tools for citizen scientists to document new talus habitats.
4. Better understand pika distribution in the park and how it may be altered by climate change.
5. Determine conservation status of pikas in the park.
6. Monitor pika activity patterns and attempt to determine if calls can be used to identify individuals.

## Survey Methods

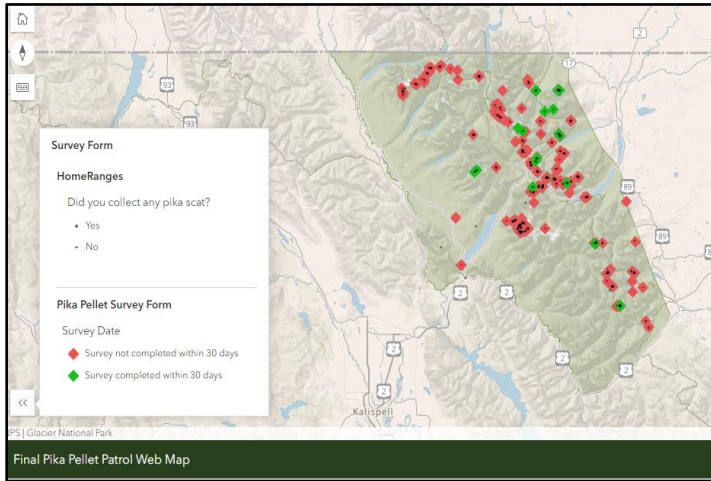
Volunteers first attended a full day in-person training or watched an online video-based training to learn about pika ecology and how to properly survey and collect genetic samples. Once trained, they used Google Earth to find new potential talus patches to survey or opportunistically conduct surveys during normal visits to the park. This greatly expanded our knowledge of available pika habitat throughout Glacier. The volunteers used an online ArcGIS WebApp that displays the data collected by all other citizen scientists. This map is used to determine which home ranges at different sites have already been sampled. They then hiked to those home ranges and searched for pikas and their signs, including calls, hay piles, and pellets. If the volunteers found pellets, they collected up to ten individual pellets using



Rocky Mountain Research Station pika crew on Divide (Lucas Moyer-Horner).

standardized procedures to maximize DNA extraction and minimize contamination of the samples. Finally, they collected data using a Survey123 form, a mobile data collection app used by most of our Citizen Science projects.

We also had a student crew from Iowa State University that attended training and performed pika surveys in three different sites throughout the park. They also put together the majority of our pellet collection kits for the season.



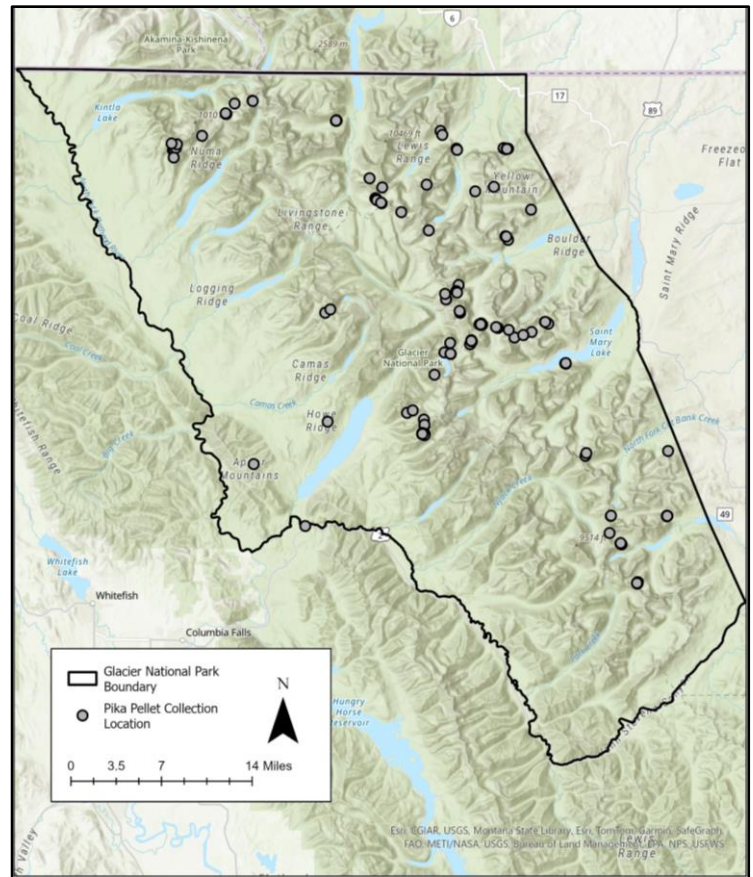
Pika Pellet Patrol Web Map hosted on AGOL (Campbell Melton).

## Hay Piles & Pellets

Unlike many species in the park, pika are active year-round. They do not hibernate. During the winter they spend most of their time within the talus feeding off the hay piles they worked hard to create during the summer. Haypiles are large collections of various plant matter that a pika snipped and collected over the summer. They leave the plants out to dry and then consume their stock over the winter. Pika's also exhibit "coprophagy" which means they consume their own feces. In pika's case, their first round of excrement contains nutrients that they need to survive and looks similar to other small mammal scat as opposed to the easily recognizable pellets. Their second round of excrement looks like a peppercorn and does not contain enough nutrients to make it worth digesting again but does contain trace amounts of DNA. Due to pika being small and quick, physical indications of their presence are much easier to find than the animal itself. Fresh hay piles are a reliable indicator of pika presence, and many Citizen Science surveys begin based on the discovery of a hay pile as opposed to a direct pika sighting.



Photo showing a large fresh pika haypile (NPS).



Map showing 2024 Pika Pellet collection locations throughout the park (Campbell Melton).

## Short and Long Calls

Pikas have two different calls: long and short. While out surveying, volunteers mostly heard the short call that pika use to alert others to danger and communicate territorial boundaries. Often when humans are wandering in or near talus the short call can be heard as pika communicate that a large "invader" is in their habitat. Short calls are typically not heard when small predators, like weasels, are within the talus as pika do not want to risk giving up their specific location to a predator. The long call is less common, and its specific communication purpose is currently unknown.



Pika with its mouth open to vocalize on top of a rock (Jeff Jones).

## Results

This year the project started in late June and ran through September. Throughout the season, 36 volunteers and four staff members conducted 126 surveys and collected a total of 208 pellet samples. They visited 285 total home ranges, taking samples from various sites across the park. Talus patches were ranged from quick and easy to access to challenging and time consuming to get to. Many sites from last year were revisited and several new sites were sampled. Citizen scientists saw pika in 52% of the talus patches and heard pika in 67% of the patches.

## PERCENTAGE OF TALUS PATCHES AND HOME RANGES WITH PIKA SIGNS

### WITHIN TALUS PATCHES

67% PIKA CALLS

52% PIKA SIGHTINGS

### WITHIN HOME RANGES

35% PIKA CALLS

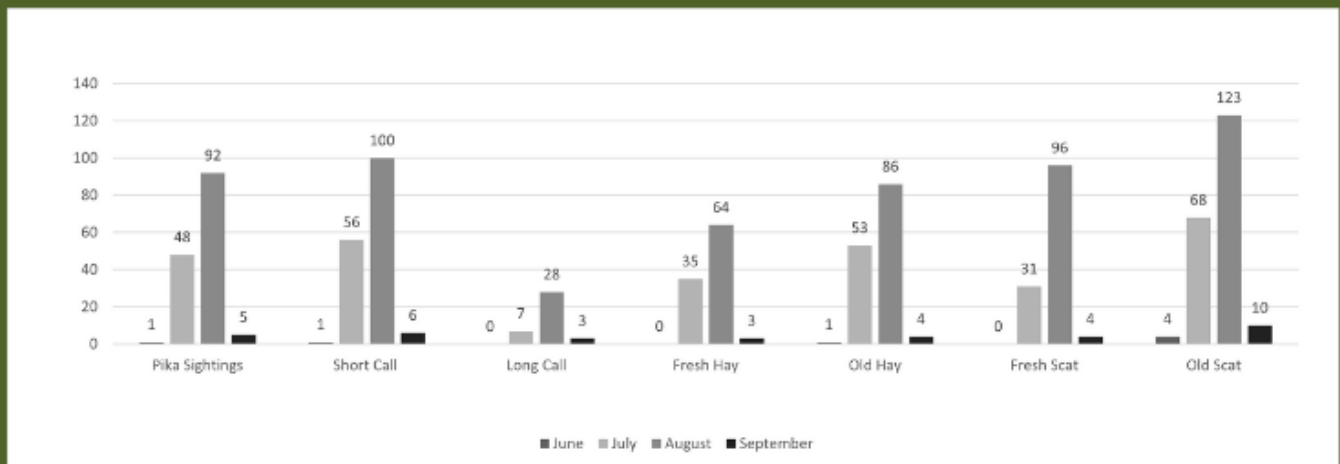
51% PIKA SIGHTINGS

61% PELLETS

41% HAY PILES

## PIKA SIGNS FOUND IN HOME RANGES BY MONTH

NUMBER OF DETECTIONS



## Pi-kus

These Pi-kus were written during a field day to Piegan Pass with Glacier National Park Conservancy board and staff members to investigate the talus fields at the top of the pass. A "Pi-ku" is a biology take on a traditional Haiku- a Japanese poetry format requiring three lines with three syllables in the first line, five in the second, and seven in the final line.

|                                                                       |                                                         |                                                                         |                                                                                |
|-----------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Weasel prowls silence<br>Shaded diorite retreat<br>Ceocal fecal feast | Tiny pikito<br>My potato amigo<br>Sorry, took your poop | Eeping my heart out<br>But I shut up for weasels<br>Love eating flowers | Pika potato.<br>Don't bake in the sun. So hot.<br>Please hide. Survive. Thrive |
|-----------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|

## Nocturnal Pollinator Sampling

In 2023, the Citizen Science Program coordinated a Nocturnal Pollinator Bioblitz for volunteers, in conjunction with researchers from the Montana Moth Project and the C.P. Gillette Museum of Arthropod Diversity. The volunteer-researcher team collected moths at night using light traps. The moths were sorted and packaged the following morning to be later imaged and classified by researchers and entomology graduate students over the winter. In 2023, over 600 specimens were collected and identified, resulting in 195 new species being added to Glacier's list of moth biodiversity. Before the 2023 BioBlitz, the park had almost no information on moth biodiversity with less than 15 species recorded. Of the 600 specimens collected, 309 samples, representing 119 genera and 209 species, were added to the Gillette Museum collection.

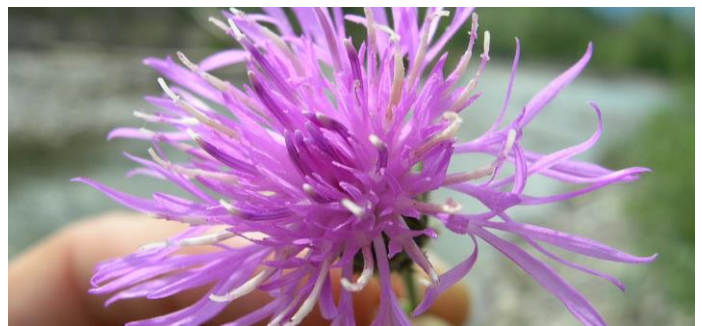
Following the great success of last year, moth researchers, Mat Seidensticker and Chuck Harp, returned to the park this June to conduct smaller-scale inventories focusing on four high elevation and meadow sites. Unfortunately, weather prevented them from accessing the planned high elevation sites; however, they were able to sample prairie, meadows, and lowland forests over two nights. This year's collection included many "micro-moths", moths with wingspans less one inch across, which are difficult to identify and require input from species experts. Students are currently cataloging the 2024 samples and results will be available in 2025. In addition to collecting moths, researchers also collect pollen from a subset of moth samples. Pollen samples will be identified to plant species using DNA barcoding and this information will help researchers understand what plant species are pollinated by moths.

The C.P. Gillette Museum digitally cataloged all specimens which are accessible on their website: [SCAN C.P. Gillette Museum of Arthropod Diversity Collection Profiles \(scan-bugs.org\)](https://scan.cpgillette.org/). A digital guide to lepidoptera (moths and butterflies) found in Glacier National Park was also created from this study. The guide is available on iNaturalist, a crowdsourcing platform for documenting the biodiversity of our planet. Long-time Citizen Science volunteer, Bob Chinn, devoted many hours to developing this helpful resource that allows people from all backgrounds to photograph and identify the moths and butterflies they see in Glacier National Park while generating data for science and conservation. The iNaturalist guide is available on their platform [Glacier National Park Butterflies and Moths · iNaturalist](https://www.inaturalist.org/projects/glacier-national-park-butterflies-and-moths).



Left: Researchers monitor a moth light trap. Center: Citizen Science staff member, Dee Baginski, helping sort and package moth specimens for shipment to the Gillette Museum. Right: Specimens are carefully placed on cotton pads and stored in food containers for safe shipment. One food container can hold a few layers of alternating cotton pads and moth specimens (Julie Merluccio).

## Noxious Weed Blitz



Left: a group of volunteers pulling noxious weeds (Emme Kraus). Right: a photo of Spotted Knapweed, a noxious weed often found around the park (Marian Jones).

The Citizen Science Program hosts an annual Noxious Weed Blitz, inviting volunteers for a day of hands-on learning about local invasive weeds. Volunteers learn from park botanists the difference between native and invasive plants. Native plants are those that have existed historically in the area and provide food and habitat for native wildlife. Invasive plants were introduced into the area by human actions and

have spread aggressively, threatening the growth of native plants, thus endangering the health of Glacier's ecosystems. This year, 15 participants helped to protect these ecosystems by learning to identify and pull five of the park's most prolific invasive weeds including Spotted Knapweed, Oxeye Daisy, St. John's Wort, Houndstongue, and Yellow Toadflax. This year's crew worked hard and pulled many bags of weeds despite non-ideal weather conditions on the day of the blitz.

## Hawk Watch

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Left: A golden eagle soars through the sky. Right: two volunteers stand at the Mt. Brown observation point surveying for raptors (BJ Worth and Jake Bramante).

Hawk Watch is a worldwide, collaborative effort to monitor raptor migration that occurs during both spring and fall migration. Glacier National Park established an official Hawk Watch site in 2021 after piloting several locations beginning in 2017. Park biologists and Citizen Science staff train volunteers each fall in how to identify diurnal raptor species that migrate through the park. The program also hosts an open house each fall with live raptors to spread the word about raptor migration and education the public. This year's event will be on October 5th from 11 am- 3 pm. Glacier is a very important corridor for Golden Eagle migration as discovered in the '80s by park biologists. During September and October at the Lake McDonald Lodge or Mt. Brown observation point, volunteers count thousands of these eagles and other raptors as they fly by, collecting information on their age, sex, and color morphs. This year, a new app, Trektellen, was launched for recording count data. The final report for this project will come out as a separate document in December. For more information about this project, visit the [Hawk Watch NPS page](#).

## Dragonfly Mercury Project

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The Dragonfly Mercury Project is a nationwide USGS coordinated Citizen Science study focused on collecting dragonfly larvae for mercury analysis. Since establishment in 2009, the project has engaged over 6,000 volunteers across 140 national parks. This year, seven student volunteers and their two Montana Conservation Corps Youth Expedition Crew leaders assisted as 55 dragonfly larva and six water samples were collected from three of Glacier's water bodies. Staff members from the Volunteer Office and the Wilderness Office within the park also helped. After settling in a water body, atmospheric mercury can be transformed into a more toxic form called methylmercury, which can then bioaccumulate, endangering animals at the top of the food chain, including humans and wildlife. Dragonfly larvae are useful for biomonitoring because they are found ubiquitously in high concentrations. As mid-level predators of the aquatic ecosystem, they can be a good indicator of the mercury levels in the local food web. They are also relatively easy to find and sample which makes them an excellent target population for large Citizen Science efforts, especially with younger audiences. For more information about this project, visit the [USGS Dragonfly Mercury Project Story Map](#).



Left: A MCC crew and NPS staff members stand around Dragonfly Larvae collection bins at Johns Lake. Right: a dragonfly molting to maturity on the side of a tree (Jami Belt).

## Collaboration And Outreach



Two Piikuni lands crew members conduct a loon survey (Renata Harrison).

### Piikuni Lands Crew

We partnered with the Piikuni Lands Crew (PLC) for the fourth year to conduct loon surveys. The PLC is a Montana Conservation Corps crew of seven young adult members of the Blackfeet Nation. They completed eight loon surveys on tribal lands and 89 hours of work. There were four chicks in three broods detected on Blackfeet Tribal lands this year. Two chicks were detected by the PLC and two by a private landowner.



A scenic photo at a goat survey location (NPS).

### Rocky Mountain Goat Alliance

Each summer, members of the Rocky Mountain Goat Alliance join Citizen Science staff to conduct mountain goat counts. This year, they conducted six surveys in the park from August 22nd to 25th. One group backpacked from Cut Bank to Red Eagle Lake while another group backpacked from to Oldman Lake to conduct surveys at Dryfork and Pitamakin Pass.



Three MCC members stand behind a goat poster at Logan Pass for a goat survey (NPS).

### Montana Conservation Corps

A crew of six young adults from the Montana Conservation Corps conducted high country surveys for two weeks in early September across Glacier National Park. The crew completed nine surveys and assisted with testing updated locations for sites that have become too overgrown by vegetation to survey.



Students from whitefish high school make their way to a lake to do a loon survey (Jami Belt).

### Whitefish High School

Students from an Advanced Placement Environmental Science course at Whitefish High School joined us in May to learn about common loon conservation and monitoring efforts in Montana. The group conducted two surveys at Lower and Upper Howe Lakes. In August, students returned to conduct pika surveys in the Two Medicine Valley.



A class from Flathead highschool came to Two Medicine to do goat and pika surveys (Dee Baginski).

### Flathead High School

International Baccalaureate students in an Environmental Science class at Flathead High School conducted goat and pika surveys at Firebrand and Piegan Pass. Second year students designed their own research projects on pikas, exploring how environmental conditions affect hay piles.



A long line of volunteers, students, and biologists stand in a green meadow waiting to enter the talus to conduct pika surveys.

### Iowa State University

Students from a field-based summer course at Iowa State University joined us for a full day of pika training alongside Citizen Science volunteers and Rocky Mountain Forest Research Crew biologists. In the following days they conducted pika surveys at three different sites throughout the park and manufactured most of the pika pellet collection kits our volunteers used for the rest of the season.

10

PRESENTATIONS

OUTREACH

358

ATTENDEES

13

SOCIAL MEDIA  
POSTS

63,183

TOTAL ENGAGEMENT  
SOCIAL MEDIA

1,175,437

TOTAL REACH

**Thank you to Glacier National Park Conservancy for funding and supporting our Citizen Science Program!**

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A group of Citizen Science and Glacier National Park Conservancy staff on their annual Pika field day at Piegan Pass (Jami Belt).

## **More Information**

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