

THE Durango HERALD

Student voices: Exploring the San Juan Mountains during science camp

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Editor's note: Three students from the Mountain Studies Institute's Experience Mountain Science Program share what they learned during the two-week program.

Discovering plants, wetlands and pikas high in the San Juan Mountains

By Natasha Daney



Daney

Why are pikas' habitats changing? What is a fen and what purpose do they serve? How do oxeye daisies affect native plant species? Can we make a difference?

Before participating in Mountain Studies Institute's Experience Mountain Science Program, I never gave much thought to pikas, fens or daisies. By the end, I felt enlightened on these topics and so many more. On Day 1 of my two-week adventure, I walked with my group to an old mine in Silverton. Surrounding the site were beautiful white flowers I later learned were oxeye daisies. Although pretty, oxeye daisies are an invasive species that reproduce rapidly, taking over entire habitats and diminishing native plant populations. Common in mountain towns, many people plant this noxious weed for its aesthetic and hardiness, without knowledge of the many problems they pose.

The learning continued on Day 2 (my favorite day), when my group helped restore a fen. I'd never heard of a fen before, but I soon learned that they are special peat-forming wetlands. Peat is partially decayed organic matter that forms a squishy top layer. Fens differ from other wetlands because they get nutrients from groundwater movement, upslope sources and surrounding mineral soils rather than precipitation. Because of this, fens are less acidic and have higher nutrient levels than common

wetlands, allowing them to offer diverse plant and animal habitats. Rushes, grasses, sedges and wildflowers cover and support fens by growing in the top layer of peat and preventing erosion. The fen we visited was in a repair process. About 50 years ago, it was severely damaged by grazing and mining that wiped out the plants. Our group planted more than 200 sedge seedlings to help restore the fen to its original glory.

After a yummy lunch with an astonishing mountain view, we set off to search for pikas, whose habitat is transforming because of climate change. Pikas are adorable mammals in the rabbit family (although they closely resemble mice) about the size of your fist. They live at high elevation and do not hibernate during the long, cold winters. During the summer, pikas collect grasses and other plants to eat during the winter. Pikas are migrating to higher elevations to avoid early snowmelt and higher spring and summer temperatures, two consequences of the warming trend occurring in alpine environments.

The subsequent days brought a plethora of knowledge and appreciation for everything surrounding me, from rivers to beetles to soil.

The research aspect is only half of the excitement of this program – the other half is the people. I feel so fortunate to have experienced nature with eight individuals who all have different personalities and lifestyles but the same mindset. We all realize that positive change is possible, and each small thing we do for the environment is one piece of the puzzle of climate change. Spending half a day picking oxeye daisies and planting a mere 200 plants doesn't seem too gratifying, but it's the small things that add up. There's nothing like being outdoors, with eight amazing people, studying ecology every day. Nightfall promised delicious homemade food (made by none other than ourselves), great discussions and s'mores. The combination of academia and fun is what made this trip truly unforgettable.

Laugh. Play guitar by the campfire. Run along a path in the rain. Make prayer flags. Drink hot cocoa on a cold morning. Realize that this is our planet, and we can make a change; we are making a change each day we submerge ourselves in nature and become one with planet Earth.

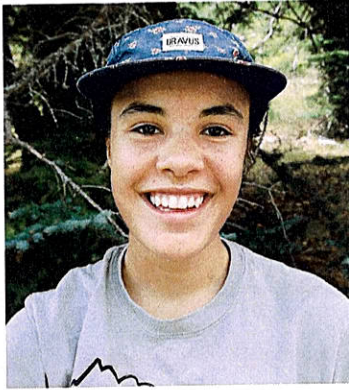
Natasha Daney is senior at Durango High School. She wants to study physics/environmental engineering at university and pursue a career in science.

Life evolves in accordance with available resources

By Zoe Viana Furer

My love for nature – ironically – began indoors. I fell in love with nature when I studied biology at Durango High School. I became enamored with biodiversity and the interconnectedness of evolution. My fascination grew around co-evolution and the way life will reflect a specific geographic location to use the resources available. In this way, evolution acts a lot like a puzzle.

For example, Charles Darwin once received a box from Madagascar containing a star-shaped orchid (*Angraecum sesquipedale*), which interested him because of the long nectary (30 cm). In a letter sent to a friend after receiving the orchid, Darwin formulated a hypothesis based on the remarkable length of the nectary: "In Madagascar there must be moths with proboscises capable of extension to a length of between 10 and 11 inches." After 130 years, researchers from all over the world proved Darwin's hypothesis correct.



Furer

The symbiotic relationship of the moth and the orchid exemplifies how life adapts and evolves in accordance with the resources available. This occurrence has been proved time and time again, just like evolution itself. Similarly, the prevalence of a species reflects the changes occurring in its environment. For example, in the San Juan Mountains, researchers study pika populations to monitor how the rise in temperatures affect mountain-dwelling creatures. The pikas sensitivity to climate change means that they act as an indicator species, providing researchers an opportunity to evaluate the overall health of the ecosystem. Furthermore, pika population sizes allow scientists to estimate population sizes of other species that rely on pikas as a major food source, thus giving us a better understanding of the biodiversity in the San Juan Mountains.

Despite the interconnectedness of life being so observable, why does there seem to be such disparity between our relationship with each other (as humans) and our relationship with nature? Perhaps we have become lost in the constraints of our artificial society, trapped in a prison of our own making. Personally, I find solace in the knowledge that when I am long gone, nature will prevail. My desire to preserve the environment stems from the understanding that I am only a piece of the puzzle. To

remind myself of this, I turn to an essay written by Albert Einstein in which he wrote: "A human being is part of a whole ... Our task must be to ... (widen) our circles of compassion to embrace all living creatures and the whole of nature in its beauty."

Zoe Viana Furer is a senior in high school and hopes to pursue biology in the future.

Rising temperatures threaten pikas

By Lydia Schertz



Schertz

Growing up in Durango, I spent a lot of time hiking and exploring in the San Juan Mountains and have always loved to see pikas. Previously, I didn't realize the importance of healthy pika populations or that they were so threatened by the effects of climate change. But during Mountain Studies Institute's Experience Science Program, we had the chance to monitor and learn more about the pika populations in the San Juan Mountains.

Pika populations are vulnerable to the effects of climate change. The current warming trend as a result of climate change affects pika populations dramatically. Pikas quickly overheat in the warmer temperatures of summer. Pikas begin to overheat at around 70 degrees and can die if exposed to temperatures above 77 degrees for more than six hours. To prevent overheating, they will hide away in the shade to stay cool. As summer is one of their main times to collect food stores for winter months, when pikas are forced to hide from the sun, they may not have enough time to gather enough food to last all winter.

Although warming temperatures in the summer can cause overheating, they can also cause pikas to freeze in the winter as there is less snow, which acts as insulation to keep them warm in winter months. To escape these warming temperatures, pikas move up in elevation to environments with cooler temperatures.

Their high sensitivity to rising temperatures has sparked research to monitor pika population health. Mountain Studies Institute collaborates with several other organizations for the local pika research project, PikaNet. Mountain Studies Institute educates volunteers to collect data about pikas from around the San Juans to monitor the local pika populations.

PikaNet seeks to understand how not only pika populations are responding to climate change but also its effects on the ecosystem as a whole. Pikas act as climate indicators: If pika populations are thriving in a region, then it's likely the ecosystem is thriving along with it because pikas serve as a food source for predators, including weasels, coyotes and birds of prey, and the foraging habits of pikas promote diversity and distribution in various plants.

Pika population decline could have dire consequences for the ecosystem as a whole. Their decline could also be an indicator of the potential effects of climate change on plant and animal life locally and across the United States.

Pika research is a very important step in understanding possible effects of climate change. Over the course of the last two weeks, I have realized the importance of pika as an essential part of the ecosystem and as a tool for understanding our changing world.

Lydia Schertz is a junior at Durango High School.