San Luis Valley Environmental and Conservation Education Council

Natural Resources Education Quarterly

Winter 2006, Volume 5, Issue 1

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Mission: Facilitate programs and services in environmental education for the people of the San Luis Valley

Inside this issue:

Check It Out!

Zillions Of Field Trip Opportunities In The SLV

www.slv-ecec.org

Critters in the Cold

For those of us that have lived here long enough, we know that winters in the San Luis Valley can be cold. With the exception of about ten days, this winter has been down right balmy. Regardless, most of us still don't want to pitch a tent this time of year and spend a night outside.

The wildlife that stays active this time of year doesn't have a choice. Like us, mammals tend to put on a heavier coat to deal with the cold, while birds will lower their body temperatures and shiver.

In this issue of the Natural Resources Education Quarterly, we take a look at couple of our wild winter residents: Bald Eagles and Canada lynx. Bald Eagles actually move into the SLV for the winter, while lynx are year-round residents. The lynx article is written at a level at which you can make copies and share it with your upper elementary students.

Snowshoe hare tracks on Monarch Pass

Also, make sure you check out the article on how people deal with the cold. Apparently, adapting to the cold is all in our heads.

R.O.C.K. On!

By Thomas Cleary, Crestone Charter School

The San Luis Valley Regional Outdoor Center for Knowledge (S.L.V.-R.O.C.K.) is the newest addition to the network of exciting field stations for outdoor education in the valley!

In 2004, a long term lease for a 'school section' (a square mile / 640 acres) of State Land Trust managed land was secured for the development of an outdoor education center by staff from The Crestone Charter School (CCS). The R.O.C.K.'s mission is to expand academic and personal growth through rigorous environmental and experiential education. We will be working with K-12 students from public, private, and home schools from throughout the San Luis Valley doing day programming, and eventually overnight outings. We offer place-based, interdisciplinary, age-appropriate, experiential lessons that are integrated with teachers' ongoing curriculum. We are pleased to report that our emphasis on positive outdoor experiences is paying academic dividends for CCS students. For the fourth straight year, CCS's State Accountability Report (SAR) has named us an excellent school!

At the R.O.C.K., we believe that when a student's sense of wonder is nurtured, it stimulates a natural desire to learn; that when a student learns experientially, the emotions from the experience deepen the learning; and that when knowledge is based in projects with real world applications, the connections increase engagement and retention. The land, located

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Happy birthday to you.

Happy birthday to you.

Happy birthday dear ECEC.

Happy birthday to you!

Fifteen years old and still going strong!

R.O.C.K On! *(Continued from page 1)*

off of Highway 114 and County Road 38EE west of Saguache, CO, has a variety of forest, grassland, and riparian areas perfect for a multitude of outdoor experiences. We co-lease the land with the Sutherland ranching family who run cattle there two months a year and we truly appreciate this partnership on the land.

Currently in its second year, the R.O.C.K. is formalizing its place as a program that is responsive to the educational needs of valley educators. Our goal is to work closely with schools and teachers to enrich student's learning through facilitated, safe, content specific, outdoor education. Our vision and growth plan is based on feedback and input we receive and research of several educationally based Outdoor Education Centers around Colorado including the Aspen Center for Environmental Studies, Gore Range Natural Sciences School, Keystone Science School, and Catamount Institute among others.

The Center is managed by co-directors Charlie Warren and Thomas Cleary and founder Reynold Bean of the Crestone Charter School, a publicly funded charter school in the Moffat Consolidated School District #2. K-12 students from CCS have used the land for a variety of academic classes and environmental adventures. This year we have expanded use to include overnights for CCS students and day trips for Moffat School with logistical and curricular help from R.O.C.K. staff, including pre- and post site classroom visits. We are also developing several long-range research projects which will be available to interested students and teachers. In the next few years we hope to open the Center up to a broader group of schools and programming with the addition of overnight facilities, initiate an annual S.L.V.-R.O.C.K. rendezvous for outdoor education, pilot professional development activities for teachers, and plan and implement conservation service projects.

If you have interest in contributing time or ideas to the development of the S.L.V. Regional Outdoor Center for Knowledge, or you would like to bring your students to the site, please contact the CCS office at 719-256-4907, or thomascleary@roperugs.com, or cwarren@ctelco.net.

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Bald Eagles: Our Majestic Winter Visitors

By Nicole Langley, EarthNest Institute

Swooping low over the snowy piñon trees at the edge of the reservoir, a Bald Eagle skims across the surface of the cold water, plucks a fish in its talons, and effortlessly soars away into the grey sky, leaving only ripples behind. We pause, amazed and grateful, feeling lucky to have observed this moment. What is it about this spectacular bird, wintering in the San Luis Valley, that so affects us?

First, we should be clear about its name. The Bald Eagle isn't bald at all. In English the use of "bald" in its name is a shortening of the word "piebald," which describes something spotted or patchy in dark and light colors. Because the Bald Eagle has a dark brown body and a white head and tail, piebald is an apt description. Its white head is more clearly acknowledged in its Spanish name, *Águila cabeza blanca*, and the French call it *Pygargue à tête blanche*.

Found only in North America, this impressive raptor is the continent's second largest bird of prey, with a length of 31 to 37 inches and a wingspan of 6 to 7.5 feet. Only the California condor is larger. In 1872 the United States chose the Bald Eagle as the country's national symbol, perhaps because it seems to express some ideal that we believe in – could it be Beauty? Power? Intelligence? Some special kind of Virtue, or Truth? Yet we humans are the major source of mortality for this threatened species.

Photo courtesy of U. S. Fish and Wildlife Service

For thousands of years Bald Eagles lived throughout North America from Alaska to Newfoundland, from Florida to California. But in the last century their numbers started to decline due to increased human impacts in primary nesting areas. These impacts included habitat destruction, shooting for feathers, pesticide poisoning, and loss of trees for nesting habitat, all contributing to the near demise of this bird. Since that time, DDT has been banned in the United States and the Bald Eagle has been protected by the Endangered Species Act and other Federal laws. As a result, their populations have rebounded. But the Bald Eagle is still on the U.S. Endangered Species List and is classified as threatened in all of the continental United States except Alaska.

In winter the San Luis Valley's resident eagles are joined by migrant Bald Eagles from more northerly mountain habitats such as Yellowstone Park, drawn to our lower elevation where food is more available. They prefer to roost and nest in large trees close to water, so you can often see them near streams and wetlands where they prey on fish. They also eat squirrels, rabbits, and prairie dogs and they commonly scavenge on sick or injured waterfowl and carrion -- road-killed animals or the carcasses of animals such as elk and deer that die in late fall to early spring.

Colorado has several wild species that are either endangered or threatened. An endangered species is one that is in such danger that it could become extinct. A threatened species is a species that is at risk of becoming endangered. It is very important for people to realize which wildlife species are already endangered and which are threatened so we can all help protect their habitats and preserve the diversity of wildlife.

In July 1995, the U.S. Fish & Wildlife Service reviewed the status of the Bald Eagle and downlisted it from endangered to threatened in four of the five regions in the United States in which it is found. Even if removed from the endangered species list, eagles and their habitat will be monitored and protected in the San Luis Valley and elsewhere, as specified in the Eagle Protection Act and the Migratory Bird Treaty Act.

So, as you watch the Bald Eagle's solitary flight, fish dinner tightly secured, you've had a rare glimpse of a precious animal that only 30 years ago was at the brink of extinction. Two decades ago, Bald Eagles were extremely rare throughout the continental United States, with only two or three pairs of them nesting in Colorado. Protection under the Endangered Species Act, together with reintroduction programs, brought populations up, and the species was reclassified as Threatened in 1995. By 1999, some were suggesting removing the eagle from the Endangered Species List. Careful stewardship in Colorado has increased the nesting pairs by eight or nine each year, so that by 2001 there were an estimated 51 breeding pairs in the State. The most recent annual midwinter count shows Colorado now has a stable population of up to 800 eagles.

Today, thanks to the efforts of the American people, the Bald Eagle once again soars the skies above our streams, our wetlands and our dunes here in the San Luis Valley -- a wintery reminder, perhaps, of certain values which we humans forgot for a while, but which the Bald Eagle will always embody.

The Missing Lynx Is Back!

By Mike Blakeman, Rio Grande National Forest

Did You Know?

The Canada lynx is a type of wild felid, which is a type of cat.

Lynx have feet as large as mountain lions, but lynx only weigh about 20 pounds and mountain lions can weigh more than 130 pounds.

Lynx have furry feet, even between their toes. They can also spread out their toes when walking in the snow, making their "snowshoes" even bigger.

Lynx can meow like a house cat… only a lot louder!

High in the spruce-fir forest a white snowshoe hare slowly hops along the top of the snow. The snowshoe hare's large furry feet help it stay on top of the snow as it seeks out twigs and buds to eat. It's fur turns white in the winter making it very difficult to see against the snow. This animal is well adapted to survive in the deep winter snows of the rocky mountains.

Suddenly, a large gray object leaps from under a spruce tree's branches and lands on the hare. In a flash, the hare is killed by sharp teeth held in powerful jaws. The snowshoe hare has become dinner for the Canada lynx.

The Canada lynx looks a lot like a bobcat, except that it's fur is gray, rather than reddish-brown. Also, unlike a bobcat, it has long black tufts of hair on the tips of its of ears and really big feet. The large, furry feet act like snowshoes helping the lynx walk on top of deep snow. Its thick coat of fur keeps the wild cat toasty warm during the cold winter months. Its gray fur with faded dark spots also helps it to blend into its surroundings, making it easier to sneak up on its prey.

Canada lynx on the prowl. Photo courtesy of U.S. Fish and Wildlife Service

Canada lynx are carnivores that especially like to eat snowshoe hares. When they can't find hares to snack on, lynx will dine on small mammals, like red squirrels, mice, and voles. They will also eat grouse and even fawns and elk calves when they get the chance. The lynx's long, sharp teeth help it to kill its prey and cut through meat like a knife. And its ears can swivel back and forth like a radar searching for the sounds of nearby animals.

Although the Canada lynx used to live in the mountains of southern Colorado, they mostly disappeared about forty years ago. It is believed that trapping, hunting and loss of habitat caused the lynx to die out from our mountains. Then, in 1999, the Colorado Division of Wildlife captured lynx in Canada and transplanted them into our mountains. Most of the lynx were released near the headwaters of the Rio Grande where they could easily move into the Weminuche Wilderness.

At first, the lynx that were transplanted didn't do well and they died from starvation. So, wildlife biologists tried keeping the lynx in captivity for several months while they adapted to the high altitude. The biologists also fed the lynx a lot of high protein food to help them gain strength. Then, the wild cats were released in the early spring when there were a lot of young snowshoe hares hopping around. The wildlife biologists believed that the young hares would be easy pickings for the lynx, making it easier for the cats to get used to their new home.

The strategy worked. Although several transplanted lynx still died, many survived. Now over one hundred Canada lynx kittens have been born in our mountains!

To learn more about lynx, check out this link:

Kids pages from the CO Division of Wildlife:
http://wildlife.state.co.us/kids/lynx_kids_page.asp

Human Adaptations to the Cold: It's Mostly in Your Head

By Judy Lopez, SLV Conservation Districts and Natural Resource Conservation Service

"The weather outside is frightful, but in here it's so delightful"… few of us like to think about the cold or at least being outside in it for long periods of time, this is probably because of our inability to adapt to its extremes, we just don't like it much! Why didn't we adapt when so many other species were able to? Are we adaptation losers? To better understand this let's look at some facts.

Adaptation is a specific change in the structure or behavior of an organism that helps it survive in a given environment. For example, aspen "hardening" and losing their leaves in the fall help them survive winter temperatures as low as eighty degrees below zero. Ptarmigan turn white in the winter making them camouflaged in the snow.

When we think about the human species as a whole, our primary defense against the cold of winter is clothing and shelter. Over time we have come up with numerous ways to utilize materials that are available to us to fight the battle of the cold. According to Peter J. Marchand, in his book *Life in the Cold*, "take away the covers and we display only modest abilities to control the production and loss of body heat."

Science tells us that the only significant short term (change made over a short period) physiological adjustment that the naked human body can make to the cold is to add an insulating fat layer. These subcutaneous folds (rolls) are therefore greater in humans who live in cold places (with the exception of the North American Couch Potato, that's another article). We know that just 1 cm of fat has an insulation value of 1 clo.

A clo is a measure of insulation value and can be best described as the insulation needed to keep and maintain comfortable skin temperature for 8 hours, when a person is inactive at temperature of 20 degrees Celsius and with a humidity level of 50%, without any solar warming. So, one clo is about a business suit and a good winter parka is about 2.5 clo. So, we would be inclined to believe then that people who are obese would be in great shape when it comes to cold. No, not the case. So the story goes, too much of any thing is a bad thing. Studies have noted that people with too much subcutaneous fat will start to shiver much quicker. The key is moderation, as seen in the Inuit and other arctic peoples.

Our bodies can also make circulatory responses to the cold, by constricting blood vessels at the surface of the skin; blood is moved back through the body to deeper vein systems. The result is less heat loss and decreased conduction from the cooler skin surface. When freezing seems forthcoming, extreme vasoconstriction followed by intermittent dilation of the vessels occurs; this produces brief periods of warming by inundating the limb with warm blood. This temperature vasodilatation occurs at different temperatures depending upon the individual and is known as the "hunting response or "Lewis reaction" named after the author who first discovered it.

When it comes to heat production, humans lack some of the regulatory mechanisms that other mammals seem to have acquired. So, increased muscle activity, whether voluntary or through involuntary shivering, is still the primary means by which humans turn-up the internal thermostat. Vigorous activity can increase heat output by ten times, while shivering alone can cause the metabolic rate raise by five times. Cold receptors just below the skin trigger the hypothalamus to induce the shivering response. Shivering occurs when the skin temperature is about 20 degrees Celsius. Prior to the onset of shivering an increase in muscle tone occurs, often felt as tightening of the neck and shoulder muscles this small action alone can double heat production. Besides being emotionally disturbing, shivering also makes us less functional and doesn't give us much bang for our energy buck. It provides only 10% heat for the energy expended. Exercise and movement give us more for our energy thermo unit than does shivering, but it is a great last support mechanism.

Finally, what about mind over matter? Can we simply tell/think ourselves warm? Most of us usually have a preference as to whether we prefer it cool of warm. In her book *Freezing Point*, Lucy Kavaler noted how the military studied the subject in depth in an attempt to determine where to send a soldier to duty; whether he might be more successful in a warmer or cooler climate. According to Ms. Kavalar, "It turned out in the end that the best test of a soldier's ability to adjust was simply to ask each whether they liked cold better than heat." Their answer may have been due in part to some fundamental difference in their physiology, but it "seems that there is no substitute for mental acceptance of the cold." It has also been demonstrated by monks and yoga masters that mind over matter help in the tolerance of temperature extremes, even raising the core temperature by a number of degrees. It must be noted that these are isolated cases and given to incredible amounts of training.

In the end it is clear that acclimatization is one way in which humans are able to increase their tolerance of the cold and that instead of changing our physical form in the way most mammals chose, we took the road to a larger brain that allowed us to adapt our environment to meet our needs. This gave us the ability to utilize some of the coldest places on earth, even though we are essentially warm weather creatures.

Design a Winter Interpretive Trail

By Kathy Zelenka, Great Sand Dunes National Park and Preserve

Background:
Interpretive trails provide a bridge between our daily lives and our natural and cultural heritage. At a park or nature center, they can help connect visitors to a place and engage them with their surroundings.

The act of creating an interpretive trail allows students to be the teachers and provides a full-spectrum educational experience, as students work together to research and create an interpretive trail. There is also an opportunity for your students to be mentors if you choose to have them lead younger students on their winter interpretive trail.

Optional: If your school is located near a natural or cultural setting with interpretive trails, plan a visit and have your students take notes about the characteristics of an interpretive walking trail.

Learner Outcomes: Student groups will work cooperatively to produce a winter interpretive walking trail. Together they will research a topic, choose a focus, write and illustrate interpretive information, lay out a trail, organize information, and teach.

Grades: 3rd-5th, adaptable through high school

Colorado Content Standards: Civics 4.2, 4.4; Geography*; History*; Reading and
Writing 1 - 5; Science*; Visual Arts 1, 3, 4
* depending on the content chosen for the interpretive stops

Group size: the entire class

Time: 3-6 class periods

Materials: vary according to the trail designed

Location: outdoors, in school yard

Procedure for creating an interpretive trail at your school:
1. Research winter and winter adaptations. One helpful reference is a past ECEC newsletter, found on www.slv-ecec.org, then click on "newsletter" and look at the Winter 2004 issue.

2. Plan trail route. As a class, your students will decide on the best location for a winter interpretive walking trail on your school grounds. The trail should be designed so it passes points of interest or features that illustrate something about winter. Walk with your students around the school grounds to look for possible trail stops and wintry things to interpret. Note that you won't physically construct a trail for this activity, but will plan a guided walking route instead.

3. Learn about the trail's winter points of interest. Once a trail route has been chosen, have your students research features of the trail. Plant species, natural features, vistas, and locations where you might be likely to see animals tracks will make good interpretive features. Decide which points of interest to focus on and divide your students into groups that will each research one location. Each point of interest should be assigned a number referencing its numerical location from the beginning of the trail.

4. Use some aspect of winter as a theme to link points of interest together and help those who walk on the trail connect with the area.

5. Write trail guide. Each group should write two to three brief paragraphs that summarize their research about their point of interest. Creating accompanying artwork adds a nice illustrative touch to the final trail guide. An additional small group can be assigned to compile all of the completed information into a trail guide.

6. As a class, create and install temporary, numerically-based sign posts for each point of interest.

7. Produce a trail guide. Make copies of the trail guide and provide a small supply to each teacher and administrator in the school. The class can also work together to lead small groups from younger grades along the trail.

Winter Reading

EARLY READER

The Snowy Day by Ezra Jack Keats
A tale of a boy's adventures in newly fallen snow. Caldecott Winner

Owl Moon by Jane Yolen
Classic story of a night walk in the winter woods. Caldecott Winner

INTERMEDIATE READER

The Long Winter by Laura Ingalls Wilder
A story of the Ingalls family and their experiences in the harsh winter of 1880-1.

Bryan's Winter by Gary Paulsen
The account of a boy's survival alone in the Canadian north woods.

TEACHERS

Last Child in the Woods by Richard Louv
Kids are spending more time connected to something electronic and less time outside. What are the impacts? You may be surprised.

Calendar of Events

January 2006 ECEC turns 15 years old. Happy Birthday ECEC!

March 1 Critterman will portray Dr. Avian Guano for SLV schools. Details will be posted on the ECEC website soon!

March 10-12 Monte Vista Crane Festival.

April 28-30 Teaching Outside the Box. This conference offers an opportunity to share fabulous activities, experiences, and wisdom with others who strive to include nature in their teaching endeavors. The conference will be held at Snow Mountain Ranch in Winter Park. Register by March 10th for the lowest prices. See http://www.caee.org for details.