

Winter 2003, Volume 1, Issue 2

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

Flee, Snooze, or Stick it Out: Strategies for Winter Survival

By Mike Blakeman, Rio Grande National Forest

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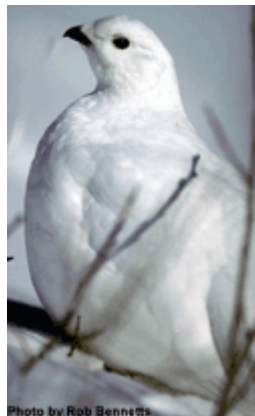
In case you hadn't noticed, it's winter outside. We human residents of the San Luis Valley turn to technology to stay comfortable this time of year, but the plants and animals don't have that option. So what do they do?

Animals use three basic strategies to cope with winter. Many birds pack it up and head south. Most amphibians and reptiles look for a cozy spot and sleep away the winter in hibernation. Hardy souls, such as fish, most large mammals and some small mammals, a handful of birds, and even some insects stay active (or relatively active) throughout the winter.

For those animals sticking out the winter in the upper Rio Grande basin, their biggest challenges are staying warm and finding food. Our native ungulates

(two-hoofed mammals), such as pronghorn antelope, deer, elk, and bighorn sheep, seek out areas with minimal snow to find their food.

These areas include the Valley floor and lower mountain slopes facing the sun. Even though these animals have thick hides, fur, and fat reserves, keeping warm is not always easy. Ungulates need to consume large quantities of energy, rich foods, to stoke their internal furnaces. They also slow down in an effort to reduce their energy use. During years when snow is deep and temperatures are cold, survival is difficult.



Ptarmigan in winter plumage

Birds, of course, use feathers as jackets, and some birds, such as the ptarmigan, use the tremendous insulating properties of snow to reduce heat loss. Ptarmigans will tunnel into the snow and sometimes stay there for up to three days before coming out to feed. Other birds will seek refuge in trees and dense brush. Even feathers and shelter can't stave off the cold on some days and since birds don't have brown fat, they have minimal reserves to burn to generate heat. Instead, birds must generate



Elk in winter

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www.slv-rcd.org/program/ecec

Valley Refuges Welcome New Education Staff

By Kristen Gilbert, Alamosa/Monte Vista National Wildlife Refuges



As the new Outdoor Recreation Planner at the Alamosa/Monte Vista National Wildlife Refuge I do everything from environmental education, to interpretation, to party planning. I am not only new to this job I am also new to the San Luis Valley and Colorado.

I hail from another western state, Utah. I recently finished a Masters of Science in Environmental Education at Utah State University, of which I spent a year in Grand Teton National Park, Wyoming. I was enrolled in the Professional Residency in Environmental Education at the Teton Science School. In this program I taught kindergarten thru college, indoors and outdoors on a variety of nature related subjects. When I returned to Utah I designed an integrated field experience program at another National Wildlife Refuge. My master's project was called the Bear River Migratory Bird Refuge Wetland Wonders Field Experience Program. It included pre-field, field and post-field lessons for a field trip to the refuge and targeted 3rd-5th grades.

I have worked for the U.S. Fish and Wildlife Service on and off since 1995, and I was previously employed at the Bear River Migratory Bird Refuge on Northern end of the Great Salt Lake in Utah. After graduation, I followed the

Sandhill Cranes south and east and landed in the San Luis Valley four months ago. In my new post at the refuge I work on the waterfowl hunting program, National Wildlife Refuge Week, The Monte Vista Crane Festival and education

programs. I see A LOT of potential for education at the San Luis Valley National Wildlife Refuges, and I am very excited to get started on the education aspect of my job. This fall I tried out two field trips with third graders from Bill Metz Elementary and second graders from Boyd Elementary. I wasn't surprised to find kids in the San Luis Valley are just as excited about National Wildlife Refuges as kids in Utah and Wyoming, in fact I would say they are more excited.

In the next couple years, with the help of interested valley teachers, I hope to develop a field trip program highlighting the birds, wildlife and wetlands of the Refuges. If you are interested in a field visit to refuge or you have questions about the refuge, birds or wetlands don't hesitate to phone or email me: Kristen_gilbert@fws.gov (719)589-4021 extension 105.



Boyd Elementary 2nd graders at the Alamosa NWR.

Winter Reading



Snowflake Bentley, by Jacqueline Briggs Martin

This beautiful biography, winner of the 1999 Caldecott Medal, tells the true story of a Vermont farm boy who was mesmerized by snowflakes. Wilson Bentley spent his life taking countless exquisite photographs (many that are still used in nature photography today), examining the tiny crystals and their delicate, mathematical structures. Edifying and snowflake-scattered sidebars offer more information about Bentley's methods and snowflake science. (Ages 4 to 8) --Brangien Davis, Amazon.com

Del Norte Middle School Outdoor Winter Unit

By Jenny Knoblauch, , Del Norte Middle School 6th Grade Teacher

The majority of students in our school come from economically disadvantaged households. Though many students come from families who have been long-time residents of the SLV, they do not tend to get out and explore the area much. For this reason Del Norte Middle School implemented an outdoor unit during the 6th grade year. The purpose of this unit are wide.

One purpose is to expose students to recreational activities available to them in the SLV, a valley known for long, harsh winters. Activities included ice fishing, cross-country skiing, snow shoeing, snow sculpturing and sledding.

Another purpose is to teach the students how to stay safe and healthy while enjoying outdoor activities. With lessons on how to dig and evaluate snow pits, practice ice rescue techniques, learn about survival "kits", basic winter shelters including constructing a snow cave. Also included is basic avalanche awareness including practicing stability determination techniques and locating an avalanche beacon. Orienteering techniques such as reading a topographical map, and using a compass are taught. Students also learn to recognize symptoms of frostbite and hypothermia and their prevention and treatment.

Still another is to expose students to the native plant and animal life and the status of the local plant and animal populations. This includes activities with food webs, ecosystems, tree identification, wildlife management including tracks and trapping. Presenters provide information

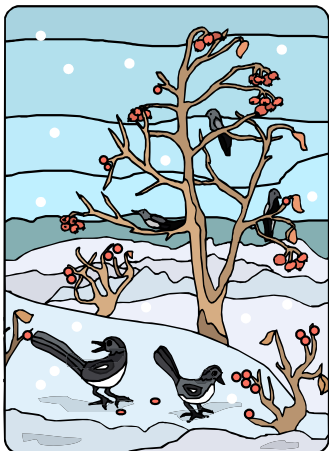


Students learning about snow science and avalanche danger.

on how animal adapt to harsh winter conditions as well as current issues in wildlife management in the SLV such as Lynx introduction, and chronic wasting disease.

We also involve many community members which in addition to sharing their expertise, knowledge, skills, and careers; United States Forest Service, Colorado Division of Wildlife, National Parks Service, National Soil Conservation Service, National Weather Service and Colorado State Patrol. Local historians, business owners and community leaders also provide areas of expertise.

An interdisciplinary unit such as this is a dynamic creation and by its nature will change and grow from year to year depending on the needs of the students and the availability of the guest speakers and presenter. Our goals for this unit are lifelong recreation and safety practices, better understanding of their environment and how they affect it, community interaction, exploration, and importance of staying healthy.



Winter Animal Facts

- Woodchucks reduce their body temps from 98.6 degrees to 37.4 during hibernation.
- Reptiles, Amphibians, and Insects can reduce their breathing rates from 160/min to 4/min.
- Snakes will hibernate with multiple other species in a hibernaculum.
- Frogs and Toads dig underground burrows up to 1 meter deep.



Teacher Resources Page

The Shape of Snow

This activity is best done while it is snowing outside.

Grades: K– 4

Objectives:

1. Students will be able to identify three different types of snow crystals.
2. Students will be able to accurately label whether their snowflake sculpture is fallen or falling snow.

Background: Snowflakes are probably the most dynamic forms of water. Both falling snow and fallen snow can come in many shapes depending on environmental conditions. Falling snow is largely determined by atmospheric conditions (% of water in the cloud, temperature, etc.). Falling snow comes in columns, needles, graupel or the classic stellar crystal just to name a few. As snow rests on the ground (fallen snow), it builds into a snowpack and many new snow forms take shape. Temperature differences within the snowpack generally cause facets form. If there is no temperature difference in the snow pack rounds generally form. If it is a sunny day snow may melt and freeze turning into ice.

Materials:

- 3”X 3” squares of black laminated construction paper. (1 per student)
- Magnifying glasses/hand lens (1 per student)
- Transparency photos of different types of snow flakes downloaded from www.its.caltech.edu/~atomic/snowcrystals/photos/photos.htm.

Procedure

1. Introduce the concept of snowflakes and studying them by reading Snow Flake Bentley by Jaqueline Briggss Martin
2. Discuss the book with your students and explain that art can be found in many places, even in scientific things like snow flakes.

Language of Snow

Inuit cultures have many words to describe snow. Here are just a few:

Api - fluffy snow

Pukak - depth hoar

Upsik - hard windpacked snow

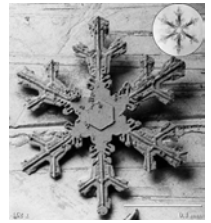
Siqoq - blowing snow

Qali - snow on trees

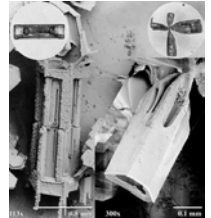
Siqoqtoaq - crusted snow that determines where animals are

3. Have each student take a piece of scratch paper and sketch what they think a snow flake looks like.
4. When students have finished their drawings hang them on the board .
5. Explain that you have some pictures (the transparencies) of real snow flakes magnified many, many times, like those that “Snow Flake” Bentley took.
6. Show the transparencies and make parallels to students drawings.
7. Ask students to tell you what shapes they see in each transparency. (Common shapes include squares, hexagons, columns, triangles, circles)
8. Explain that there are two categories of snow: falling snow and fallen snow. Falling snow is what we see falling from the sky and what we see on a fresh blanket of snow. Fallen snow has been on the ground for a while and has had a chance to change in some way. Using the transparencies describe which crystals are falling and which crystals are fallen snow.
9. Using the cooled black laminated cards and hand lenses, explore the falling and fallen snow in the schoolyard.
10. Allow student 10– 15 minutes in pairs or by themselves to look at different snow flakes with their hand lens. If there is a snowpack (10” plus) dig down deep to see if those crystals differ from the ones falling from the sky.
11. When you return to the classroom ask students to describe the different types of snowflake they observed. Ask them if they saw any that looked similar to some of the transparencies.
12. Have students choose their favorite type of snowflake from the transparencies and sculpt it out of play-doh or sketch reproducing all the correct shapes. (six points/sides, columns, hexagons)
13. Have students label which type of crystal they created and whether it is a fallen crystal or a falling crystal.
14. Display the snowflake creations in your classroom.
15. For more science and art fun with snow go to the website: <http://www.teelfamily.com/activities/snow/science.html>

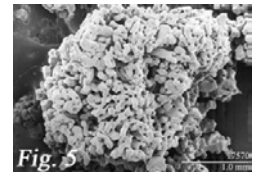
Falling Snow



Stellar Crystals



Column



Graupel

Fallen Snow



Facets



Rounds

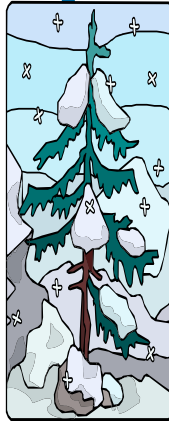


2002 6th Grade Conservation Poster Contest

Every fall Conservation Districts across the nation participate in the 6th Grade Conservation Poster Contest. Here in the San Luis Valley virtually every school participates. The event involves meeting with each 6th grade class, discussing conservation practices, and handing out poster board to every 6th grade student. This year the theme of the contest was, "The Gift of Trees". Youth expressed through art how trees can help conserve our natural resources.

This year's first place winners from each school include: Eimi Chavez, Center; Jennifer Dean, Moffat; Jessica Haugen, Mountain Valley; Cami McCullough, Sargent; Acie Javacera, Monte Vista; Dakota Vinyard, Creede; Breanna Fetkavich, Del Norte; Jennifer Mcloy, Alamosa; Marissa Owens, Centauri; Collin Crowther, Sanford; Shantai Vela, Antonito; Alina Deluna, Centennial; and Ashley Ryland Sierra Grande.

If you are interested in conservation education opportunities, please call Angie at 719-589-3907 x114.



Valley EE Events

January- February

Explore winter with your students.

March

6-7 Valley Science Fair

7-8 Project WILD II: Sandhill Crane Teacher Workshop 589-4021 for details.

7-9 Monte Vista Crane Festival

13 National Wildlife Refuges 100th Birthday Party

Nature Writing and Poster Contest 589-4021.

Registration packets sent out for SLV Natural Resource Conservation Camp

April

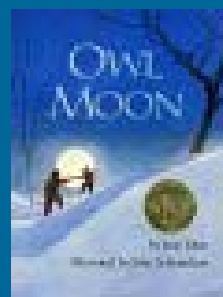
TBA 2nd Annual SLV Earth Day Celebration

22 Earth Day

21-25 National Volunteer Week

25-27 Colorado Alliance for Environmental Education Conference

More Winter Reading



Owl Moon, by Jane Yolen

Among the greatest charms of children is their ability to view a simple activity as a magical adventure. Such as a walk in the woods late at night. Jane Yolen captures this wonderment in a book whose charm rises from its simplicity. "It was late one winter

night, long past my bedtime, when Pa and I went owling." The two walked through the woods with nothing but hope and each other in a journey that will fascinate many a child. John Schoenherr's illustrations help bring richness to the countryside adventure. The book won the 1988 Caldecott Medal. Review by Amazon.com.

Continued from Page 1

heat through muscle movement, which means that when they aren't flying, they must shiver. Chickadees use an additional strategy to help stay warm. When resting, chickadees have the ability to lower their body temperature by several degrees, thus reducing energy consumption by up to 20%.

Many insects over-winter as cold resistant eggs or pupae. Most adult and larval forms of insects find cover under bark, leaves and logs. Insects also "supercool" their bodies to withstand the cold temperatures. Some insects, like spiders, may actually stay active throughout the winter in the subnivian environment (under the snow) or in your home. Spiders must find it pretty easy to capture their prey when it's snoozing and doesn't run away!

Spiders don't have it that easy, as they are not the only ones active under the snow. Shrews, with their insatiable appetites, continue to hunt through the winter. Nothing like a nice fat spider to go along with a super cooled beetle or two. Of course, the shrew has to keep looking over its shoulder for ermines (weasels), coyotes, and even owls will take a plunge into the snow for a tasty shrew.

The subnivian environment isn't the only place bustling during the cold months. Our many native and non-native fish species stay active under the ice throughout the winter. Since fish are cold blooded, most slow down in the frigid water. Some fish species go through a variety of physiological and chemical changes in the winter, such as increased red muscle fiber and enzyme modifications that help them maintain relatively high activity levels. But, unlike snow cover which helps protect terrestrial animals from the cold, ice cover can create hardships for fish. When ice covers a lake or pond, it restricts the exchange of oxygen between the atmosphere and water. Many aquatic plants die back in the winter and start decomposing on the lake floor. This decomposition process uses oxygen and leads to oxygen poor zones where fish can't survive. If no incoming



Ermine or short tailed weasel adorned in its winter coat.

freshwater makes it into the lake or pond, decomposing vegetation causes winterkill.

No winter ecology article is complete without mentioning one of the most famous winter adapted animals. The snowshoe hare is well equipped for winter survival. Its



Photo by Bruce Gill

The well, winter adapted snow shoe hare.

thick fur turns white in the winter, making it difficult for predators to see them. Also, the hind feet have long toes and an abundance of fur that creates "snowshoes" making it easier to walk on top of the snow.

Unfortunately for the hare, the Canada lynx also has large feet compared to its body size. These oversized mitts allow the Canada lynx to chase down snowshoe hares on top of the snow. As many of you know, the Canada lynx has recently been reintroduced to the mountains in the upper Rio Grande basin. Poor snowshoe hares....

This article just touches on the many exciting things to learn about our winter world. We didn't even discuss how plants adapt to the winter, the importance of winter snows to the SLV, or the hazards of winter travel (avalanches)—maybe these will need to be topics for future newsletters.

If you would like to learn more about winter ecology, check out these books (these are especially appropriate for middle school and high school science teachers):

Life in the Cold by Peter Marchand

Winter Ecology: An Ecological Handbook by J.C. Halfpenny and R.D. Ozane

Or check out these links:

<http://www.ed.mtu.edu/esmis/winter/ecology.html>

(includes bullet statements of winter ecology facts)

<http://www.oswego.edu/wscp/WINBIRBK.htm>

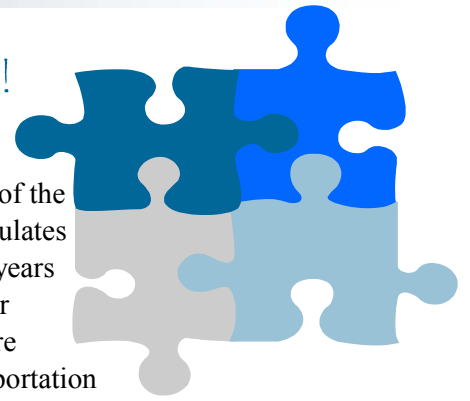
(about birds in the winter)

<http://www.eagle-bluff.org/pages/winterecology.html>

(a great winter lesson plan for upper elementary to middle school)

Teachers and Students Tell It Like It Is!

Since its inception 12 years ago, ECEC has emphasized the importance of taking students outdoors to learn about the natural, agricultural, and cultural environments of the San Luis Valley. We believe that immersing students in outdoor environments stimulates all the senses and, when done well, creates high quality learning experiences. Five years ago, ECEC started helping SLV schools cover the transportation costs of taking their students on outdoor field trips within the upper Rio Grande basin. The following are excerpts from written evaluations from teachers and students who utilized our transportation funds.



"We were able to study and learn about geology, fire ecology, and wildlife using great hands-on lessons. The kids will never forget this one!"

- Sargent Elementary

"I learned that sand can get to 150°F. That's hot! I also learned that there are different rocks and sand on different mountains. The kangaroo rat can jump 5 feet in the air. The other thing I learned was that turtles and otters live 4 miles from the visitor center."

- 3rd grade student, Boyd Elementary (Great Sand Dunes)

"This was a great hands-on experience. Students learned first hand the work involved in ecological research and the process involved in analyzing data."

- Alamosa High School teacher (South Fork Education Center)

"What a great trip! It was truly a learning experience. The student made some great drawings and collected interesting specimens."

- Boyd Elementary teacher (Alamosa Golf Course wetlands and Monte Vista Wildlife Refuge)

"I found many animals there. I found birds, including ducks, swallows, and yellow-headed blackbirds. Also, there were porcupines in the trees. Oh yeah, there were also owls. We found a nest with mallard eggs. There were also a lot of gnats. I got bitten too many times to count."

- 7th grade student, Monte Vista Middle School (Blanca Wetlands)

"I think a person can learn more by learning hands-on and that's a good way to remember things."

- High school student, Centennial High School (Mosca/Hooper area)

The Dead Leaning Tree

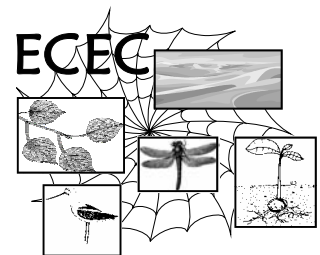
Rough, dead

Dieing, rotting, falling

Gives animals homes

Bald

4th grade student, Sargent



We're on the Web

www.slv-rcd.org/programs/ecec