

# Ca Ventana en los Valles

News of the Valles Caldera National Preserve  
from the Valles Caldera Trust

## Trust Anticipates Good Year in 2010

by Steve Henry, Chair, Board of Trustees

We're at the dawn of a new year at the Valles Caldera Trust, a year filled with high hopes and great expectations. We begin 2010 much the same as we did 2009, which turned out to be a successful and somewhat controversial 12 months. Looking back at 2009, I see that the Board of Trustees (BOT) and staff were extremely busy. We began some new endeavors, completed some pending ones, and had a very busy summer and fall recreation season.

### Sustainability

Beginning last January, we asked the New Mexico State Legislature to provide the Preserve with the legal means to generate more revenue from elk hunting. That body rejected our proposal

*The Valles Caldera Trust oversees the Valles Caldera National Preserve, formerly the privately owned "Baca Ranch." The 89,000 acre property is located in the Jemez Mountains in northern New Mexico. It was purchased by the federal government in 2000 under the Valles Caldera Preservation Act. The property is known for its huge meadows, abundant wildlife, meandering streams, and remarkable scenery. The mission of the Trust is to create a successful model of public land management that protects and preserves the unique values of the Preserve. Toward that end, the Trust will operate the Preserve as a working ranch; strive to become financially self-sustaining; meet the varied needs of visitors; strive to use and steward the multiple resources of the Preserve; and work collaboratively with our neighbors.*



New VCNP science teaching laboratory (top) and student residential quarters (bottom) following renovation by Los Amigos volunteers and VCT science staff (see article on page 5). (Photos courtesy of Bob Parmenter.)

and discussion within the public committee meetings suggested that financial sustainability was not the way the Preserve should be managed. Soon after the legislature's

(continued on page 2)

## The Valles Caldera Trust

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The Board of Trustees is composed of seven members appointed by the President of the United States and two who serve ex officio (Superintendent of Bandelier and Supervisor of Santa Fe National Forest). The appointed Trustees generally serve four-year terms and, except for the Chair, receive no compensation for their work.

*If you would like to receive a copy of the Comprehensive Management Framework, the Annual Report to Congress, the State of the Preserve, or notices regarding events, public Board meetings, or planning for management of the Valles Caldera National Preserve, contact*  
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## 2010

(continued from page 1)

defeat of our bill, the BOT received an in-depth report and modeling tool which indicated the Trust's goal of financial sustainability would be feasible if significant



infrastructure was funded and built for public use. Subsequently, meetings with law makers during a visit to our nation's capital in June revealed that our enabling legislation was deficient in providing authorities to

the Trust that would be vital to achieving this goal.

During this visit, we met with officials of the U.S. Department of Agriculture Office of General Counsel and the Federal Finance Bank. We learned from them that the Valles Caldera Preservation Act provides no means for and is, in fact, an impediment to achieving financial sustainability. We also visited with Senators Jeff Bingaman and Tom Udall. Senator Bingaman told us he believed the Preserve needed a different process for budget purposes and that he was asking the National Park Service to report on the feasibility of the Preserve being assimilated into that system. Related to this effort, the Trust provided information and suggestions for the Senator's consideration in making a decision on future management.

### GAO

The United States General Accountability Office indicated the Trust is behind in its progress toward financial sustainability in a second audit released in October. The GAO also noted that program development and strategic planning issues reported in their 2005 audit are not yet in full compliance with relevant laws. We have made addressing these issues a top priority and will comply with the GAO

(continued on page 3)

# 2010

*(continued from page 2)*

recommendation as soon as we receive direction from Congress regarding the Preserve's future. Meanwhile, the Preserve completed financial audits for all years through FY 2008 and has contracted for 2009.

## *Other Accomplishments*

The Trust completed the Environmental Assessment for Multiple Use and Sustained Yield of Forage Resources and awarded the livestock program to New Mexico State University and Jemez Pueblo for 2009. It was very successful, with cattle being pastured within fences and away from riparian areas. Rio San Antonio anglers voiced no complaints and some even asked if we had any cattle on the Preserve. Staff is working on the EIS for Public Access and Use of the Preserve, and has completed the first round of public meetings.

The Trust enhanced the science and education program through the development of the Science and Education Center in Jemez Springs. The leased facility will be home to visiting students, adults and other groups who will further their pursuit of scientific exploration and serve as a conference center for other interested groups. I want to thank the Trust staff and many volunteers (see page 5) for the many hours spent on the remodeling and upgrade work on the facility. Thanks to their efforts we have minimized costs,



*[Page 2] Young elk with fur still on his antlers. [This page, above] Jemez Pueblo Grazing Association members during the auction at the end of the grazing season. [Below] Moving 'em out! (Photos courtesy of T.K. Thompson.)*

accelerated the remodeling schedule, and already have groups booked to use the facility later this winter.

In the meantime on the Valle Grande, snow covers the ground, the nights are clear and very cold, and the Milky Way is visible for all who brave the winter elements. I hope all the cold weather lovers enjoy the winter activities (see schedule on page 11).

The Board and Staff are proud of the 2009 accomplishments and let us not forget that, under Trust management, the Valles Caldera National Preserve is considered to be in the best ecological condition experienced during the last century!



# Applying Hydrology to Land Management

by Dr. Robert R. Parmenter, Preserve Scientist

(Photos courtesy of the author.)

Since 2004, the Valles Caldera National Preserve (VCNP) has hosted extensive field hydrology research by scientists from the Center for Sustainability of Semi-Arid Hydrology and Riparian Areas (SAHRA) at the University of Arizona. With the development of a detailed hydrologic understanding of VCNP's climate, geology, soils, vegetation, and hydrology, Preserve managers have begun to incorporate research results into their management planning for rangelands, forests, and watersheds, including specific programs such as livestock grazing and management of fisheries and wildlife populations.



## *The Preserve*

The Valles Caldera Preservation Act (PL 106-248), passed by Congress in 2000, provided for the acquisition of the privately owned Baca Ranch. . . . VCNP operates as a working ranch and is to become financially self-sustaining by 2015.

The VCNP land is a collapsed magma chamber (caldera) approximately 15.5 miles across, and incorporates multiple resurgent lava domes that rose following the chamber's collapse around 1.25 million years ago. VCNP is characterized by these forested domes and grassland valles (valleys). Elevation ranges from 7,930 feet at the outflow of the Jemez River's East Fork to 11,254 feet on Redondo Peak, the highest dome in the caldera. VCNP forms a single watershed draining from a breach in the caldera wall to the Jemez River's San Diego Canyon, southwest of the Preserve.

## *Legacies of Human Activities*

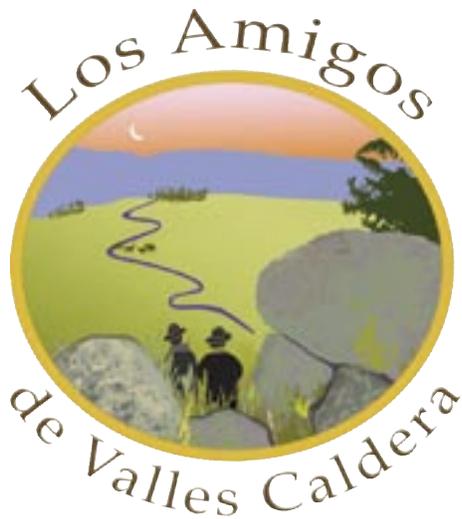
Humans have utilized the VCNP region for at least 10,000 years, harvesting plants and wildlife for food and collecting high-grade obsidian for tools and weapons. As a private land holding, livestock grazing and logging operations dominated human land use in the 19th and 20th centuries, significantly impacting the watersheds and riparian ecosystems. Extensive, long-term overgrazing by sheep (pre-World War II) and livestock (post-1950s) led to substantial degradation of streambanks and water quality; even today the major streams of the Preserve are listed as "impaired" by the New Mexico En-

vironment Department, with total maximum daily loads issued for temperature and turbidity as a result of past private ranch management practices. In addition, extensive clearcutting of the VCNP by the New Mexico Land and Timber Company occurred in the 1960s and 1970s, accelerating soil erosion and contributing to the turbidity loading of the streams. Today's forests are dense with second-growth stands of young pine, fir, and spruce, which pose a substantial influence on fire risk and watershed health (see photo above).

## *Hydro Research Informs Management*

In this water-limited montane ecosystem, VCNP land managers are incorporating both the constraints and opportunities illuminated by new research. Given the poor condition of the Preserve's extensive second-growth forests, managers have begun to thin and burn the "dog hair" thickets of young Ponderosa pine and white fir in an effort to reduce catastrophic fire risk and improve wildlife habitat. Recent measurements have shown that these dense, second-growth forests intercept much of the winter snowfall before it can hit the ground, and as a result, nearly 50 percent of the snow water equivalent (SWE) sublimates and is lost from the terrestrial hydrologic cycle. However, new research has also quantified how snow and SWE are distributed in microsites around trees. A field survey of 900 points found maximum snow accumulation occurs under canopy densities between 25 and 45 percent, cor-

(continued on page 9)



Winter-Spring 2010

## News from *Cos Amigos*

Supporting the Valles Caldera  
National Preserve  
for Present and Future Generations

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### *Cos Amigos Helps Renovate New Science Center*

by *Jim Counce*

The Valles Caldera Trust has leased the Servants of the Paracletes' former hospital facility located on Villa Louis Martin Drive in Jemez Springs. This very large building with 24 bedrooms, a science lab, a meeting room and its own kitchen and dining area was in need of painting and tile work.

Los Amigos volunteers Jack and Darlene Crane, Peggy Gautier, Dale Tuggle and Jim and Dale Counce showed up on October 24th to take on these tasks. Several staff members for the Valles Caldera also participated and include Dr. Parmenter (Director of Science and Education), Caroline Charles (archaeologist), Scott Compton (hydrologist), Mark Peyton (wildlife biologist), Sarah Kindschuh (biologist), and Brigid Shaw (archaeologist).

Dr. Parmenter gave us all a brief overview of the operation of the science and education center followed by a tour of the facility. The center will be ready to host students and staff members from high



(Photos courtesy of Jim Counce.)

schools and colleges from all over the country beginning in January 2010. The volunteers then split into painters and tile setters for the rest of the day. We broke for lunch which was cooked for us by Dr. Parmenter around noon and then

got back to work until about 4:30 pm.

The results were very gratifying with the painters completing five bedrooms and the tile setters completing 750 square feet of the science lab. Jack and Darlene and Jim and Dale volunteered to come back on November 9th to do five more bedrooms. In the meantime staff members for the Valles Caldera completed the tile work.

In January, when the first high school students come to Jemez Springs, they will find freshly painted bed rooms to stay in and a very nice science lab (see photos on page 1) for use in the curriculum that is being developed.

# Restoration Projects Underway

by Barbara H. Johnson

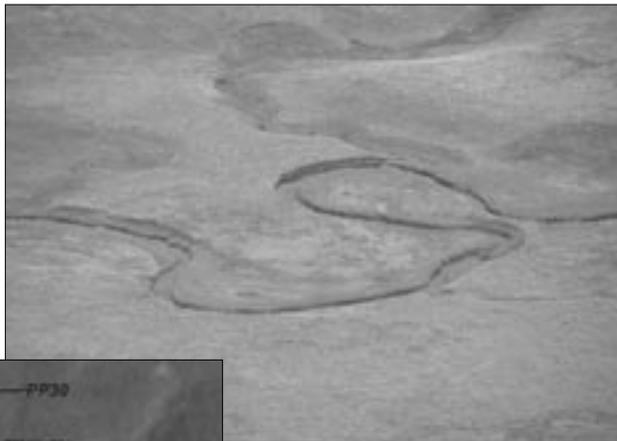
Los Amigos is involved with three restoration projects on the Preserve,

•*San Antonio River Ecosystem Restoration Project:* We are working to restore proper functioning to 30 acres of wetland and to protect the proper functioning condition of approximately 10 miles of San Antonio Creek. This will produce a substantive change in the stability of the creek ecosystem, helping to de-list the stream and improve water quality in the Jemez Mountains. The photos at right show one area where we will be working at what is called an incipient meander cutoff. We will attempt to mitigate the effects such a natural process may have on the overall stability of the creek.

•*San Antonio 319 Project:* We are working to restore San Antonio Creek so that it may be de-listed. It is listed as “impaired” by the New Mexico Environment Department, with total maximum daily loads issued for temperature and turbidity. We will intervene in key locations to ensure that natural stream channel evolution continues in a desirable direction. This work will include in-stream as well as floodplain restoration measures. This project will use innovative restoration techniques being pioneered in New Mexico. In addition, it will leverage other funding to enable Los Amigos and the Trust to make substantial improvement in the San Antonio Creek and Jemez Watershed.

•*Alamo Bog Wetlands Project:* We are partnering with the New Mexico Environment Department to restore bog and slope wetlands and floodplain wet meadow habitat on the Preserve.

We held a steering committee meeting of our partners and contractors on all three projects in November and are having another meeting in January.



We will also be making a presentation on these projects to the Board of Trustees at its January 27 public meeting.

The Environmental Assessment for these projects has been completed and we will be working at our next meeting to set a schedule for work on the ground this summer and early fall. This will include heavy equipment work and opportunities for volunteer work.

One such opportunity will be at the San Antonio Cabin area of the creek. By transplanting sod

by hand, we will plug a small animal-made ditch that is draining the wetlands and redirect this flow to a low-lying area on the left terrace of the creek.

Wetlands sod will be dug from a relatively wide area in a loose and random checkerboard fashion and transplanted right side up to build the plug. The pockmarks from the digging will rapidly fill in with the surrounding native vegetation, creating micro-topographic complexity in the meantime, which is better habitat. This will raise the water table of the wetland, and redirect the flowing exiting the wetland to a natural swale, which will become another wetland.

This project will create up to five acres of wetland by raising the water table, while disturbing 50 square feet of vegetation that will be quickly become wetland vegetation anyway. We hope to schedule this in June.

# *Weatherman to the Rescue!*

*by Dr. Robert Parmenter*

In November 2009, two scientists from the National Oceanic and Atmospheric Administration (NOAA) were doing maintenance on the Climate Reference Network meteorological station in the Valle Grande when they observed a yearling elk hopelessly entangled in a barbed-wire fence. NOAA's Tony Hamby (see right) was successful in cutting the wires, allowing the elk to extricate itself and bound off into the forests of South Mountain.

The Valles Caldera has dozens of miles of old cattle and sheep fence that are hazardous to wildlife, and are no longer needed for Preserve livestock programs. In 2009, several volunteer groups were instrumental in starting to remove these outdated fencelines.

The Trust thanks the WildEarth Guardians, the Albuquerque Wildlife Federation, Los Amigos, the Boy Scouts of America, and students from The Colorado College for their efforts in removing old fences during the summer of 2009—and there are still plenty of fences yet to be removed, so watch for volunteer announcements in 2010 to help make the Preserve more wildlife friendly! And a big thanks to Tony Hamby and Tim Edgemon for a timely rescue!



*(Photo courtesy of Tim Edgemon, NOAA.)*

## *Order Your Morton Print to Help Restore the Bond Cabin!*

Los Amigos de Valles Caldera is selling 350 signed and numbered 18" by 22" lithographs of *Peace in the Valle* by Gary Morton (see page 8). Each is \$225, which includes shipping and handling. The proceeds from the sale of the prints will be used for restoration work on the Bond Cabin, such as pouring a new foundation, eliminating the drainage problem, etc. (All work must be approved by the Trust and be compatible with State Historic Preservation Office requirements.)

To order, please see the Los Amigos website, [www.losamigosdevallescaldera.org](http://www.losamigosdevallescaldera.org), or mail a check with your order to Print, Los Amigos, 3250 La Paz Lane, Santa Fe, NM 87507.

Prints will be given free to each new Los Amigos Lifetime or Obsidian Guild member.

## *Obsidian Guild*

The Valles Caldera Obsidian Guild recognizes individuals who provide support for the Valles Caldera National Preserve through planned gifts. Membership belongs to those who have made deferred gifts to Los Amigos de Valles Caldera through one or more of the following methods:

- provision in a will or revocable trust;
- retirement plan beneficiary designation; or
- life insurance policy beneficiary designation.

Members of the Obsidian Guild share a common bond of generosity and visionary leadership, nourishing the Preserve's unique assets. For further information, please contact Larry Icerman, [licerman@aol.com](mailto:licerman@aol.com).

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*Doug working in front of the Valle Grande. (Photo courtesy of Kathy Fraser.)*

## *From the Chair, Doug Fraser*

In the past few months, we have had another member join our Board of Directors, Jack Crane (see photo below). He has already shown himself to be a tireless worker for the Preserve and for Los Amigos, having been at all the Alamo Bog work weekends, and also removing fence, renovating the new science center, and still finding time to attend all of our monthly Board meetings!

Jack tells us: "I am a Civil Engineer and earned my degree from Texas Tech. My wife Darlene's and my roots are in eastern New Mexico. We have resided in the Sulphur Creek area since 1991 after our retirements. I retired from the U.S. Forest Service after over 30 years of engineering project planning, design, and construction and later in program planning and administration as a senior officer in Alaska, Oregon, California, and New Mexico. After retiring I worked as a contractor locally, constructing and renovating residential and commercial buildings, including a major renovation of the 'Kiva' on the then Baca Ranch and our own log home. I have been a VCNP volunteer since 2001 and more recently as an original Los Amigos member. I am interested in helping Los Amigos continue its efforts in assisting the VCNP to accomplish its mission, in particular by doing hands-on volunteer work on the Preserve."



*Peace in the Valle  
by Gary Morton*

## *Applying Hydrology to Management*

(continued from page 4)

responding to about 20 percent greater SWE than in open areas (see photo at right).

From these data, mathematical models are being developed to maximize SWE retention (minimize sublimation) through forest-thinning prescriptions. For each forest stand of a given age, size, and density structure on a known slope, aspect, and elevation, there is a unique solution to optimize open space (allowing snow to reach the ground) and still provide shade to reduce sun- and wind-driven sublimation. By implementing these thinning prescriptions, VCNP managers intend to increase the amount of water available to the terrestrial hydrologic cycle, enhancing growth of trees, shrubs, grasses, and forbs for wildlife food and habitat, and potentially providing additional streamwater discharge during spring snowmelt for downstream users.

Preliminary estimates suggest that using these forest thinning prescriptions could reduce snow sublimation by up to 50 percent, thereby increasing stream discharge from the preserve by approximately 10 to 20 percent. This enhancement of “ecosystem services” to society in the Rio Grande valley has significant monetary value. VCNP streams produce around 20,000 acre-feet of water each year: a 10 percent increase in stream discharge would equal 2,000 acre-feet. At current water rights prices (the city of Rio Rancho, New Mexico, recently purchased water rights for \$11,000 per acre-foot), the capital value of 2,000 acre-feet would equal \$22 million. If leased at 10 percent of capital value per year, this would equal an annual water benefit worth \$2.2 million to downstream farmers, ranchers, and urban residents.

Concomitantly, the financial benefit of reduced fire risk and increased forage for wildlife and livestock from forest thinning further enhances the collective value to society. Hydrologic principles also are being incorporated into rangeland productivity assessments and forecasts for elk and livestock grazing on the VCNP. Currently, cattle stocking rates are predicated on available spring forage production, soil moisture profiles, and three-month climate forecasts. Satellite-based MODIS remote-sensing imagery are used to evaluate forage biomass on 250 x 250-meter pixels on a daily basis, and managers can examine increasing and decreasing trends



in forage to make real-time decisions on livestock distributions and movements, such as pasture rotations.

Future additions to these applications will include use of NEXRAD data to estimate storm-specific precipitation amounts and distributions, coupled with forage-growth models to forecast short-term (two-week) changes in forage amounts. Hydrologic models that depict watershed dynamics and soil-moisture changes following snowmelt and summer thunderstorm events will further increase the capabilities of this toolbox to accurately predict short-term trends in grassland productivity for grazing programs. These models also can be applied for fire risk assessment and fuels management.

### *Cooking Ahead*

The recent research has added significantly to the knowledge base of VCNP managers, with direct applications to forest and range management. Future models, incorporating remote-sensing, geographical information systems, and real-time monitoring of climate and vegetation dynamics, will greatly enhance our capability to manage public lands in a sustainable and economically efficient fashion. Continued development of basic scientific principles in hydrology and science-based applications to watershed management issues will ensure the successful management and long-term sustainability of the natural resources of the Southwest.

**Editor's Note:** This article is reprinted, in a slightly edited form, from the March/April 2009 edition of *Southwest Hydrology*.

# Elk Calf Recruitment Study on the Caldera

By: Lance J. Bernal & Mark Peyton. VCT Biology Staff

The Preserve is home to 2,500-3,500 head of Rocky Mountain Elk (*Cervus elaphus nelsoni*) throughout much of the year. Elk use the Preserve as spring calving grounds, summer foraging grounds, and fall breeding grounds, but also continue to stay here until the deep winter snows push them to lower elevations. The elk population is of great importance to both the Valles Caldera Trust (VCT) that oversees the management of the Preserve, and the New Mexico Department of Game and Fish (NMDGF), that oversees the management of all animals throughout the state. For the VCT, elk provide Preserve visitors with viewing opportunities throughout their time on the Preserve as well as fall hunting opportunities. To NMDGF, the elk population on the Preserve serves as a source population, meaning it provides the animals for wildlife viewing and fall hunting opportunities in the surrounding national forests.

## Cow Calf Recruitment

Because of the high importance that elk have, managers from both the VCT and NMGFD want to ensure that the population remains healthy and stable. Elk surveys are taken periodically to monitor the herd size and sex/age distributions. During these surveys, biologists conduct counts on overall herd size and calculate ratios among bulls, cows, and calves. During the last



several years, calf:cow ratios (expressed as the number of calves per 100 cows) on the Preserve have been among the lowest in New Mexico, ranging between 20 and 30 calves:100 cows. In a stable or growing elk population, the calf:cow ratio should be 40+. A low calf:cow ratio may lead to low recruitment, defined as the number of calves born each spring and surviving to the next year. Low recruitment numbers lead to a decline in the overall population both on and off the Preserve.

Because of these low recruitment numbers, NMGFD and the VCT initiated a "cause-specific" elk calf mortality study on the Preserve to determine what type of management actions should be taken to increase recruitment. The study began in May 2009 and will last for two years. When this study is completed, managers from both the Trust and NMGFD will compile all of the information collected to create a clear picture of the leading causes of elk calf mortality. This will help managers make the decisions necessary to increase recruitment, and ensure a healthy and stable elk population on the Preserve.

## Radiotransmitters

The study started with VCT biologists, NMGFD employees, and volunteers capturing newborn elk calves throughout the Preserve during the spring calving season (which occurs from mid-May through mid-June with the peak occurring the first



[Top right] Elk calf fixed with radio transmitting ear tag waiting to be released.

[Left] VCT biologist Sage Dunn monitoring radio-tagged elk calves in the Valle Grande, July 2009. (Photos with this article are courtesy of the authors.)

(continued on page 11)

# Winter Activities on the Preserve

Winter activities began in December and are expected to continue through March 21, 2010. The Preserve will only be open on Saturdays and Sundays from 8 a.m. to 6 p.m. In addition, the Coyote Call Trail and surrounding area on the south side of State Hwy4 will be open for skiing and snowshoeing free of charge every day during daylight hours.

Day Use skiing and snowshoeing permits are available as snow and weather allow. Cost is \$10 per adult, \$8 per senior (62+) \$5 per youth (6-15) and free for kids under 5. No pets are allowed on the Preserve, only working assistance animals. No advance reservations are required. You must check in and depart from the Valle Grande staging area, two miles down the Preserve's main road.

Special moonlight events will be offered, if snow conditions permit, on January 30 and February 27. These events run from 6 to 10 p.m. and cost \$15/adult; \$12/senior; \$10/youth, and are free for kids under 5 years of age. Visitors should come prepared for high elevation, winter mountain weather, and night conditions.

Horse-drawn sleigh rides offer visitors an

hour-long ride through the winter landscape. Cost: \$30/adult; \$24/senior; \$15/youth. You will experience the elements, the solitude of winter, and possibly the wildlife of the Preserve. A guide will share the interesting history and lore of the old Baca Ranch, offering you insight into its past and its future.

For more information or to make reservations, call 1-866-382-5537 or go to the Trust's website: [www.vallescaldera.gov](http://www.vallescaldera.gov).

## January

- 16-18 Sleigh Rides
- 16-18 Cross-country skiing and snowshoeing
- 23-24 Cross-country skiing and snowshoeing
- 30-31 Cross-country skiing and snowshoeing
- 30-31 Sleigh Rides
- 30 Moonlight Event

## February

- 6 Ski Orienteering
- 6-7 Cross-country skiing and snowshoeing
- 13 Winter Sky Star Gazing
- 13-15 Cross-country skiing and snowshoeing
- 13-15 Sleigh Rides
- 20-21 Cross-country skiing and snowshoeing
- 27-28 Cross-country skiing and snowshoeing
- 27 Moonlight Event

## March

- 6-7 Cross-country skiing and snowshoeing
- 13-14 Cross-country skiing and snowshoeing
- 20-21 Cross-country skiing and snowshoeing



(Photo courtesy of T.K. Thompson.)

## Elk Calf Recruitment Study

(continued from page 10)

week of June). Calves were captured during the first few days following birth, during a time when they were incapable of running away. Each calf was outfitted with a radio transmitting ear tag, and measurements were taken to assess individual health. Then the calves were released to rejoin their mothers.

The crews successfully tagged a total of 36 elk calves this spring. Each calf is monitored daily for the first two months after tagging and then a few times a

week thereafter to track its movements. If a calf stops moving for a period of four hours (a good indicator of mortality), the radio transmitter sends a "mortality" signal (double the normal pulse rate), and biologists move quickly to triangulate and retrieve the calf's carcass to determine the cause of death. Data are collected of the mortality site, photos taken of the calf and the

(continued on page 12)

## Elk Calf Study

(continued from page 11)

surrounding area, and evidence of predation collected in the fashion of Crime Scene Investigators on TV. If the cause of death cannot be determined on site, the calf's carcass is taken to the lab for a necropsy and further analysis.

### *Calf Mortality*

Of the 36 calves radio-tagged this spring, nearly half have not survived through their first six months. Natural predators such as black bears, coyotes, and mountain lions have taken their share of calves. Other unfortunate events such as trampling and infections have claimed a few calves as well. There have been some cases where only a radio transmitter was found and the cause of death could not be determined. Even still, the calf mortality losses of about 50% thus far do not nearly account for the low calf: cow ratios observed (expected to be 80% loss by September of the birth year), indicating that other factors (e.g., cow age distributions, nutritional factors, etc.) may be contributing to low calf recruitment in the Jemez Mountains.

The surviving elk calves will continue to be monitored throughout the coming months as they migrate downward to their winter range, and the NMDGF will conduct monthly flyovers as well to monitor the calves. The radio-transmitter batteries should last for at least a year and a half, so long-term monitoring will yield additional mortality data, migration movement patterns, and habitat selection preferences—all valuable data for developing sustainable and efficient elk herd management.

The remaining calves still face many obstacles before they return in the spring. More predators and a hard winter with a deep El Niño snowpack may take an additional toll. It will be interesting to see how many of the remaining calves will be able to return in the spring to call the Valles Caldera National Preserve "home" once again.

Los Amigos de Valles Caldera

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[Top] Elk in the Valle Grande on a foggy morning. [Above] An elk calf bedded down in the grass.