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# The Buffalo Chip

Resource Management Newsletter

Yellowstone National Park

March-April 2002



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## YELLOWSTONE'S FIRST FEMALE RANGERS

By Lee Whittlesey

In honor of Women's History Month, we share the following brief excerpt from Lee Whittlesey's upcoming book *Yellowstone's Horse-and-Buggy Tour Guides: Interpreting the Grand Old Park, 1872-1920*. In it, Lee discusses G.L. Henderson's daughter Helen Henderson Stuart, who was the earliest known female interpreter in Yellowstone, having begun her park tours in 1885. It then moves to 1920 to discuss the next known women interpreters, all hired by superintendent Horace Albright in the 1920s):

G.L. Henderson's [one of Yellowstone's earliest interpreters] customers loved him, and many wrote long letters to newspapers and to him personally attesting to that fact:

"[To] G.L. Henderson:—The past six days in Yellowstone Park were the most delightful ones. Your daughter, Mrs. H.H. Stuart, took myself and wife up to the Orange geyser in one of your magnificent Quincy carriages conducting us thence from subject to subject among ever increasing wonders...Such an accumulation of indescribable wonders with such a guide to point out their

beauties, made our first day something like a bewildering dream...The Cottage Hotel Association in its entire management is keenly alive to the necessities of this National Park, my first impressions made under Mrs. Stuart's admirable guidance [being] sustained throughout.

We had Mrs. Helen Henderson Stuart to guide us over the terraces, and if G.L. Henderson, with his world wide reputation of Park interpreter, can make them more interesting than Mrs. Stuart he is more wonderful than the grand terraces themselves. She is said to call attention to all that is most beautiful, while he presents the science and philosophy of them...The Cottage Hotel association has through its members brought out all the marvelous details, for we are informed that G.L. Henderson has been at the baptism of more than three-fourths of the names by which the wonders of terrace, hoodoo, geyser and glen are known. All we meet tell us that he has devoted the best portion of his life to their study, and that while not a single object in Yellowstone Park bears his name, no portion of it is without the impress of his individuality. We hope to see the day when the

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Cottage Hotel Association shall have a hotel at every point of interest in the Park, with just such guides as [Mrs.] Stuart, Klamer, Douglas, Milligan and others to make them comprehensible and fascinating.”

Henderson’s daughter Helen Henderson Stuart, who had married a local hanger-on named Charles Stuart, thus arises from all of this as Yellowstone’s first female tour guide/interpreter, as well as its first known female “stagecoach” driver. She was interpreting Yellowstone at least thirty-two years before Isabel Wasson was hired as a female NPS ranger-naturalist in 1920.

In 1918, the new National Park Service added three fundamental principles and policies with regard to all national parks. These were as follows:

“First that the National Parks must be maintained in absolutely unimpaired form for the use of future generations as well as those of the present; second, that they are set apart for the use, observation, health, and pleasure of the people; and third, that the national interest must dictate all decisions affecting public or private enterprise in the park.”

These principles changed interpretation in national parks forever. The practice became more formal and with more emphasis on correct scientific and historic information, as the new agency took seriously its mandate to serve the public. The year 1920 brought the ranger naturalists into Yellowstone, persons of outstanding educational backgrounds, who began the “Division of Education” specifically to interpret for park visitors.

Interestingly, the first ranger/interpreter ever hired in Yellowstone by the National Park Service to give “lectures” was a woman, Isabel Bassett Wasson, hired in May, 1920 by Superintendent Horace Albright. Albright says he discovered her in 1919 with the Brooklyn *Eagle* party of tourists:

“I was walking through the lobby of the Mammoth Hotel one evening after dinner just in time to hear a young member of the party giving a talk on Yellowstone. She was doing an outstanding job of it. So I returned the next evening to hear her

talk on the geysers and geological features of the park. She really knew her subject, and even included comparisons with geysers in New Zealand and Iceland. Complimenting her afterwards I learned that her name was Isabel Bassett, she was a geology major just out of college, and she was on the *Eagle* tour with her parents...I told her that if she would come back next year I would be glad to hire her as a seasonal ranger. She was married in the meantime, but still came to work for us in the summer of 1920, as Yellowstone’s first woman ranger, one of the first in the National Park Service.”

Albright wanted Wasson back for 1921. He told her he expected to “give you more important work than last year,” adding that he wanted her “to take full charge of the guide situation at Mammoth Hot Springs, as well as the information bureau.” But Wasson was pregnant and could not return.

Wasson mentioned many years later in a taped interview that Albright “thought” she could and should train the park bellporters to “lead geological tours.” If that is true, it is not surprising. That idea had been the interpretive scheme in Yellowstone since 1883, so such an idea was not new and was merely a continuation of what was more or less the norm. But apparently, that was the “last gasp” of such an idea.

In 1921, two other women, Mary A. Rolfe and Marguerite Lindsley, served in similar capacities. Albright noted that the lecture service that summer “was handled by Miss Mary Rolfe, a fine enthusiastic girl, who tried very hard to please.” Lindsley was to be placed “in the Information Office with another girl or young college man.”

Albright seemed to have a penchant for women rangers, for he hired several others. Margaret Thone and Irene Wisdom both served in 1924. Wisdom and Frieda Nelson served in 1925 and 1926, and Frances Pound was on board for four seasons, 1926-29. Her sister Virginia Pound served in 1927. Herma Albertson entered on duty in 1929 and worked through 1933.



1.



2.

1. Marguerite Lindsley and friend at Old Faithful, 1920s.  
 2. Frances "Jim" Pound poses at the North Entrance, 1920s.  
 3. Herma Albertson at Mammoth Hot Springs "elk house," 1929.  
 4. Frieda Nelson (middle) and Superintendent Horace Albright greet Wyoming governor Nellie Taylor Ross at the West Entrance, 1925.  
 5. Who was she? A recently-discovered photo depicting Zillah Pocock, a previously unknown female ranger, at Mammoth Hot Springs, 1922.  
 All photos YNP Archives.

3.



4.



5.



# OBSERVATIONS ON RECENT FOREST INSECT ACTIVITY IN AND ADJACENT TO THE PARK

By Roy Renkin

Aerial reconnaissance and mapping of fires in the park over the past two seasons has allowed for the observation of recent forest insect activity. The following information is condensed from aerial field notes, some ground observations, and discussions with neighboring silviculturalists and entomologists. All of the mentioned insects are native to the Yellowstone region, and have had an influence on forest structure and function since the last Ice Age.

The most widespread insect activity is that of the Douglas fir beetle (DFB) causing mortality to older Douglas fir trees. This beetle, observed to be extremely active in the northern portion of the park in the years following the 1988 fires, apparently subsided its activity during the mid-1990s, and then increased again in the late-90s. DFB activity from the past decade is evident from the road beginning at Roosevelt Lodge traveling east along Specimen Ridge into the Lamar country.

Here, beetle activity is grouped into many small pockets, where gray needle-less crowns indicate older mortalities and the red-needed crowns reflect recent attacks.

Recent activity is also evident in the lower elevations (where Douglas fir forests are found) of all major drainages radiating from the Yellowstone plateau country: in the Mol Heron and Cinnabar drainages to the northwest, on Buffalo Mountain to the north, in the North Fork of the Shoshone drainage to the southeast of Pahaska Teepee, on the northeast flank of Bechler Meadows, and in the Hebgen Lake area of the Madison River drainage. Some field stations outside the park are experimenting with an anti-aggregate pheromone that disperses the beetle, but are having mixed results at best in preventing further attacks. Inside the park, AmFac has removed about 25 beetle-killed trees from the Roosevelt Lodge and cabins area over the past decade.

Relatively recent and perhaps increasing outbreaks of the mountain pine beetle (MPB) have been observed exclusively in white bark pine (WBP). The most widespread activity appears to be in the southeast corner of the park on the Two Ocean Plateau, particularly north of Lynx Creek. Some isolated pockets of MPB activity were also observed in WBP in the Washburn range, the Gallatin range, and along the northeast boundary in the Absaroka range. MPB activity in the park was first noted in 1925, where 42 red-needed white bark pine trees were felled and burned near the Dunraven Ranger Station. Widespread outbreaks were observed in lodgepole pine during the 1930's mostly in the southern portion of the park, and again from 1969 through 1985 where the whole western half of the park was affected. At a recent gathering to discuss the blister rust situation in WBP, foresters lamented that "if white pine blister rust doesn't get 'em, then the MPB will."

Scattered pockets of red-needed subalpine fir and a few Engelmann spruce trees are evident in the southeast quadrant of the park. They appear to be the work of the western balsam bark beetle (WBBB) or spruce beetle (SB). Insect detection flights in the mid-90s suggested increased WBBB activity on the Two Ocean Plateau as well as in the Gallatin range within the park. More recent flights have identified an outbreak of SB especially in adjacent Park County, Wyoming. Ground surveys and verification of the egg and larval galleries would help in determining the relative influence of each agent.

All of the above-mentioned insects are bark beetles whose larvae feed exclusively in the cambial region of tree boles and branches, where they spend the majority of their life cycle. One defoliator, the sugar pine tortrix (SPT), has recently been active on young lodgepole pine in

the extreme southwest corner of the park. The SPT is a very close relative of the western spruce budworm, and has often been called "the budworm that feeds on lodgepole pine." It is the worm-like larva, rather than the adult moth, that is responsible for "damage" to the tree. The larva build a silken web in the current annual growth of understory trees usually less than 25 feet tall, and feed on the new needles from June until August.

The SPT does not kill the tree, but successive attacks over many summers could potentially stress the tree and allow for other secondary agents to infest and perhaps kill it. In late summer, affected trees have a brownish halo about the outer edge of the tree crown due to dead or

missing needles, and a few of the field rangers have commented that the trees appear to be drought-stressed. In July 2000, SPT activity was evident in understory lodgepole pine along the Falls River near Cave Falls and northwest to Mesa Falls. Affected terminal branches were visible from the dirt road leading back to the Bechler Ranger Station. The heaviest outbreak appeared in the Wyoming Creek drainage just south of the park boundary, where all current annual growth on all tree crowns supported a web with a pupating larva!

It is anticipated that all of the previously-mentioned insects will be active and readily observable again during the summer of 2002.



## UPDATE ON ARCHAEOLOGY IN YELLOWSTONE NATIONAL PARK

By Ann Johnson

### *Osprey Beach site*

The Wichita State University volunteers, under Dr. Donald Blakeslee, were in Yellowstone again for a week in summer 2001. They did more inventory and tested the Osprey Beach site (i.e., a small excavated portion of it in order to try and establish its boundaries and whether it contained any artifacts) with the goal of determining how far back from the wave cut bank the cultural deposits extended. This is the oldest site thus far recorded in the park. Test units verified that the Cody Component extends back at least 20 m from the wave cut bank, showing that important information remains to be recovered.

There are at least two components at this site: Cody Complex and Pelican Lake. Of particular interest is an obsidian Plainview point found on the beach by Wichita State in 2001. This indicates that a group older than the Cody Complex used this same location. Plainview, at Medicine Lodge Creek on the west side of the Bighorns, has been dated to 9700 BP.

The Yellowstone Park Foundation has agreed to raise funds for a data recovery effort at this site.

### *Museum of the Rockies investigates possible ford sites*

This past field season was primarily committed to cleaning up loose ends. The inventory along the Gardner River was completed from Blacktail Ponds to Mammoth. Due to steep slopes and erosion, few sites were identified.

National Register testing was accomplished for sites on both sides of the Yellowstone River at the Bannock Trail ford at Tower Falls. However, this "ford" does not meet archeological expectations of a traditional ford, which we suggest should have evidence of many groups camping and staging, probably on both sides of the river, getting ready to cross or drying out afterwards. While there are suitable terraces on both sides of the river at this location, the terraces contain limited evidence of prehistoric use.

There are physical reasons why this may not have been a favored ford. The Yellowstone river roars through a steep, relatively narrow canyon here that would be difficult to ford until high water was over. Additionally, the path up (or down) the eastern bank is very difficult, being

steep and sandy.

In his book *Yellowstone's Bannock Indian Trails*, published in the early 1950s, Wayne Replogle wrote that he could see evidence of the trail in this area, and we believe his information to be reliable. The fact that we can find no trace today, 50 years later, may suggest limited use, and that the area was not a traditional ford. The evidence seen by Replogle may represent use of this route at a more recent date, as Indians tried to avoid detection by the U.S. Cavalry or other Euro-Americans. Interestingly, testing of the archaeological sites did not identify historic or protohistoric components.

Three sites on Hellroaring Creek were tested, including the one at the ford. The archaeological materials on both sides of the ford are plentiful and represent long, intensive use of this locality. All traffic in this area is channeled to this ford as the creek earns its name annually. The sites up the creek from the ford are smaller, with fewer components at each. These probably represent groups traveling up and down Hellroaring Creek with shorter stays due to more limited resources. This testing has allowed us to put the sites at the ford into perspective and judge their importance.

#### *Most Interesting Discovery*

The most interesting find of the year was a pattern of pits in talus slopes. Thirty years ago, a wildlife biologist was conducting an aerial count for bighorn sheep in the park and was looking down on a talus slope north of Tower Junction. There had been a little snow, and it perfectly

outlined a round pit in the rocks. The biologist told then-bison biologist Mary Meagher (now an archeology volunteer), who told me about it two years ago. In September 2001, we found the time to ride horseback into this area and verified that the pit had a cultural origin. We have named this site after the Stradleys, (Jim, Dave, and Roger)

who piloted wildlife researchers over the park for many years, including the day the site was observed.

The Stradley site consists of one exceptionally preserved, round pit about 3 feet high and maybe six feet across. There are at least two other pits

that are less obvious. As we did not do a complete inventory, there also may be others. No diagnostic artifacts were identified, but there were a number of red quartzite cores and flakes, suggesting flintknapping may have occurred while the people waited for sheep to amble by.

Talus slope pits have also been found in the park northwest of Gardiner, Montana, and east of Lava Creek, and we now realize that these three sites represent a pattern. In each case, there is a grassy, level (or nearly level) area above the rocky talus outcrop, and nearby, a vertical cliff leading to the rocky area with the pit(s). Each site is in an area through which bighorn sheep are known to pass. One of the pits northwest of Gardiner includes some wooden poles, suggesting that some or all may have had supplemental cover in order to make them more efficient as ambush sites for sheep hunting. Armed with this information, we will be looking for comparable features at similar locations in the future.



*Dr. Mary Meagher stands in the circular talus pit at the Stradley site.  
NPS photo.*

### *Curiosity*

In July 2000, a large artifact collection made by a park ranger in the 1930s-1950s was returned to the park, and many of the individual collections will be able to be identified to sites because of the descriptions accompanying them. Perhaps the most interesting is a remnant of Southwestern pottery found in a drainage ditch in the Lake area. It is perhaps 1/3 of the rim of a Hopi bowl that has been identified by Barbara Stanislowski (NPS-Santa Fe) as a 1930s ceramic vessel made for the tourist trade. The design is borrowed from prehistoric pottery. The pottery collection was made in the late 1930s, and there does not seem to be any reason to doubt that it was collected when and where the label says it was.

### *Superintendent Norris's Pottery Collection*

Many years ago I visited the Smithsonian Institution in Washington D.C. to examine archeological collections from this general part of world. There, I looked at Big Horn Canyon materials and the artifacts sent to the Smithsonian by Superintendent Norris. For example, the steatite bowls and other artifacts illustrated in his 1880 annual report are there. But there is also a collection of prehistoric pottery that, because it was Norris who sent it to the Smithsonian, has been *assumed* to be from Yellowstone. At the time, I noted its similarity to ceramics I had seen from North Dakota, but investigated no further, although I have continued to wonder about the collection. This has been a considerable mystery to me, because in the more than 120 years since the collection was sent to the

Smithsonian, no similar pottery has been found in or even within hundreds of miles of the park. The question has always been, what was the origin of that pottery?

Recent information appears to clarify this question. In a 2001 newsletter of the North Dakota Archaeological Association, Thomas Thiessen summarized information on Norris's 1875 and 1877 visits to Bismarck, North Dakota and his fieldtrips to On-A-Slant Village while there. Norris's letters, notebook, and newspaper articles are very rare and difficult to find. They provide interesting additional details about the village's fortification ditch, earthlodges (circular wood/willow/grass houses), and the trash middens in the village. The latter contained stone artifacts, shell, animal bone, and "immense quantities of pottery."

A careful comparison of the Smithsonian ceramic collection will need to be made with that from recent investigations at On-A-Slant, there is a good chance that that the Smithsonian's pottery collection was made by Philetus Norris at On-A-Slant Village and did not come from Yellowstone. This conclusion would be the best fit with the current understanding of park and North Dakota archeology.

After leaving Yellowstone (in 1882), Norris's contacts led to his becoming employed as an archeologist by the Smithsonian in the Division of Mound Exploration. Norris was active in this field until his death in 1885.



## **RUSSIAN SCIENTISTS HELP SEEK BRUCELLOSIS SOLUTIONS**

By Glenn Plumb, Wayne Brewster, and Margaret Wild

In December 2000, state and federal Records of Decision were signed to implement a new long-term bison management plan for Yellowstone National Park and the State of Montana. This plan focuses on preservation of

free-ranging bison (*Bison bison*) and risk management to prevent the transmission of brucellosis (a bacterial disease caused by *Brucella abortus*) from bison to cattle that graze on lands adjacent to the park. In addition to maintaining spatial and

temporal separation of bison and cattle, an important component of brucellosis risk management at Yellowstone NP involves the eventual use of a safe and effective vaccine for bison. Considerable effort continues by U.S. scientists to seek an improved brucellosis vaccine. As it turns out, a great deal of research was done in the former USSR on brucellosis during the Cold War, when *Brucella abortus* was identified as an important pathogen with potential use as a biological weapon. At the time, Soviet scientists were provided extensive resources to study the disease, as well as vaccines to prevent it.

Ironically, what was developed out of a climate of mutual fear now forms the basis for collaboration. In 2001, through an innovative partnership sponsored through the U.S. Defense Threat Reduction Agency (DTRA); the World Foundation for Environment and Development (WFED); and Nuclear Threat Initiative, Yellowstone NP resource management staff participated in the development and implementation of new Russian research in brucellosis vaccine development. The progress made will supplement U.S. research geared toward use on Yellowstone's bison. These innovative investigations will be conducted primarily by three Russian research institutes: the Research Center of Toxicology and Hygienic Regulation of Biopreparations (RCT&HRB), the State Research Center for Applied Microbiology, and the All-Russian Research Veterinarian Institute. The Russian home of the European bison (*Bison*

*bonasus*) is the Priosko-Terssny State Nature Preserve. The preserve is located 15 km from RCT&HRB and will be a collaborator in the development of vaccine delivery systems.

With support from the private sector and DTRA, NPS staff from Yellowstone NP and the USGS Biological Resource Management Division traveled to Russia to discuss the status of Russian brucellosis vaccine development and communicate the park's brucellosis risk management needs. These meetings will form a basis for developing collaborative scientific investigations of brucellosis. In September, a Russian scientific delegation traveled to the US to meet with cooperating experts from academia, WFED, and the U.S. Departments of Defense, Interior, Agriculture, and Energy and visit Yellowstone NP to view America's wild bison in the field. Dr. Roman Borovick, Director of the RCT&HRB and a leading Russian brucellosis scientist, summed up the Russian team's reaction to the park by remembering that as a boy, he had been amazed to see "a large green spot on a US map." He added he could not have imagined that in his lifetime he would ever visit such a natural wonder in the heart of America.

While the project's success is not guaranteed, the National Park Service is very proud to participate in efforts to strengthen U.S.-Russian cooperation in connection with development of valuable non-military uses of former Soviet bio-weapons science, a perspective applauded by all sides.



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## WHAT'S NEW IN THE LIBRARY AND ARCHIVES

By Alissa Cherry and Tara Cross

The Research Library has some great new acquisitions that may be of interest. *The Enchanted Land, or an October Ramble among the Geysers, Hot Springs, Lakes, Falls and Cañons of Yellowstone National Park*, by Robert E. Strahorn and published in 1881, is one

of the rarest published guidebooks on Yellowstone in existence.

*See America First: Tourism and National Identity, 1880-1940*, by Marguerite S. Shaffer, discusses many aspects of tourism, including transportation and marketing. Both the national

park movement and Yellowstone are covered in depth. *Crimes Against Nature: Squatters, Poachers, Thieves and the Hidden History of American Conservation*, by Karl Jacoby, details the social and economic effects of the conservaconservation movement on rural America.

Former and current Yellowstone employees are responsible for several contributions. *Bison and Elk Responses to Winter Recreation in Yellowstone National Park* is Amanda Hardy's M.S. thesis, and Paul Schullery has two new works. *Real Alaska: Finding Our Way in the Wild Country* details a trip to Katmai National Park and Preserve and the Brooks River area, and features illustrations by Marsha Karle. Issues related to the management of these areas are discussed. *America's National Parks*, also by Paul Schullery, is a pictorial work focused on natural forces that shape the landscape.

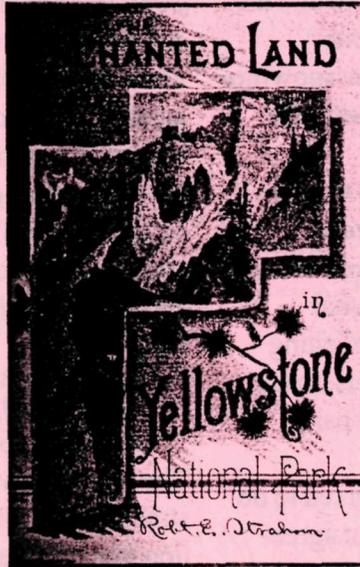
Charles J. Kappler's *Indian Treaties 1778-1883* and the long awaited *Handbook of North American Indians Vol. 13*, covering Plains tribes, are both important works concerning Native Americans. And *They Gazed on the Beartooths*

and *Eighty Years of Memories on the Banks of the Yellowstone plus more*, by Jim Annin, chronicles the people and events that shaped the history of Stillwater County, Montana. Stop by and check them out!

Also, the Yellowstone National Park

Archives has recently acquired and inventoried eight boxes of recent geyser information and data. The boxes include information on virtually every major geyser (and numerous smaller geysers) in Yellowstone's geyser basins, as well as in many of Yellowstone's backcountry areas. The information on major geysers includes visual and electronic data, as well as detailed reports by thermal volunteers. These include extensive reports on the Fountain Group, Giant Geyser, and Fan and Mortar Geysers. Much of the geyser data for major and minor geysers in these files

comes from electronic temperature monitoring, and the files include printouts and analyses of these temperature logs. There are also general geyser activity reports for the major geyser basins dating to as early as 1975. These new files can be found in boxes K 120-127.



Original cover, *The Enchanted Land*.  
YNP archives.



## WINTER USE SEIS Q&A

By Cheryl Matthews and Marsha Karle

The recent release of the Draft Supplemental Environmental Impact Statement (DSEIS) for Winter Use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway to the internet ([www.nps.gov/grte/winteruse/intro.htm](http://www.nps.gov/grte/winteruse/intro.htm)) has many people wondering about the SEIS, why it was done, and what

it says. Here are a few important questions and their answers.

1. *What is a supplemental environmental impact statement?*

A Supplemental Environmental Impact Statement (SEIS) supplements a Final Environmental Impact Statement. It does not replace the

Final EIS. An SEIS builds on an FEIS. Typically, an SEIS is prepared after completion of an FEIS and Record of Decision (ROD) when a new issue or new information comes to light that requires further analysis and consideration of additional alternatives. The majority of the analysis and decisions that were reached in the Winter Use FEIS process are not being reconsidered and are outside the scope of the SEIS. The primary purposes of the SEIS are to look at new snowmobile technologies and afford the opportunity for more public input.

*2. Why was it necessary to do a supplemental environmental impact statement?*  
The preparation of the SEIS was deemed necessary to further the purposes of the National Environmental Policy Act (NEPA) by soliciting more public comment on the earlier decision and alternatives as to maintain protection of park resources.

The Department of the Interior agreed to do the SEIS under the terms of a settlement agreement to a lawsuit brought by the International Snowmobile Manufacturers Association (ISMA), Blue Ribbon Coalition, Inc., Wyoming State Snowmobile Association, et al. The lawsuit asked that the November 22, 2000, Record of Decision (ROD) be set aside. That decision would eliminate most snowmobile and snowplane use from the parks by the winter of 2003-2004, and provide access via an NPS-managed, mass-transit snowcoach system.

*3. What are the limits on numbers of snowmobiles in Yellowstone addressed in the alternatives?* When the alternatives are fully implemented:

*Alternatives 1a and 1b:* recreational snowmobiles would not be allowed.

*Alternative 2:* 1300 snowmobiles per day would be allowed parkwide in Yellowstone.

*Alternative 3:* 930 snowmobiles per day would be allowed parkwide in Yellowstone.

The proposed daily use limits for alternatives 2 and 3 could change over the years if the proposed adaptive management framework is implemented

for the alternatives.

*4. Why is there no preferred alternative identified?*

The National Environmental Policy Act regulations do not require that a preferred alternative be identified in a draft document. A preferred alternative will be identified in the Final SEIS. The public is encouraged to look at each alternative equally and provide their thoughts on the different alternatives. DSEIS readers are urged to look carefully at the details of the alternatives, their implementation strategies and the proposed monitoring programs, and to refer back to the FEIS that this SEIS amends. A final decision could be a mix of various actions from the different alternatives (including the 7 alternatives in the FEIS).

*5. Did ISMA and the cooperating agencies submit additional information regarding new technology?*

The NPS received data on one production four-stroke snowmobile in November, 2001. Information from the manufacturers is included as an appendix to the SEIS. The cooperating agencies submitted additional information that includes visitor survey information, the autonomy of the economics of nearby communities, and oversnow vehicle sound information. Page 85 of the SEIS (Chapter 3, "Affected Environment") includes a list of materials presented as new information, and a summary of how each was considered.

*6. Were economic effects on surrounding communities considered?*

Economic effects has been one of several key issues considered, measured and addressed throughout the winter use planning process over the past decade. Potential economic effects from all seven alternatives were fully evaluated in the FEIS and the rulemaking process, and compliance with all appropriate laws occurred. Those analyses were updated in the DSEIS and will be updated for the upcoming rulemaking process.

*7. How can you ignore the impairment finding in the previous record of decision?*

The Final EIS and its Record of Decision, which

includes a finding of impairment, stand today as the decision/direction as the result of a previous planning process. In accordance with Director's Order 12, the NPS will determine whether the adverse effects would constitute impairment of resources as part of the SEIS process.

8. *Could an alternative from the FEIS be chosen as the final decision on the SEIS?*

Yes, or a combination of alternatives could be used.

9. *How will you assure that enough snowcoaches are available if Alternative 1a or 1b is selected [see News Briefs]?*

From 1994 to 2000, the NPS had a moratorium on authorizing new commercial services in Yellowstone National Park, including allowing any new snowcoach businesses. As the FEIS was completed in the fall of 2000, the NPS began implementing its direction by authorizing existing snowmobile guides and outfitters to add snowcoach service without competition. Several added snowcoach service that winter and more

did this winter.

In summer 2001, the NPS issued a request for proposals for additional snowcoach service in Yellowstone. These were short-term (2-year) commercial authorizations with no preferential rights for renewal. This winter 12 companies are offering snowcoach tours and in addition, seven more operators were granted permits in late fall but are not operating this winter.

Whatever the outcome of the SEIS process, the NPS would continue to work with communities and states on marketing access to Yellowstone in winter.

10. *What is the schedule for completion and when can we expect a final decision?*

Hard copies of the SEIS are expected to be available by March 29, 2002. The comment period will close on May 29, 2002. The final SEIS is scheduled to be available to the public by October 15, 2002, with a Record of Decision scheduled for November 15, 2002.



## ANNUAL COOPERATIVE BIGHORN SHEEP CLASSIFICATION GROUND SURVEY, WINTER 2001-2002

By Dan Reinhart and Jim Caslick

On January 3, 2002, the annual bighorn sheep classification ground survey was conducted on winter range from Mt. Everts in Yellowstone National Park to Point of Rocks in the Gallatin National Forest. This survey is an effort of the Northern Yellowstone Cooperative Wildlife Working Group. Since 1992, the Working Group has also conducted spring helicopter surveys of bighorn sheep ranges in the Gardiner Basin (Yankee Jim Canyon to Mammoth), and in 1995 extended that survey route into the Lamar Valley in Yellowstone National Park, i.e., these ground survey numbers are not representative of the total area bighorn count.

The objectives are to determine ratios of lambs and rams to ewes, and to observe the condition of sheep that occupy the Gardiner Basin area during winter. Routes were surveyed by participants from the U.S. Forest Service, Montana State University, and National Park Service. Weather conditions this year were high overcast, 25° - 30° F, light breeze, with up to 6 inches of old snow and one-half inch of new snow on routes within Yellowstone National Park, but mostly bare ground on other routes.

Since 1979, sheep classification ground surveys have been conducted using established survey routes. Depending on the terrain and

visibility from roads, routes were either surveyed from vehicles or were hiked by observers. On each route, at least one observer had surveyed the same route last year. All participants recorded their sheep observations on a standardized data form. Six previously-established routes were surveyed this year. Five of these routes have been surveyed annually for at least ten years. This is the third year that the LaDuke Springs/Basset Creek Trail was surveyed.

Thirty-one sheep were classified during the survey, including 12 rams, 14 ewes, and five lambs. Ratios were 36 lambs/100 ewes and 86 rams/100 ewes. This is a higher ratio of lambs than in the previous six years, and an average ratio of rams during that period (see table below right).

A two-year study of impacts of human activity on bighorn sheep in Yellowstone was completed by Ostovar in December 1998. At the outset of his study in 1996, Ostovar fitted four young rams and 14 ewes with radio collars designed to break away in approximately two years. This year, no collared sheep were observed. However, radio-tracking indicated that there were 11 active collars on December 21, 2001. During our cooperative winter ground classification surveys, collared sheep have been observed as follows:

	Collared, March 1997	Observed, December 1997	Observed, December 1998	Observed, January 2000	Observed, December 2000	Observed, January 2002
Rams	4	3	2	3	1	0
Ewes	14	11	5	1	2	0

**Summary of Bighorn Sheep  
Classification Ground Surveys,  
1979-80 through 2001-2002\***

No coughing sheep were observed on McMinn Bench. One coughing ewe was observed on the Basset Creek Trail route.

Bighorn sheep are subject to many causes of mortality. During his 1997-98 study, Ostovar observed one predation attempt on sheep by a golden eagle, four attempts by packs of coyotes, and one attempt by a mountain lion. He documented kills of two adult ewes by mountain lions. During fall 1999, fragmentary remains of six to 10 bighorn sheep were found in a small area on Mt. Everts, including horn sheaths of four to five ewes and one ram, and two radio collars. Probable cause of death was lightning. There have been no documented wolf kills on bighorn sheep since wolves were reintroduced in 1995. On 12 November, 2001, a male cougar attacked a full-curl ram at the top of a cliff on Mount Norris, and both animals fell approximately 350 feet to the cliff base, where their carcasses were found the same day. This year there were no reports of road-killed bighorns.

Year	Rams	Ewes	Lambs	Unclass	Total	L:100E	R:100E
1980	31	36	21	0	89	59	86
1981	84	127	50	0	265	39	66
1982	42	74	33	0	156	45	57
1983	36	26	7	0	72	27	138
1984	21	15	2	0	38	13	140
1985	21	19	6	0	46	32	111
1986	25	24	10	0	59	42	104
1987	48	33	12	0	93	36	145
1988	40	45	33	0	108	73	89
1989	40	55	22	0	117	40	73
1990	47	69	5	0	121	7	68
1991	58	82	8	3	151	10	71
1992	29	28	10	2	69	36	104
1993	39	45	12	9	105	27	87
1994	33	35	11	0	79	31	94
1995	33	49	21	4	115	43	68
1996	50	46	14	6	116	31	109
1997	38	52	13	0	103	25	73
1998	38	52	7	0	97	13	73
1999	28	26	10	3	67	15	108
2000*	24	22	6	5	57*	23	109
2001*	12	22	6	0	40	27	55
2002*	12	14	5	0	31	36	86

\* includes new area (LaDuke Springs/Basset Creek Trail).

## ANOTHER EARTHQUAKE SWARM

By Bob Smith and Henry Heasler

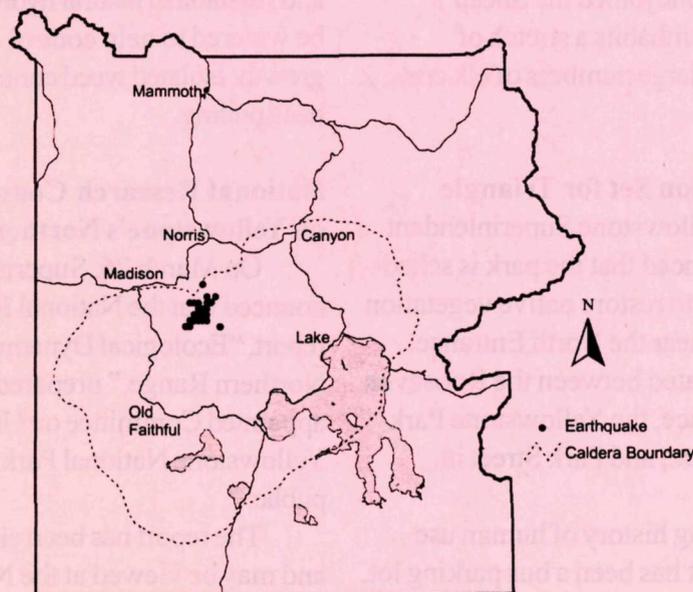
An earthquake swarm occurred in Yellowstone's central plateau on January 15, 2002. An earthquake swarm is defined as earthquakes occurring roughly in the same area over a relatively short time period.

As seen in Figure 1, the swarm was located in an area of known seismic activity that had not been active for some time. The sequence peaked with a magnitude 2.9 quake at approximately 2 km depth, and lasted only a few hours. It was nonetheless notable, as Yellowstone's seismic activity was low during the past year, and this swarm was the first significant activity of 2002.

The sequence lasted only about seven hours, and did not show any distinct spatial or depth trends. The epicenters were near some post-caldera volcanic vents and near the area of the

1975 Norris Junction earthquake of magnitude 5.7 that was associated with northwest trending earthquake sequences. The trend of the 2002 sequence is northeast, perpendicular to the dominant seismicity northwest of the caldera, but approximately aligned with the background seismicity in this particular area that is nearly parallel to the Elephant Back fault zone, about 15 km to the southeast.

For realtime web accessible seismic data for Yellowstone see: <http://www.seis.utah.edu/recactivity/recent.shtml>; and for crustal motion data from the Yellowstone GPS (Global Positioning System) monitoring network see: <http://www.mines.utah.edu/~rbsmith/RESEARCH/UUGPS.html>.



*Location of January 15, 2001 earthquake swarm.  
Map by Henry Heasler.*

## ...NEWS BRIEFS...

### **USFWS kills 4 wolves near Chico**

On March 26, U.S. Fish and Wildlife Service officials shot and killed four wolves near

Chico in Montana's Paradise Valley after a wolf killed a calf during the week before. The three males and one female were part of the Sheep

Mountain pack, which typically roams south of Dome Mountain and north of Chico. One was a collared wolf that had originated in Yellowstone. FWS wolf recovery coordinator Ed Bangs said a rancher reported that one of his calves had been killed March 18, and aggressive action was taken because the wolves have caused problems previously in that stretch of Paradise Valley.

Four of the wolves were shot not only because of the March 18 attack, but to reduce the pack size. Bangs said he believes they took the right wolves out, but said he can't be certain. With the Sheep Mountain pack reduced by four, Bangs is hoping for fewer problems in Paradise Valley. "But," he added, "if they depredate again, we'll do it again."

Last year, the pack's alpha male was shot after livestock was killed. During the winter, wolves from Yellowstone joined the Sheep Mountain pack, which inhabits a stretch of Paradise Valley where large numbers of elk congregate in the winter.

### **Vegetation Restoration Set for Triangle**

On March 25, Yellowstone Superintendent Suzanne Lewis announced that the park is scheduled to begin a project to restore native vegetation on the "triangle" area near the North Entrance. The project area is located between the Roosevelt Arch, the North Entrance, the Yellowstone Park Transportation Complex, and Park Street in Gardiner, Montana.

The area has a long history of human use. Throughout the years it has been a bus parking lot, a horse racetrack, an elk feeding ground, and an irrigated hay field. As a result of this disturbance, the eleven-acre area has experienced a lack of native vegetation and a proliferation of exotic weeds, including Russian thistle—considered a nuisance and fire hazard. Four years ago, steps were taken to eradicate the weed population.

The triangle-shaped area has long been arid, dusty, barren, and flat, averaging only 10-12 inches of precipitation a year. A four-year drought

has created unusually dry conditions to the area, resulting in little vegetation and no support of any new growth. In January 2002, the area experienced a major windstorm, creating visibility problems and moving much of the topsoil toward the Gardiner Transportation building and residences and the town of Gardiner.

Studies have been done on the area and short- and long-term solutions identified to mitigate the situation. Starting March 27, 2002, (weather permitting) and continuing through April, clean up of the deposited topsoil and erosion-control efforts will begin. Native indigenous seed will be hand-sown and raked over the area, and shredded fir-cedar mulch will be lightly spread and watered to establish vegetation. Native shrubs will be transplanted into the area, and at least one culvert will be installed under the road between the Roosevelt Arch to the North Entrance road to try and reestablish natural hydrology. The triangle will be watered to help control erosion and promote growth. Isolated weed control will continue with hand pulling.

### **National Research Council Releases Report on Yellowstone's Northern Range**

On March 26, Superintendent Lewis announced that the National Research Council's report, "Ecological Dynamics on Yellowstone's Northern Range," prepared by the specially-appointed Committee on Ungulate Management in Yellowstone National Park, is now available to the public.

The report has been electronically published and may be viewed at the National Research Council's (NRC) website at [www.nationalacademies.org](http://www.nationalacademies.org). The NRC will publish the report in book form later this spring. Yellowstone National Park will also announce the availability of this version.

Management of Yellowstone's northern range, home to North America's largest elk herd as well as many other native mammals, has been the subject of debate for more than eighty years. Superintendent Lewis praised the report as a

“significant milestone in the long history of the northern range. Research in the past twenty years has challenged traditional beliefs about every major aspect of the range. It was the right time for a distinguished body like the NRC to step in to evaluate all the new work, and to tell the many groups involved in this complex issue where research efforts should be directed next.”

The NRC report is an evaluation of research, rather than a critique of policy. The Committee specifically addresses questions about the population size and dynamics of elk, bison, and other species; the condition of the grasslands and woody vegetation (such as willow and aspen); and the effects of predators on the natural setting, with special attention to the role wolves may play in plant and animal communities. The report concludes with an extensive list of recommendations, to “enhance understanding of the key processes that affect Yellowstone’s ungulate populations, vegetation, and ecological processes.”

Superintendent Lewis said that the report was sure to begin a whole new round of discussions. “Whenever a document this important appears, it is essential to analyze it in great detail. Every position in the debates over the northern range receives its share of criticism and its share of compliments. Yellowstone’s staff will be spending a great deal of time with this report and hope all the other interested parties will too.”

Making sure that the public has full access to the findings of the Committee is a high priority, Lewis said. “Our neighbors and partners need to know what the NRC has concluded. The park will publish the Committee’s conclusions and recommendations in *Yellowstone Science*, our quarterly research journal. We will distribute the report to our interpretive rangers so they are well informed when they get questions from the public. The report will be distributed to regional libraries, and the Yellowstone Association and park concessioners will be urged to carry the report in their sales facilities throughout the park.”

The National Park Service’s highest priority, according to Lewis, will be “to follow up on the

Committee’s excellent recommendations. This report, through the work of the committee, has shown that no matter what opinions we hold, what can be done by a determined group of people working together to make sense of a very complicated issue. We have been given the opinions of the highest scientific court in the land, and we intend to use this information to continually improve our care and attention to these priceless resources.”

### **Winter Use DSEIS released**

On February 19, 2002, the Draft Supplemental Environmental Impact Statement (DSEIS) for Winter Use in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway became available on the internet. Hard copies of the DSEIS will be available by March 29, 2002.

The SEIS includes four alternatives but does not designate a preferred alternative. Briefly, the four alternatives are:

**Alternative 1a** - No Action alternative that allows for implementation of the current rule allowing access to the parks via snowcoaches only in the future. A phase-out of snowmobiles would begin the winter of 2002-3 with a full ban on snowmobiles effective the winter of 2003-4.

**Alternative 1b** - Also a No Action alternative, but implementation of the current rule would be delayed until the winter of 2003-4 with a full ban on snowmobiles effective the winter of 2004-5. Both of the No Action alternatives provide for access by a NPS-managed, mass transit snowcoach system.

**Alternative 2** - Provides for non-guided snowmobile access. It phases in proposed EPA 2010 emission standards by 2005 for cleaner snowmobiles and limits decibel levels to 75 (current limits are at 78 decibels). It also provides for a daily cap on numbers of snowmobiles and calls for increased NPS management of winter use.

**Alternative 3** - Provides for access by guided snowmobile tours with snowmobiles that must be the best available technology for sound and

emissions. Snowmobile numbers would be limited, and visitors would be encouraged to shift to snowcoach services.

The document can be found at [www.nps.gov/grte/winteruse/intro.htm](http://www.nps.gov/grte/winteruse/intro.htm) A link for the Final EIS and Record of Decision published in 2000 are also available at the same addresses for the convenience of interested parties. Comments will be accepted for the record beginning with the date of internet posting until May 29, 2002. They must include a name and return mailing address (other than an email address), and may be submitted via email to: [grte\\_winter\\_use\\_seis@nps.gov](mailto:grte_winter_use_seis@nps.gov) or by mail to: Winter Use SEIS, P.O. Box 352, Moose, Wyoming 83012.

### **2001-2002 Northern Range Late Winter Elk Classification Survey**

The Northern Yellowstone Cooperative Wildlife Working Group conducted its annual late-winter classification survey of the northern Yellowstone elk population February 27 and 28, and classified a total of 4,001 elk. Biologists used a helicopter to count bull, cow, and calf elk in specified sampling areas through the entire northern range during the 10½ hour survey. The northern Yellowstone elk herd winters between the northeast entrance of Yellowstone National Park and Dome Mountain/Dailey Lake in the Paradise Valley.

Estimated sex and age ratios for the population were 14 calves, seven yearling bulls (i.e. spikes), and 36 adult (branch-antlered) bulls per 100 cows. According to Yellowstone National Park supervisory wildlife biologist Glenn Plumb, who is a member of the Working Group, the estimated ratio of 43 bulls per 100 cows is similar to the average ratio of 46 bulls per 100 cows surveyed since 1995, but the estimated ratio of 14 calves per 100 cows is less than the range of 22 to 34 calves per 100 cows observed during the past six years.

The low calf:cow ratio suggests that the number of calves born in 2001 that will survive to join the northern range elk population will be relatively low. The calf:cow ratio is lower this winter than in recent years, and potential contributing factors likely include drought-related effects on pregnancy and calf survival, predation, hunting, and winter-kill. However, the observed calf:cow ratio from this survey cannot be used to predict that the calf:cow ratio of the northern Yellowstone elk population will remain low in future years, and/or that elk abundance will decrease, according to the Working Group. The Working Group will continue to monitor trends of the elk population and evaluate the relative contribution of various components of mortality, including hunting, environmental factors, and predation.

The *Buffalo Chip* is the resource management newsletter for Yellowstone National Park. It is published periodically by the Yellowstone Center for Resources.

We welcome submissions of articles or drawings relating to natural and cultural resource management and research in the park. They can be sent to:  
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