



Science in the Crown

Documenting Cultural Use of Chief Mountain

Native people have maintained living relationships with the majestic landscape features of Waterton-Glacier International Peace Park for millennia. Many of the mountains, lakes, and valleys of the area hold religious and spiritual significance and have long been used for ritual and ceremonial purposes. The massif of Chief Mountain, which lies on the eastern boundary of Glacier National Park and is less than 5 miles from the Canadian border, is one of those special, sacred places.

While not the highest peak in the area, Chief Mountain stands ahead of the other mountains on the eastern edge of the Rockies and looks out over the plains. The most prominent peak along the Front Range, it can be seen for hundreds of miles around, from the highlands southeast of Calgary to the Sweetgrass Hills of eastern Montana. The mountain is jointly managed by Glacier National Park and the Blackfoot Tribe as it lies directly on the boundary between the park and the reservation to the east.

Betty Matthews, a member of the Blackfoot Tribe and an employee of the Tribal Preservation Office, undertook a study in 2005 to determine past and present use of Chief Mountain by the Blackfoot People. With a Master of Science degree in Anthropology that focused on the cultural and economic conflicts associated with European colonization of the area, Ms. Matthews was uniquely qualified to undertake the study.

Twelve interviews were conducted with representatives from three of the four Blackfoot bands: five interviews were carried out with the Southern Piegan, five with the Northern Piegan, and two with the Blood Tribe. Much of the information was given in traditional story form. Several themes emerged from the interviews that involve traditional use of the mountain, how it fits into Blackfoot culture and worldview, and



Chief Mountain is sacred to the Blackfoot People. Betty Matthews, with the Blackfoot Tribal Historical Preservation Office, undertook an oral history study in 2005 to document traditional cultural use of the mountain by tribes of the Blackfoot Confederacy in the U.S. and Canada

thoughts that people have about how the area can be better managed.

Some concern was raised in several of the interviews about trying to separate just one mountain and area from others. All land is sacred and all mountains are known to have power.

Nonetheless, Chief Mountain does hold special significance. It is considered the oldest spirit of any of the mountains and creation stories of the Blackfoot People are linked to it. Some believe there is an old man's spirit living in Chief Mountain. Thunder resides in the mountain and Thunder Pipe Medicine always refers to it. Brings Down the Sun received his bundle here, which contains the sacred power of thunder. Thunder

brings an annual renewal of life to people.

Other information shared pertained to plants and animals in the areas and the proper preparation for seeking guidance at Chief Mountain. People were willing to share information at this time because it is important toward reclaiming lost spiritual and religious knowledge for the Blackfoot people.

The interviewees also want to see more effort toward protecting the mountain from vandalism and casual use. Contact the CCRLC for full report. This project was funded by the International Conservation Programs Office (National Park Service).

USGS Scientist Focuses on Impacts of Global Climate Change on Mountain Ecosystems



Dr. Daniel Fagre, an ecologist at the Glacier Field Station of the USGS Northern Rocky Mountain Science Center, received the 2005 Director's Award for Natural Resource Research from the National Park Service. Dan studies the impacts of climate change to park resources. Dan has served both the USGS and the NPS for 14 years. As the Station's Global Change Research Coordinator, his research has focused on developing the ability to explain, quantify,

and predict what changes will occur in parks and protected areas with the onset of global climate change and other environmental stressors. Dan's research activities include glacier monitoring, forest modeling, spatial changes in alpine vegetation patterns, watershed research, and atmospheric research with a host of collaborators.

Dan has documented the shrinking of Glacier's glaciers within the past 150 years. He has also created predictive models about the size and the existence of the glaciers in the future. According to these models, all glaciers in the park are likely to be gone within the next 25 years if current warming trends persist. He has recently initiated more rigorous monitoring and studies of these glaciers.

Dan has created vegetation models based upon one likely climate scenario for Glacier NP for next 50 years (30% increase in precipitation and slight increase in average annual temperature). These models predict the expansion of cedar-hemlock forests in the valley bottoms and rises in the elevation of

treeline. There is also a predicted increase in the frequency of large, stand-replacing forest fires.

Dan has looked into the past to better understand the future. Tree-ring research, conducted with MSU scientists, has revealed that long droughts of 20-40 years duration are not uncommon over the past 500 years. These droughts have influenced the size of glaciers and the frequency of forest fires.

While Dan's research program focuses on Glacier National Park, his work is coordinated with mountain research in western North America and throughout the world. Dan's work is recognized internationally. He is also an important contributor to the management of the International Peace Park. Recent research on snow avalanches, for instance, has helped with predicting unstable snow conditions and scheduling work on the spring opening of the Going-to-the-Sun Road.

Red Bikes Rule in Glacier

Glacier's Red Bike Program, funded by the Glacier Fund, provides 21 bikes for National Park employees to utilize for work or recreation trips and supports the park's environmental stewardship goals. Billie Thomas, clerk for the CCRLC, coordinates the Red Bike program. The bikes, which are only used within park boundaries, provide an alternative to driving a vehicle for short trips, thereby saving fuel. Fuel consumption and pollution output are greater during short trips; they are much higher in the first minute or two after a cold start than when the engine has

achieved normal operating temperatures. Preventing cold starts has a greater impact on air quality than preventing longer-distance driving.

Red Bikes have been placed at office buildings, visitor centers, campgrounds, and ranger stations. Park staff have used red bikes for campground monitoring. Bikes outfitted with baskets are used to collect fees and monitor campgrounds, avoiding the visual and aural impacts of a vehicle. Visitors complimented employees for using the red bikes. Keys for

accessing the bikes are obtained at West Lakes District warehouse and Hudson Bay District Office.



Jack Potter, Chief of Division of Science and Resources Management, rides a red bike.

Grant- Kohrs Ranch Hosts Teacher Workshop

The Crown of the Continent Research Learning Center collaborated with Grant- Kohrs Ranch National Historic Site to develop and hold a workshop for elementary school teachers. The three- day workshop was held July 20- 22, 2005. Teachers learned about the connections between natural and cultural environments at Grant- Kohrs Ranch, how natural resources of the west have provided the foundation for U.S. ranching heritage, and about the importance of maintaining healthy ecosystems in the state of Montana.

Teachers heard from a broad range of experts, including NPS natural and cultural resource specialists, education specialists, research

scientists, and a retired high school biology teacher. Through a combination of classroom exercises and field activities participants learned about how Grant- Kohrs Ranch was established, the role the ranch played in the history of western ranching and development along the Clark Fork Watershed, past and current grazing practices, and current issues with noxious weeds and natural vegetation communities. Other associated contemporary issues were discussed such as water rights, riparian health, and the ecology and management of riparian and grassland birds.

A notebook of lesson plans and ideas for

other classroom activities were offered to the teachers. Teachers also created their own lesson plans based upon what they learned during this course. Teachers were able to receive graduate credit from the University of Montana. The workshop was funded by Rocky Mountain CESU.



Waterton- Glacier Science and History Conference

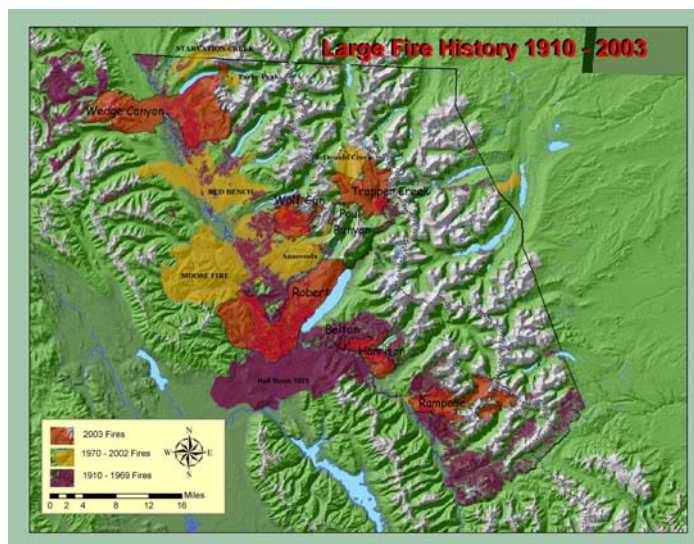
Waterton- Glacier International Peace Park held its 2nd Annual Science and History Conference on Thursday, August 18, at the Lake McDonald Lodge Auditorium, from 8:30 a.m. until 4:30 p.m. The conference was free of charge and open to the public; 135 people attended. The conference featured 14 presentations from investigators of ongoing or recently completed research projects in Glacier and Waterton Lakes National Parks. The 20- minute presentations covered a wide variety of topics including bear research, climate change and avalanche prediction, paleoclimate studies, fisheries and floodplain dynamics, wildlife and fire ecology studies, and historical and cultural research projects. Public response to the non- technical presentations was very positive and the plan is to make this an annual event. See Upcoming Projects and Events for more information on the summer 2006 conference.

Glacier National Park Fire Atlas

Fire managers are required to input, update, and maintain fire information in multiple local and national databases. This information is also needed for a range of decision support models. Several inefficiencies exist in the current data infrastructure.

The National Center for Landscape Fire Analysis (NCLFA) has designed and developed a local geodatabase for Glacier National Park, using MS Access, which reduces redundancy and allows fire

managers to directly enter fire start information into a GIS format. Fire managers began using the tool in spring 2005 and are currently collaborating with the NCLFA to incorporate other features into the program, such as the ability to model fire history and integrate other data sets (e.g. vegetation, weather, fuels) and define their relationship with fire history. The project is funded through the National Center for Landscape Fire Analysis at the University of Montana.



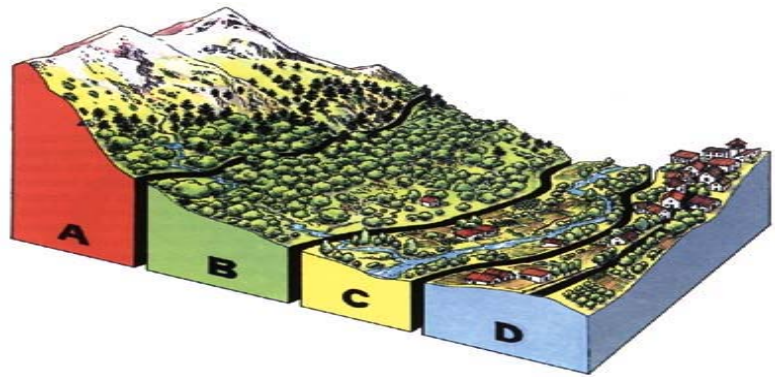


International VIP Compares Glacier- Abruzzo Grizzly Bears

Gabriele Mastrilli, a Master's student in Ecology and Biogeography from the University of Palermo, Italy, undertook a study to compare grizzly bear management between Glacier NP and Abruzzo Lazio & Molise National Park (Italy). Gabrielle volunteered in Glacier from August 19 until October 11, 2005. He met with wildlife biologists John Waller and Steve Gniadek, biological science technicians Deb Elwood and Clay Miller, and USGS research ecologist Katherine Kendall. Upon completion of his study in Glacier, Gabrielle produced a report and a PowerPoint presentation of his work.

often closed during the summer months and at other times allow restricted access where visitors are permitted only on trails and on foot and sometimes only accompanied by a park ranger (see A in figure below) to regions that allow multiple use activities such as grazing, tree cutting, and horseback riding and hiking only on trails (B) and ones that allow traditional agricultural activities like grazing and livestock breeding (C) to inhabited regions that include villages, historical centers, campgrounds, picnic areas, wildlife viewing and study areas, visitor centers, nature trails and environmental education centers (D). "The development of these management subdivisions was fundamental to permitting the co-existence of humans and nature," Gabriele Mastrilli said.

Abruzzo NP's management technique divides the park into four zones ranging from the most protected regions of the park that are



A. Highly Protected. B. Multiple Use. C. Agricultural Use. D. Development

Chinese Scientist Visits Peace Park

Dr. Zhang Yingyi, a conservation biologist from Beijing, China spent seven days working with Research Learning Center staff and park biologists on transboundary resource management issues. Dr. Zhang works for Fauna and Flora International (www.fauna-flora.org), an international conservation organization that has been in existence for over 100 years. She is an expert on the black gibbon (*Nomascus concolor*), an endangered species found in China, Laos, and Vietnam. During her visit, Dr. Zhang met with a range of ecologists and natural resource managers with expertise and jurisdiction in the Crown of the Continent Ecosystem. She was especially interested in some of the grass roots efforts at resource conservation that are taking place in the Flathead Valley and participated in a public meeting in Kalispell of the Flathead Coalition, an international group concerned with protecting water quality in the Flathead drainage basin.



National Park Service
U.S. Department of the Interior

Crown of the Continent Research Learning Center
Glacier National Park
PO Box 128
West Glacier, MT 59936

Leigh Welling, Director
Sallie Hejl, Resource Education Specialist
Billie Thomas, Administrative Assistant

Phone: 406-888-5827
Web address:
www.nps.gov/glac/learningcenter/learningcenter.htm

Research Learning Centers increase the effectiveness and communication of research and science results in the national parks.

Upcoming Projects & Events

Crown Managers Partnership Annual Forum

The Crown Managers Partnership Annual Forum will be held in Lethbridge, Canada March 1- 3, 2006. The partnership seeks to build awareness of common issues among jurisdictions in the Crown and to improve relationships and opportunities for transboundary collaboration.

2nd Year for Citizen Science Loon Project

The Glacier Fund is supporting the second year of the CCRLC's Common Loon project. CCRLC will build upon the success of the pilot program and create a more robust determination of loon population health in 2006 by starting earlier in the spring and following the loons throughout the breeding season.

2006 Waterton-Glacier Science and History Conference

The 3rd Annual Science and History Conference for Waterton- Glacier International Peace Park will be held July 27, 2006 in Waterton Lakes NP. Contact the CCRLC for more details.