

PART III.

Professional Support Programs

This section summarizes the 2005 accomplishments of YCR staff who provide services for other YCR branches and park divisions:

- Spatial Analysis Center
- Resource Information Team
- Research Permit Office
- Servicewide Benefits-Sharing EIS
- Funding and Personnel Support



Former Yellowstone Superintendent Bob Barbee at the 8th Greater Yellowstone Biennial Scientific Conference.

Spatial Analysis Center

The Spatial Analysis Center (SAC) is responsible for the park's geographic information systems (GIS), global positioning systems (GPS), image analysis systems, soil information support, and a resource database. The main tasks are the acquisition, analysis, organization, storage, maintenance, and presentation of data, especially concerning Yellowstone's cultural and natural resources. The goals are to maintain an up-to-date GIS lab, provide GPS equipment and expertise to park staff and improve their GPS and GIS skills, and repackage technology and technical data to meet internal and external needs.

In 2005, staff enhanced the role of service providers by participating on intra-divisional teams focused on specific priorities. This included working on the park's three major search and rescue efforts during the year; mapping water, sewer, and electric systems; contributing to the power line right-of-way; participating on the Tower ID team; and working with GYA partners to create fire history and fire fuel maps for the area.

The summer of 2005 was the eighth field season of digitally mapping the park's thermal features. With data collected from an additional 994 features, the database now contains information about approximately 9,900 thermal features in areas throughout the park. This database provides the only way for park staff and outside researchers to identify individual thermal features that have specific combinations of temperature and pH.

Research Permit Office

The Research Permit Office carries out four primary responsibilities consistent with National Park Service policies:

- responds to inquiries about and issues permits for research projects that include fieldwork in Yellowstone
- monitors the fieldwork associated with scientific studies in a variety of disciplines to ensure that it does not negatively affect park resources or conflict with other park goals or missions
- encourages research in Yellowstone and provides logistical support where possible
- collects and appropriately disseminates the results of park-related scientific studies to the widest possible audience

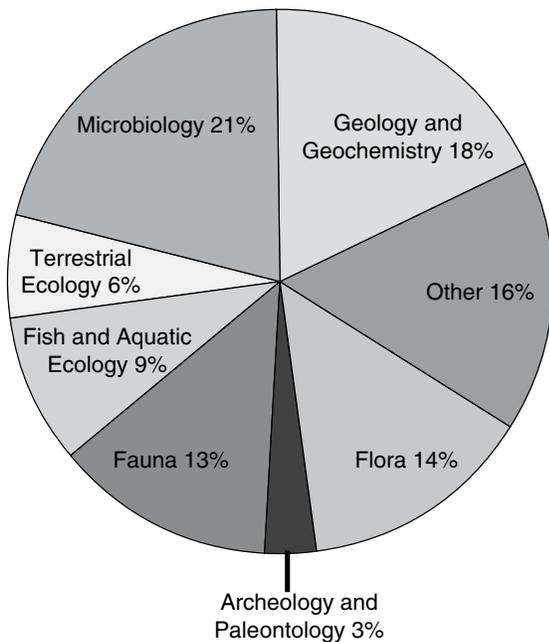
During 2005, staff issued 221 research permits to scientists from 40 of the United States and 9 foreign countries. In addition to permits issued as renewals of ongoing studies, 43 requests for new projects were approved by Yellowstone's Research Review Team, which was 30% more new projects than in 2004. An additional 30 scientists inquired about conducting research in Yellowstone but did not pursue obtaining a permit.

Staff accompanied approximately 10% of the researchers during their fieldwork, which not only helps prevent harm to park resources, but enhances understanding of the scientists' research needs. Working with the researchers, staff often discover

better ways to record data or collect samples, while minimizing any potential negative affects on resources. These ideas for “best practices” are documented and passed on to park staff and other researchers when applicable.

Although Yellowstone is widely known for its abundant wildlife and unique geothermal features, scientific research is conducted in a wide range of subject areas, as shown in the pie chart below.

Staff received reports from 42 investigators who had concluded their project and submitted their



research findings and publications to the park. To disseminate the results of research studies to research scientists, park employees and managers, and the public, during 2005 staff scheduled five presentations on research projects and distributed more than 500 journal articles, theses, and research reports to interested parties.

Here is a more detailed breakdown of topics addressed by research projects in 2005.

Air quality	1
Archeology	4
Climate/Weather	2
Ecology-Aquatic	5
Ecology-Terrestrial	13
Entomology	8
Exotic Plants and Animals	7
Fisheries	8
Forestry/Fire Ecology	9
Geochemistry	17
Geography/GIS	7
Geology	22
Herpetology	2
Mammalogy	25
Microbiology	49
Natural Soundscapes	1
Ornithology	1
Other	11
Paleontology	3
Plant communities	18
Sociology	5
Water Quality	3



Researcher Bruce Fouke sampling at Angel Terrace.

Benefits-Sharing EIS

Biological research associated with the development of commercial products that is undertaken in natural environments has become known as bioprospecting. In 1997, the NPS adopted a policy to manage bioprospecting as a defined subunit within the research permitting system that the parks have used for more than a century. The NPS also decided to manage bioprospecting with monetary and non-monetary benefits-sharing requirements if commercially viable products were anticipated. Opponents of this policy sued the NPS in federal court on the grounds that bioprospecting constituted a new commercial activity that was illegal and inappropriate in NPS units. In 1999, the court ordered the NPS to review the policy under NEPA. The resulting draft EIS analyzes the range of policy options deemed reasonable by the NPS.

With assistance from the DOI Office of the Solicitor and the Assistant U.S. Attorney's Office, the NPS responded successfully to ongoing litigation in Washington, D.C., federal court over an October 2002 FOIA. In August 2005, the plaintiff sent another large FOIA request asking for more than three years' worth of project records. The NPS contested the fee-waiver request for this FOIA and the case is under review by the Solicitor's Office.

Two drafts of the EIS were prepared and reviewed for adherence to NEPA. The final NPS internal review of the draft EIS was completed in the fall of 2005. Congressional briefings by the NPS are planned for spring 2006 and the final EIS is expected to be completed in 2007.

Resource Information Team

The mission of the Resource Information Team is to translate, produce, and synthesize scientific and technical information of all kinds into language and formats that are accessible to researchers, other agency scientists, self-selected members of the public, and park managers who need access to results from scientific research in order to make informed decisions about park issues. Through presentations, events, printed and electronic publications, and outreach efforts, staff strive to increase the informed discussion of park issues and policies by a variety of interested participants; contribute to

the scientific body of knowledge about the park; and promote resource conservation and visitor enjoyment through accessible dissemination of scientific knowledge about the park.

Despite a staffing reduction, personnel worked toward those goals in 2005 by producing four issues of *Yellowstone Science* magazine; planning a Research Learning Center website with support from the Yellowstone Park Foundation and Canon U.S.A., Inc.; organizing and hosting the 8th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, *Greater Yellowstone Public Lands: A Century of Discovery, Hard Lessons, and Bright Prospects*; and producing a variety of high quality materials in support of YCR and other divisions.

Yellowstone Science magazine

In 2005, the quarterly journal *Yellowstone Science* entered its thirteenth year with two full-color issues and articles on a wide range of topics highlighting many aspects of Yellowstone's natural and cultural resources.

Four issues were published and distributed to a subscription readership of nearly 2,500 individuals and institutions. Among the highlights this year was a very popular winter issue devoted to the tenth anniversary of wolf restoration, and a fall issue that explored the park's new Heritage and Research Center. Other feature stories this year included a look at art and conservation in Yellowstone; the history of the Canyon Hotel; a study of the presence and ecology of lynx and snowshoe hares in the park; an investigation of elk calf mortality that offered somewhat surprising results (cited in a November *USA Today* article on the same topic); a history of the park's first general store; an interview with the park botanist; and a story on the Yellowstone super-volcano and its portrayal in the media.

8th Biennial Scientific Conference

Greater Yellowstone Public Lands: A Century of Discovery, Hard Lessons, and Bright Prospects, possibly the most immediately pragmatic Biennial Scientific Conference to date, focused on the mandates, "cultures," relationships, and accomplishments of the numerous local, state, and federal management agencies responsible for Greater Yellowstone's public lands. Staff planned and organized the event with the help of other YCR staff



There were 20 posters displayed at the 8th conference.

and a program committee of independent scholars and non-Yellowstone federal agency personnel. It was sponsored by 11 local academic and non-profit institutions and federal agencies.

The conference, held October 17–19, 2005, at the Mammoth Hot Springs Hotel, set yet another attendance record, with 209 registered attendees. Featured speakers were USFS Chief Dale Bosworth, former chief Jack Ward Thomas, Canadian conservationist Harvey Locke, Sarah Boehme of the Buffalo Bill Historical Center’s Whitney Gallery of Western Art, landscape ecologist Dr. Monica Turner, former NPS Intermountain Region director Karen Wade, and wildlife conservation professor Dr. Richard Knight. There were also sessions on history, mammals, biocomplexity, water resources, fire, human values, native plants, trophic cascade questions, and the history and current challenges of the Greater Yellowstone Coordinating Committee, all with a cross-agency or cross-boundary perspective. More than 70 papers, panels, and posters were presented; major themes included interagency cooperation, community-based conservation, and the importance of training scientists and managers to express themselves clearly, and to perceive of their audience as consisting of far more than other scientists.

Other scientific publications

Other annual publications included four issues of the *Buffalo Chip* newsletter, the *2004 YCR Annual Report*, the *2004 Wolf Project Annual Report*, the *2004 Yellowstone Bird Report*, and the *2004 Yellowstone Fisheries and Aquatic Sciences Annual Report* all of which were edited and designed by resource information staff. Special publications included the production of “The Ecology of Bison Movements and Distribution in and Beyond Yellowstone National Park: A Critical Review with Implications for Winter Use and Transboundary Population Management,” by respected Canadian wildlife biologist and NPS contractor Cormack Gates.

Greater Yellowstone Science Learning Center

The primary focus of the Greater Yellowstone Science Learning Center (GYSLC), a partnership between the Yellowstone Center for Resources, the Yellowstone Park Foundation, and Canon U.S.A., Inc., and part of the *Eyes on Yellowstone* is made possible by Canon program, is to promote mission-oriented research in the Greater Yellowstone Inventory and Monitoring Network (Yellowstone and Grand Teton national parks and Bighorn Canyon National Recreation Area), explain the need for and results of research in the network to park managers, researchers, students, and interested public, and to help develop the network’s Vital Signs monitoring plan.

A proposal was developed and funding secured for this extensive web-based project. Planning meetings were held, web pages were designed, and staff began to develop content for the website prototype in the form of resource almanacs and overviews, reference lists, and lists of laws and other management documents. The site can be visited at www.greateryellowstonescience.org.

Assistance and Support

During 2005, staff drafted letters and remarks for the park superintendent; made resource-related presentations at the park’s seasonal orientation; read and commented on more than 20 manuscripts for Yellowstone-related books and articles (in addition to *Yellowstone Science* and *Buffalo Chip* submissions); designed a brochure and a series of aquatic invasive warning signs for the Aquatics Section; created informational handouts on research permitting and

the benefits-sharing EIS; reviewed publications for the Division of Interpretation as requested; drafted updates on the park's status as a World Heritage site; provided technical assistance and Government Printing Office guidance to other divisions; edited the park's Historic Resource Study, volume III (History of Administrative Structures); compiled and submitted the park's submission for the NPS *Natural Resource Year in Review*; edited the interagency paleontology report, *Cretaceous Complexities: The Stratigraphic Intricacies of Mount Everts*; edited and designed a pamphlet detailing the archeology program's activities at Osprey Beach; attended a planning workshop for the *Atlas of Yellowstone* project; re-designed a conference poster for vegetation staff; and maintained the YCR scanning station for use by park staff.

Public Involvement and Volunteer Support

Resource information staff were grateful for the help of Lia Lawson, who volunteered approximately 160 hours to RIT projects, including the design for a series of signs for the Aquatics Section, and creating flyers for the 8th Biennial Scientific Conference and the Heritage and Research Center open house.

Funding and Personnel

Base Operating Budget

Superintendent Suzanne Lewis and Deputy Superintendent Frank Walker approved a base operating budget of \$4,364,100 for the Yellowstone Center for Resources on February 4, 2005, for FY05. The increase of \$375,700 over FY04 funding levels that was included in this budget was specifically earmarked for implementing and maintaining a geothermal monitoring program. The base operating budget accounted for 63% of YCR's total for FY05. This compares to an average of 60% for the period FY95–FY04.

Additional Funding

Recreation Fee Demonstration Funds. Although the fee demo program did not provide funds for any new resource management projects in FY05, it did make \$167,700 available to continue some ongoing projects: rare books restoration, northern range

riparian studies, a geothermal features inventory, a whirling disease survey, and two fisheries conservation projects. Since YCR began receiving fee demo money in 1997, this program has allocated about \$1.7 million for 18 different projects.

Fishing Fee Program. The YCR received authorization to use \$342,300 from fishing permit fee revenue to cover part of the estimated \$942,000 cost of the aquatic resources program in FY05.

Federal Lands Highway Program. Federal Highways funded \$495,900 for natural resource inventories, archeological surveys, and resource compliance along the road corridors in the park scheduled for major repair or reconstruction in the near future.

Special Emphasis Program Allocation System. The Branch of Cultural Resources successfully competed for a total of \$696,900 in special emphasis program funding that was used to procure and install specialized storage units for the museum, archives, and library collections in the Heritage and Research Center facility; stabilize three historic buildings (Fort Yellowstone and Lamar); maintain the historic vehicles collection; continue ethnographic resource inventory, traditional use, and research studies; and undertake two cataloging projects.

The special emphasis program also provided \$218,000 for the Branch of Natural Resources to conclude the elk calf mortality study begun in FY03, finalize the survey results for Canada lynx, and begin a three-year study of the declining pronghorn antelope population.

Other Park Service Funds. YCR continued work on two planning projects in FY05 that were supported with funds from the servicewide level of the National Park Service: the Benefits-Sharing EIS (\$287,000) and the Brucellosis Vaccine EIS (\$80,000).

Other Federal Funds. Most of these funds were provided by the Greater Yellowstone Coordinating Committee (\$22,000). The GYCC elected to fund three Yellowstone projects in FY05: two aquatic resources projects relating to native cutthroat trout conservation and a trumpeter swan assessment. Yellowstone also received GYCC funds for participation in two Greater Yellowstone Area projects: development of a fire history and fuel model mapping project for wildland fire applications, and pro-

duction of a summary report of GYCC projects.

Private Funds. A total of \$181,300 was donated to the park by private organizations or individuals in support of various YCR projects, including whirling disease surveys, restoration of westslope cutthroat trout, Yellowstone cutthroat trout conservation efforts, wolf recovery program operations, an experimental electronic data collection project (Eyes on Hayden), the Tauck World Discovery volunteer program for historic structures conservation, a collection condition survey, and a feasibility proposal for the Greater Yellowstone Science Learning Center. Most of this funding (\$133,500) came through the Yellowstone Park Foundation. The Montana Whirling Disease Initiative provided \$40,900.

Personnel

In an effort to control costs and channel diminishing funds to the highest priority position vacancies parkwide, Yellowstone's management team set up the Position Management Review Board (PMRB) in November 2003. The Board reviewed all requests to fill vacant permanent positions in the park through July 2005. Of the approximately 84 vacancies that were considered during this period, 27 were recommended for indefinite lapse. This process helped ensure that work was organized and assigned among positions in a manner serving the park's core mission most effectively and economically.

Of the 232 personnel actions processed by YCR in FY05, these were of special note:

- On January 3, 2005, Wayne Brewster, Deputy Director of the Yellowstone Center for Resources, retired after 35 years of federal service in the U.S. Army, USFWS, and NPS. Brewster came to work for Yellowstone in 1991 from Glacier National Park, where he had worked on wolf and grizzly recovery since 1988. In Yellowstone, Brewster was the regional lead for wolf recovery planning for all parks, then took on a laborious and frustrating multiple-agency Bison Management Plan and EIS. His influence and talents made an extraordi-

nary difference on some of North America's most popular wildlife. He and his wife, Lil, moved to Helena, Montana, where they plan to enjoy their horses and the beauty of the Montana landscape for many years to come.

- YCR's Senior Writer-Editor Roger Anderson was permanently assigned the responsibilities of the Chief of Cultural Resources (vice-Consolo Murphy) and promoted in October 2004 based on an accretion of duties.
- Administrative Support Assistant Colleen Watson accepted a promotion to the lead Budget Analyst position with the Division of Interpretation and left YCR at the end of November 2004.

As a result of PMRB decisions, three YCR positions were left vacant after these changes: the Deputy Director position, a Writer-Editor position, and an Administrative Support Assistant position.

Total employment on YCR activities was equivalent to 76 full-time employees for FY05 (Appendix 1, FTEs). This was slightly less than the FTE count for FY04, but more than for any other prior year. The average FTE for the period FY95–FY04 was 56.

Other Administrative Activities

Assistance Agreements. Staff processed 50 assistance agreements and task orders in FY05, totaling obligations of \$925,300, of which 54% was used for administration of the Montana Water Compact and geothermal monitoring plan. Other significant investments were made in archeological surveys and evaluations, research in support of winter use studies, aquatic resources studies, historic structures stabilization assistance, and research on the riparian habitats of Yellowstone's northern range.

Procurement Actions. Staff processed 783 procurement actions in FY05, totaling approximately \$1,143,900.

Clerical Support. Staff processed 954 pieces of correspondence and 345 travel authorizations in FY05.

Funding history (FY 1993-05), Center for Resources, Yellowstone National Park (new allocations only)

YCR Base Increase	FY	National Park Service Funds											Other Federal	Private	Total
		Park Base	Nat Res Project Funds	Cult Res Project Funds	Fish Fee	FLHP	Fee Demo	Other NPS							
	93	1,004,600	16,000	-	-	-	-	-	-	-	-	785,000	188,000	20,000	2,013,600
245,400	94	1,250,000	260,000	33,200	65,000	43,300	-	-	-	-	-	320,600	79,600	10,000	2,061,700
250,000	95	1,500,000	420,000	45,000	65,000	303,600	-	-	-	-	-	59,800	20,000	5,300	2,418,700
44,100	96	1,544,100	404,000	201,100	274,500	626,700	-	-	-	-	-	157,800	65,000	31,500	3,304,700
130,000	97	1,674,100	204,000	228,400	213,400	433,700	340,000	42,700	-	-	-	398,300	398,300	48,000	3,582,600
571,500	98	2,245,600	130,500	242,100	284,800	330,800	31,000	24,000	-	-	-	65,300	65,300	37,700	3,391,800
286,300	99	2,531,900	-	221,900	285,000	396,500	298,000	152,900	-	-	-	105,200	105,200	56,700	4,048,100
36,700	00	2,568,600	237,500	101,000	280,000	214,900	631,000	1,418,000	-	-	-	41,300	41,300	52,700	5,545,000
93,300	01	2,661,900	297,000	216,700	285,100	409,000	-	-	-	-	-	15,000	15,000	85,500	3,970,200
772,900	02	3,434,800	293,000	198,700	261,900	293,200	6,000	-	-	-	-	11,700	11,700	126,400	4,625,700
(16,100)	03	3,418,700	101,000	326,300	250,000	431,000	103,000	454,400	-	-	-	24,000	24,000	224,300	5,332,700
569,700	04	3,988,400	92,600	470,400	332,600	623,500	133,000	855,000	-	-	-	22,400	22,400	229,200	6,747,100
375,700	05	4,364,100	218,000	676,900	342,300	495,900	167,700	367,800	-	-	-	23,700	23,700	181,300	6,837,700

YCR distribution of FY05 funds (including carryover)

Cultural Resources	796,100	1,000	-	-	-	35,100	33,200	287,800	3,000	24,300	1,180,500
Natural Resources	2,986,300	217,000	-	342,300	203,800	143,200	143,200	80,000	20,700	142,800	4,136,100
Professional Support	581,700	-	676,900	-	257,000	34,000	-	-	-	14,200	1,563,800
Total:	4,364,100	218,000	676,900	342,300	495,900	210,400	367,800	23,700	181,300	6,880,400	

APPENDIX I.

Personnel Roster, 2005

Professional Support Branch			FTE	Borrowed FTE
Management and Administration				
1.	Brewster, Wayne	Deputy Director	0.26	
2.	Cline, Barbara	Division Secretary	1.00	
3.	Deutch, Ann	Environmental Protection Assistant	0.59	
4.	Hendrix, Christie	Environmental Protection Assistant	1.00	
5.	McAdam, Melissa	Sprv. Budget Analyst	1.00	
6.	Mills, Sue	Environmental Protection Specialist	1.00	
7.	Perius, Joy	Budget Analyst	1.00	
8.	Smith, Christine	Administrative Support Assistant	0.86	
9.	Varley, John	Director	1.00	
10.	Watson, Colleen	Administrative Support Assistant	0.15	
11.	Whiteside, Marlene	Maintenance Worker	-	0.02
		<i>subtotal Management & Admin:</i>	7.86	0.02
Resource Information Team				
1.	Blackford, Tami	Technical Writer-Editor	0.99	
2.	Franke, Mary Ann	Technical Writer-Editor	0.26	
3.	Schullery, Paul	Resource Naturalist	0.44	
4.	Stevenson, Sarah	Technical Writer-Editor	0.12	
5.	Warner, Virginia	Editorial Assistant	0.98	
6.	Wondrak Biel, Alice	Technical Writer-Editor	1.00	
		<i>subtotal Resource Information:</i>	3.79	-
Spatial Analysis Center				
1.	Bonzey, Nick	Cartographic Technician	0.29	
2.	Campbell, Erin	Cartographic Technician	0.15	
3.	Friedel, Rob	Cartographic Technician	0.23	
4.	Guiles, Carrie	Cartographic Technician	0.84	
5.	Jurak, Mike	Cartographic Technician	0.19	
6.	Miller, Steve	Physical Science Technician	0.28	
7.	Napoli, Jim	Cartographic Technician	0.38	
8.	Nock, Erin	Cartographic Technician	0.23	
9.	Rodman, Ann	Sprv. GIS Specialist	1.00	
10.	Santoro, Andrea	Cartographic Technician	0.23	
11.	Savage, Shannon	GIS Specialist	0.94	
		<i>subtotal Spatial Analysis:</i>	4.76	-
Professional Support Branch FTE:			16.41	0.02

			FTE	Borrowed FTE
Cultural Resources Branch				
1.	Anderson, Roger	Chief of Cultural Resources	1.00	
2.	Capozzi, Maria	Museum Technician	0.64	
3.	Case, Bridgette	Museum Technician	0.79	
4.	Curry, Colleen	Museum Curator	1.00	
5.	Dawson, Herb	Historic Architect	0.99	
6.	Edmiston, Sarah	Library Technician	0.25	
7.	Faggen, Peter	Museum Technician	0.27	
8.	Felton, Tasha	Cultural Resources Technician	0.95	
9.	Hale, Elaine	Archeologist	0.96	
10.	Hinckley-Cole, Maurine	Administrative Support Assistant	0.93	
11.	Housley, Harold	Archivist	1.00	
12.	Housley, Sara	Center Clerk	0.05	
13.	Johnson, Ann	Archeologist	0.99	
14.	Reid, Charissa	Cultural Anthropologist	0.14	
15.	Schumacher, Michael	Archeology Technician	0.19	
16.	Sucec, Rosemary	Cultural Anthropologist	0.96	
17.	Tustanowski-Marsh, Steve	Museum Technician	0.12	
18.	White, Katie	Cultural Resources Assistant	0.35	
19.	Whittlesey, Lee	Historian	1.00	
20.	Historic Structures	Preservation Projects Assistance (Maint.)	-	2.44
Cultural Resources Branch FTE			12.58	2.44

Natural Resources Branch

Natural Resources Administration

1.	Olliff, Tom	Chief of Natural Resources	1.00	
2.	Wyman, Becky	Administrative Support Assistant	1.01	
3.	Winter Use	Monitoring Assistance (RMVP & Maint.)		
<i>subtotal NR Admin FTE:</i>			2.01	0.97

Fisheries and Aquatic Resources

1.	Arnold, Jeff	Ecologist	0.99	
2.	Bigelow, Pat	Fishery Biologist	0.95	
3.	Bywater, Tim	Administrative Support Assistant	0.13	
4.	Doepke, Phil	Biological Science Technician	1.00	
5.	Erickson, Jeremy	Biological Science Technician	0.43	
6.	Ertel, Brian	Biological Science Technician	0.91	
7.	Facendola, Joe	Biological Science Technician	0.54	
8.	Hutchinson, Hunter	Biological Science Technician	0.26	
9.	Johnson, Krisinda	Biological Science Technician	0.08	
10.	Jones, Michael	Biological Science Technician	0.03	
11.	Kavanagh, Maureen	Biological Science Technician	0.06	

		FTE	Borrowed FTE
12.	Keep, Shane	Biological Science Technician	0.06
13.	Koel, Todd	Sprv. Fishery Biologist	1.00
14.	Legere, Nicole	Biological Science Technician	1.00
15.	Mahony, Dan	Fishery Biologist	1.00
16.	McKinney, Mary	Administrative Support Assistant	0.31
17.	Naughton, Joe	Biological Science Technician	0.42
18.	Olson, Kevin	Biological Science Technician	0.44
19.	Olszewski, Brad	Biological Science Technician	0.54
20.	Romankiewicz, Chris	Biological Science Technician	0.42
21.	Rowdon, Barb	Biological Science Technician	0.09
22.	Schamberry, Nicole	Biological Science Technician	0.42
23.	Sefton, Melinda	Maintenance Worker	-
			0.08
24.	Sigler, Stacey	Biological Science Technician	0.50
25.	Swanke, Denice	Administrative Support Assistant	0.58
26.	Varian, Anna	Biological Science Technician	0.43
27.	Wethington, Don	Small Craft Operator	0.59
	<i>subtotal Aquatic Resources FTE:</i>	13.18	0.08

Geology and Physical Sciences

1.	Brickl, Melissa	Physical Science Technician	0.18	
2.	Heasler, Hank	Geologist	1.00	
3.	Iobst, Ben	Physical Science Technician	0.15	
4.	Jaworowski, Cheryl	Geologist	0.96	
5.	Miller, Steve	Physical Science Technician	0.25	
6.	Ross, Tara	Sprv. Park Ranger	-	0.01
	<i>subtotal Geology FTE:</i>	2.54	0.01	

Vegetation Management

1.	Anderson, Heidi	Botanist	0.83	
2.	Hektner, Mary	Resource Management Specialist	1.00	
3.	Klaptosky, John	Biological Science Technician	0.76	
4.	Pecha, Vicki	Biological Science Technician	0.84	
5.	Renkin, Roy	Vegetation Management Specialist	1.00	
6.	Whipple, Jennifer	Botanist	0.89	
	<i>subtotal Vegetation FTE:</i>	5.32	-	

Wildlife Resources Team

1.	Billman, Hillary	Biological Science Technician	0.04	
2.	Blanton, Doug	Biological Science Technician	1.02	
3.	Chalfant, Danielle	Biological Science Aid	0.22	
4.	Coleman, Louise	Biological Science Technician	0.81	
5.	Coleman, Tyler	Biological Science Technician	0.51	
6.	Davis, Troy	Biological Science Technician	1.03	
7.	Dixon, Chris	Biological Science Technician	0.07	
8.	Geremia, Chris	Biological Science Technician	1.02	
9.	Guernsey, Deb	Biological Science Technician	0.97	

		<u>FTE</u>	<u>Borrowed FTE</u>
10.	Gunther, Kerry Wildlife Biologist	1.02	
11.	Jones, Jennifer Biological Science Technician	1.00	
12.	Jones, Tildon Biological Science Technician	0.97	
13.	McEneaney, Terry Wildlife Biologist	1.01	
14.	McIntyre, Rick Biological Science Technician	0.51	
15.	Miller, Steve Physical Science Technician	0.49	
16.	Murphy, Kerry Wildlife Biologist	0.97	
17.	Plumb, Glenn Sprv. Wildlife Biologist	1.00	
18.	Roberts, Lori Biological Science Technician	0.34	
19.	Simenson, Monty Horse Handler	-	0.47
20.	Smith, Doug Wildlife Biologist	1.01	
21.	Smith, Jeremiah Biological Science Technician	0.35	
22.	Stahler, Dan Biological Science Technician	0.97	
23.	Stroud, Janice Biological Science Technician	0.99	
24.	Thompson, Derek Biological Science Technician	0.27	
25.	Treanor, John Biological Science Technician	0.63	
26.	Wallen, Rick Wildlife Biologist	1.00	
27.	White, P.J. Wildlife Biologist	1.00	
28.	Wyman, Travis Biological Science Technician	1.05	
	<i>subtotal Wildlife FTE:</i>	20.27	0.47
Natural Resources Branch FTE:		43.32	1.53
TOTAL YCR FY05 FTE:		72.31	3.99



Bison management crew at the Mary Mountain cabin.

APPENDIX II.

Publications, Reports, and Papers

Professional Publications

- Bangs, E., M. Jimenez, C. Niemeyer, T. Meier, V. Asher, J. Fontaine, M. Collinge, L. Handegard, R. Krischke, D. Smith, and C. Mack. 2005. Livestock guarding dogs and wolves in the northern Rocky Mountains of the United States. *Carnivore Damage Prevention News* 8:32–39.
- Bangs, E. E., J. A. Fontaine, M. D. Jimenez, T. J. Meier, E. H. Bradley, C. C. Niemeyer, D. W. Smith, C. M. Mack, V. Asher, and J. K. Oakleaf. 2005. Managing wolf-human conflict in the northwestern United States. Pages 340–356 in *People and wildlife: conflict or coexistence?* R. Woodroff, S. Thirgood, and A. Rabinowitz, eds. (Cambridge, England: Cambridge University Press).
- Barber, S. M., L. D. Mech, and P. J. White. 2005. Yellowstone elk calf mortality following wolf restoration: bears remain top summer predators. *Yellowstone Science* 13(3):37–44.
- Berger, J. and D. W. Smith. 2005. Restoring functionality in Yellowstone with recovering carnivores: gains and uncertainties. Pages 100–109 in *Large carnivores and the conservation of biodiversity* J. C. Ray, K. H. Redford, R. S. Steneck, and J. Berger, eds. (Washington, D.C.: Island Press).
- Bradley, E. H., D. H. Pletscher, E. E. Bangs, K. E. Kunkel, D. W. Smith, C. M. Mack, T. J. Meier, J. A. Fontaine, C. C. Niemeyer, and M. D. Jimenez. 2005. Evaluating wolf translocation as a non-lethal method to reduce livestock conflicts in the northwestern United States. *Conservation Biology* 19:1498–1508.
- Channing, A., M. Schweitzer, J. Horner, and T. McEneaney. 2004. A silicified bird from Quaternary hot spring deposits. *Proceedings of the Royal Society of London, Series B*, doi:10.1098/rspb.2004.2989:1–7.
- Christie, R. J., R. Hansen, R. Wallen, and S. Olsen. 2005. Deliver at a distance: ballistics for wild bison live *Brucella* vaccination. *Controlled Release Society Newsletter* 22:7.
- Fortin, D., H. L. Beyer, M. S. Boyce, D. W. Smith, T. Duchesne, and J. S. Mao. 2005. Wolves influence elk movements: behavior shapes a trophic cascade in Yellowstone National Park. *Ecology*. 86(5), 1320–1330.
- Franke, M. A. 2005. *To Save the Wild Bison: Life on the Edge in Yellowstone* (Norman, Okla.: University of Oklahoma Press).
- Garrott, R. A., J. A. Gude, E. J. Bergman, C. Gower, P. J. White, and K. L. Hamlin. 2005. Generalizing wolf effects across the Greater Yellowstone Area: a cautionary note. *Wildlife Society Bulletin* 33:1245–1255.
- Haroldson, M. A., K. A. Gunther, D. P. Reinhart, S. R. Podruzny, C. Cegelski, L. Waits, T. Wyman, and J. Smith. 2005. Changing numbers of spawning cutthroat trout in tributary streams of Yellowstone Lake and estimates of grizzly bears visiting streams from DNA. *Ursus* 16(2):167–180.
- Herrero, S., T. Smith, T. D. DeBruyn, K. Gunther, and C. A. Matt. 2005. Brown bear habituation to people—safety, risks, and benefits. *Wildlife Society Bulletin* 33(1):362–373.

- Mao, J. S., M. S. Boyce, D. W. Smith, F. J. Singer, D. J. Vales, J. M. Vore, and E. M. Merrill. 2005. Habitat selection by elk before and after wolf reintroduction in Yellowstone National Park. *Journal of Wildlife Management* 69(4):1691–1707.
- McEneaney, T. 2004. A Whooper Swan (*Cygnus buccinator*) at Yellowstone National Park, Wyoming, with comments on North American reports of the species. *North American Birds* 58(2):301–308.
- . 2005. Rare color variants of the Trumpeter Swan. *Birding* (37) 2, 148–154.
- Murphy, K. M., T. Potter, J. Halfpenny, K. Gunther, T. Jones, and P. Lundberg. 2005. The elusive Canada lynx: surveying for Yellowstone's most secretive threatened carnivore. *Yellowstone Science* 13(2):7–15.
- Smith, D. W. 2005. Mixed messages about opportunistic carnivores. *Conservation Biology* 19:1676–1678.
- . 2005. Ten years of Yellowstone wolves 1995–2005. *Points West*, Spring 2005, 3–10.
- . 2005. Ten years of Yellowstone wolves, 1995–2005. *Yellowstone Science* 13(1): 7–33.
- Smith, D. W., and G. Ferguson. 2005. *Decade of the wolf: returning the wild to Yellowstone* (Guilford, Conn.: The Lyons Press).
- Vucetich, J. A., D. W. Smith, and D. R. Stahler. 2005. Influence of harvest, climate, and wolf predation on Yellowstone elk, 1961–2004. *Oikos* 11:259–270.
- Wallen, R., and G. Plumb. 2004. Implementation of the Interagency Bison Management Plan by Yellowstone National Park. *United States Animal Health Association 108th Annual Meeting Proceedings*, 108:197–201.
- White, P. J., and R. A. Garrott. 2005. Northern Yellowstone elk after wolf restoration. *Wildlife Society Bulletin* 33:942–955.
- . 2005. Yellowstone's ungulates after wolves—expectations, realizations, and predictions. *Biological Conservation* 125:141–152.
- White, P. J., D. W. Smith, J. W. Duffield, M. Jimenez, T. McEneaney, and G. Plumb. 2005. Yellowstone after wolves—Environmental Impact Statement predictions and ten-year appraisals. *Yellowstone Science* 13(1):34–41.
- Whittlesey, L. 2005. G.L. Henderson: interpreter and innovator, and the Henderson family today. *Yellowstone Science* 13(2): 20.
- . 2005. Lost in the Yellowstone: Truman Everts's thirty-seven days of peril (Spokane, Wash.: Books in Motion).
- Whittlesey, L., and H. Heasler. 2005. A guide to making proposals for place names of thermal features in Yellowstone National Park, Wyoming-Montana-Idaho: a National Park Service document. *GOSA Transactions IX*, January 2005, 193–195.

Administrative Reports

- Anderson, C., K. Aune, K. Barber, D. Byornlie, S. Cherry, K. Frey, K. Gunther, L. Hanauska-Brown, M. Haroldson, R. Harris, K. Keating, D. Moody, C. Schwartz, C. Servheen, and G. White. 2005. Reassessing methods to estimate population size and sustainable mortality limits for the Yellowstone grizzly bear. (Bozeman, Mont.: U.S. Geological Survey).
- Clarke, R., C. Jourdonnais, J. Munding, L. Stoeffler, and R. Wallen. 2005. Interagency bison management plan for the state of Montana and Yellowstone National Park: a status review of adaptive management elements. <<http://www>.

- nps.gov/yell/technical/planning/bison/bmpstatusreview.pdf>.
- Gunther, K. A. 2004. Yellowstone National Park recreational use. Page 51 in *Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2004*, C. C. Schwartz and M. A. Haroldson, eds. (Bozeman, Mont.: U.S. Geological Survey).
- Gunther, K. A., M. T. Brusolino, S. L. Cain, K. Frey, L. Hanauska-Brown, M. A. Haroldson, and C. C. Schwartz. 2005. Grizzly bear-human conflicts in the Greater Yellowstone Ecosystem. Pages 57–60 in *Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2004*, C. C. Schwartz and M. A. Haroldson, eds. (Bozeman, Mont.: U.S. Geological Survey).
- Gunther, K. A., T. Wyman, T. M. Koel, P. Perrotti, and E. Reinertson. 2005. Spawning cutthroat trout. Pages 34–38 in *Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2004*, C. C. Schwartz and M. A. Haroldson, eds. (Bozeman, Mont.: U.S. Geological Survey).
- Gunther, K. A., and T. C. Wyman. 2005. Yellowstone National Park 2004 annual report of activities conducted under endangered species subpermit #87-1. (Mammoth Hot Springs, Wyo.: U.S. Department of the Interior, National Park Service, Bear Management Office, Yellowstone National Park), 10pp.
- Heasler, H. November 2, 2004. An assessment of human-caused damage to Artesia Geysers, Firehole Lake Drive, 7 pp.
- . June 21–22, 2005. Preliminary results of a dye tracer test on Sylvan Pass. 4 pp.
- . September 7, 2005. An update of turbidity and discharge measurements for the Mammoth Crystal Springs hydrologic system, Yellowstone National Park, May 8, 2005, to August 24, 2005. 20 pp.
- Heasler, H., and C. Jaworowski. February 28, 2005. Investigation of shallow ground water movement in the immediate area of the Old Faithful Visitor Center. 48 pp.
- . May 18, 2005. Reconnaissance of the near-surface hydrology of the Sylvan Pass area, Yellowstone National Park. 34 pp.
- Heasler, H., C. Jaworowski, M. Brickl, and B. Iobst. August 8, 2005. Results of turbidity and discharge measurements for the Mammoth Crystal Springs hydrologic system, Yellowstone National Park, May 9, 2005, to July 25, 2005. 29 pp.
- Jaworowski, C. 2005. East Fork of Specimen Creek: A pictorial journey 2005. 6 pp.
- Jaworowski, C., and H. Heasler. January 2005. Geological assessment of the Malin Creek site. 34 pp.
- . January 11, 2005. Drainage along the Road to Artist's Point. 5 pp.
- . September 2005. Erosion along the North and South Canyon Rims. 11 pp.
- Johnson, A. M. 2005. Cultural Resource Inventory for the Norris Government Housing Wildland-Urban Interface Project, Norris Junction (Yellowstone National Park, Wyo.: National Park Service, Yellowstone Center for Resources).
- Koel, T. M., J. L. Arnold, P. E. Bigelow, P. D. Doepke, B. D. Ertel, and D. L. Mahony. *Yellowstone fisheries and aquatic sciences: annual report 2004* (Yellowstone National Park, Wyo.: National Park Service, Yellowstone Center for Resources), YCR-NR-2005-03.
- McEneaney, T. 2005. *Yellowstone bird report 2004* (Yellowstone National Park, Wyo.: National

Park Service, Yellowstone Center for Resources)
YCR-NR-2005-01.

Podruzny S., and K. Gunther. 2005. Spring ungulate availability and use by grizzly bears in Yellowstone National Park. Pages 30–33 in *Yellowstone grizzly bear investigations: annual report of the Interagency Grizzly Bear Study Team, 2004*, C. C. Schwartz and M. A. Haroldson, eds. (Bozeman, Mont.: U.S. Geological Survey).

Smith, D. W., D. R. Stahler, and D. S. Guernsey. 2005. *Yellowstone Wolf Project: annual report, 2004*. (Yellowstone National Park, Wyo.: National Park Service, Yellowstone Center for Resources) YCR-NR-2005-02.

Story, M., J. Shea, T. Svalberg, M. Hektner, G. Ingersoll, and D. Potter. 2005. Greater Yellowstone Area Air Quality Assessment Update, November 2005, Greater Yellowstone Clean Air Partnership. <www.nps.gov/yell/publications/pdfs/airquality/GYA_AirQuality_Nov_2005.pdf>.

Yellowstone Center for Resources. 2004. Yellowstone Center for Resources annual report, fiscal year 2003. National Park Service, Mammoth Hot Springs, Wyoming, YCR-AR-2003.

Yellowstone Center for Resources. 2005. Yellowstone Center for Resources annual report, fiscal year 2004. National Park Service, Mammoth Hot Springs, Wyoming, YCR-2005-03.

Information Papers

The following Bear Management Office Information Papers were written or updated during 2005:

Gunther, K. A. 2005. Bears and menstruating women. Information Paper No. BMO-7. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 2pp.

———. 2005. Bear management area program, Yellowstone National Park. Information Paper No. BMO-5. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 4pp.

———. 2005. Food habits of grizzly bears and black bears in the Yellowstone Ecosystem. Information Paper No. BMO-3. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 3pp.

———. 2005. Recovery parameters for grizzly bears in the Yellowstone ecosystem. Information Paper No. BMO-6. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 4pp.

———. 2005. Where are all the bears? Information Paper No. BMO-4. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 2pp.

———. 2005. Yellowstone National Park bear-related injuries/fatalities. Information Paper No. BMO-1. U.S. Department of the Interior, National Park Service, Yellowstone National Park. 2pp.

APPENDIX III.

Partnerships

Standing Partnerships

YCR staff contribute to regional, national, and international stewardship efforts by participating in the following ongoing partnerships:

Absaroka Divide Cooperative Wildlife Working Group

Partners: Shoshone National Forest, Wyoming Game and Fish Commission

Mission: to increase knowledge of species and habitats in the Absaroka Mountains along the east boundary of Yellowstone National Park, promote resource management activities, and encourage an interagency approach to problem solving and data collection and sharing

Commitment: Member agencies collaborate on wildlife monitoring and other projects inside and outside the park.

YCR representatives: P.J. White

2005 highlights: The group developed a Memorandum of Understanding to facilitate collaboration and initiated cooperative monitoring of ungulates.

Consultation with American Indian Tribes

Partners: 26 park-affiliated American Indian tribes and an additional 50 tribes that are specifically interested in bison management issues

Mission: interagency consultation with the goal of enabling the park to manage its cultural and natural resources in a culturally informed manner

Commitment: Each spring, tribes are invited for a full day's meeting to hear about the most pressing management issues in natural and cultural resources. A welcoming potluck is held, and field trips are usually offered.

YCR representative: Rosemary Sucec

2005 highlights: The park hosted a consultation meeting on May 19.



Participants in food storage box test conducted at Grizzly Discovery Center, West Yellowstone.

Ethnographic Resources Inventory (ERI) National Data Standards and Implementation Committee

Partners: NPS members include the Chief Ethnographer; Archeology and Ethnography Program Manager; representatives from the Alaska, Midwest, Northeast, and Southeast regions; the Olympic National Park ethnographer

Mission: to assess use of the ERI system, identify any needed changes, consider interface with other servicewide data systems, and address operational and conceptual needs as they arise

Commitment: telephone conference calls every quarter and on an as-needed basis, attendance at NPS ethnographers' annual meeting

YCR representative: Rosemary Sucec

2005 highlights: We continued to try new beta versions of the software and worked with the contractor who developed it to make the necessary changes.

Federal Highways Road Team

Partner: Federal Highway Administration

Mission: to ensure context-sensitive design in the

reconstruction of the park's historic roads and compliance with the National Environmental Policy Act and Endangered Species Act

Commitment: weekly conference calls, two 4-day sessions walking the road corridor along each segment to be reconstructed, winter meetings

YCR representatives: Mary Hektner, Elaine Hale

2005 highlights: The road construction project from Sylvan Pass to the East Entrance won the 2005 overall best project award from the Western Federal Lands Highway Administration.

Greater Yellowstone Area Clean Air Partnership

Partners: Grand Teton National Park; Gallatin, Custer, Beaverhead, Shoshone, Bridger-Teton, and Targhee national forests; Red Rock Lakes National Wildlife Refuge; Idaho National Environmental and Energy Laboratory; Montana, Idaho, and Wyoming Departments of Environmental Quality

Mission: to advise the Greater Yellowstone Coordinating Committee on air quality issues and to facilitate air quality program coordination and the implementation of consistent air quality management strategies

Commitment: annual meeting

YCR representative: Mary Hektner

2005 highlights: The YCR hosted the 9th annual meeting and participated in a major update of the 1999 GYA Air Quality Assessment.

Greater Yellowstone Bald Eagle Working Group

Partners: GYA state and federal government agencies, and non-governmental organizations

Mission: Established in 1982, this group monitors bald eagle productivity and other information.

Commitment: communications via e-mail

YCR representative: Terry McEneaney

Greater Yellowstone Peregrine Falcon Working Group

Partners: two peregrine falcon groups, the states of Montana and Wyoming, and the Peregrine Fund

Mission: to continue to facilitate the recovery of the peregrine falcon in the GYA

Commitment: Wyoming has an informal working group, with coordination done over the telephone.

Montana has a more formalized working group with an annual meeting.

YCR representative: Terry McEneaney

Greater Yellowstone Interagency Brucellosis Committee (GYIBC)

Partners: USDA Animal and Plant Health Inspection Service; states of Montana, Wyoming, and Idaho; InterTribal Bison Cooperative

Mission: to facilitate the development and implementation of brucellosis management plans that will sustain the free-ranging elk and bison populations in the GYA and protect the public interests and economic viability of the livestock industry in Idaho, Wyoming, and Montana

Commitment: The NPS is represented on the executive committee by the Associate Regional Director for Natural Resources and Science. YCR provides a representative for the technical subcommittee. Meetings are typically held three times a year.

YCR representative: Wayne Brewster

2005 highlights: The InterTribal Bison Cooperative was invited to participate as a non-voting member of the Executive Committee. Discussions continued to update the MOU for another five-year period.

Greater Yellowstone Trumpeter Swan Working Group

Partner: Greater Yellowstone Area agencies

Mission: to collect annual population and production data on trumpeter swans in the Greater Yellowstone Area

Commitment: Management activities are communicated between agencies at meetings.

YCR representative: Terry McEneaney

Harlequin Duck Working Group

Partner: U.S. and Canadian state, federal, and provincial agencies

Mission: to share harlequin duck information

YCR representative: Terry McEneaney

Integrated Science in Central Yellowstone

Partners: Montana State University, California State University–Monterey Bay

Mission: to build an integrated and multidisciplinary research program with the goal of advancing our

knowledge of the central Yellowstone ecosystem, supporting sound natural resource management, and communicating our knowledge and discoveries to the visiting public to enhance their experience and enjoyment of the park

Commitment: YCR is a full partner and has committed resources and staff for the project duration.

YCR representative: P.J. White

2005 highlights: We conducted a one-day symposium "Integrated Science in Central Yellowstone" at The Wildlife Society conference in Madison, Wisconsin. The program attracted more than \$500,000 in matching funds for ungulate-related activities and analyses regarding Yellowstone during FY 2005.

Interagency Bison Management Plan

Partners: USDA Animal and Plant Health Inspection Service; state of Montana Fish, Wildlife and Parks and Department of Livestock

Mission: to carry out the provisions of the 2000 plan which is designed to maintaining a wild, free-ranging bison population while minimizing the risk of transmitting the disease Brucellosis from bison to domestic cattle on public and private lands in Montana adjacent to YNP

YCR representative: Rick Wallen, Glenn Plumb

2005 highlights: Five-year status review completed.

Interagency Grizzly Bear Study Team

Partners: USGS Biological Resources Discipline; USFS; states of Idaho, Montana, and Wyoming

Mission: to conduct research needed to provide information for immediate and long-term management of grizzly bears inhabiting the GYE

Commitment: two to six meetings annually, which typically range from one to two days each

YCR representative: Kerry Gunther

2005 highlights: IGBST members provided managers with pertinent information on grizzly bear survival, mortality, cub production, population estimates, key foods, habitat, and conflicts with humans.

McLaren Mill Mine Tailings and Great Republic Smelter Reclamation

Partner: Montana Department of Environmental Quality

Mission: to address the potential reclamation of the McLaren Mill and Mine tailings sites and other water quality issues in the Cooke City, Montana, area

Commitment: meeting participation

YCR representative: Mary Hektner

2005 highlights: The USFS and EPA completed clean-up of the Republic site, and the USFS reclaimed the portion of the McLaren Mill site on USFS property. The sites were recontoured and revegetated.

Mid-sized Carnivore Inventory and Research

Partner: U.S. Forest Service

Mission: to improve research and inventory-related studies on mid-sized carnivores in the Greater Yellowstone Ecosystem

Commitment: 20 workdays

YCR representative: Kerry Murphy

2005 highlights: We constructed 28 wolverine live traps at sites distributed across the 3,500-mi² study area that will be set beginning in January 2006.

Montana Bird Records Committee

Partners: various government agencies

Mission: to review new and rare bird records, and to keep current on advances in ornithology

YCR representative: Terry McEneaney

Montana Compact Technical Oversight Committee

Partners: Montana Water Rights Compact Commission, NPS Water Resources Division

Mission: to oversee administration of the Montana Water Rights Compact, which was established in 1994 to protect geothermal features by limiting groundwater withdrawal in a designated area north of the park

YCR representative: Hank Heasler

2005 Highlights: The committee successfully lobbied Congress for funding to implement a comprehensive geothermal monitoring plan for Yellowstone.

Montana Fluvial Arctic Grayling Workgroup

Partners: Montana Fish, Wildlife and Parks

Mission: This group develops short- and long-term goals and works toward the restoration of populations in the upper Missouri basin.

Commitment: a one-day meeting each year plus any

required field activities

YCR representative: Todd Koel

2005 highlights: Yellowstone National Park has initiated research to determine the status of fluvial arctic grayling within the Gibbon River system.

National Partnership for the Management of Wild and Native Coldwater Fisheries

Partners: federal and state agencies, professional associations, and private advocacy organizations concerned with the status of wild and native fisheries in the United States

Mission: to provide leadership and recommendations for the Whirling Disease Initiative and the Montana Water Center

Commitment: one 3-day meeting each year

YCR representative: Todd Koel

2005 highlights: The Whirling Disease Initiative will continue to fund research projects with a focus on the development of tools to mitigate the effects of the disease.

Natural Resources Advisory Group

Partners: The group includes representatives from each NPS region, the central office, and field resources, and a superintendent.

Mission: to advise the Associate Director for Natural Resources, Mike Soukup, on servicewide issues

Commitment: annual meeting and between-meeting assignments

YCR representative: Tom Olliff

2006 highlights: This group met March 14–16 at Timucuan Ecological and Historical Preserve, Jacksonville, Florida. The group welcomed Bert Frost in his new role as Deputy Associate Director for Natural Resources (vice Abby Miller), discussed budget and project funding sources, GPRA/Strategic Planning goals, resource reporting (including Score Cards), and resource databases.

Neotropical Migrant Working Groups

Partners: Partners in Flight of Montana, Partners in Flight of Wyoming, Western Working Group Partners in Flight

Mission: They are currently focused on priori-

tizing species and developing conservation plans.

YCR representative: Terry McEneaney

New World Mining District Response and Restoration Project

Partners: USFS, EPA

Mission: to develop and implement certain response and natural resource restoration activities in the New World Mining District in conjunction with the states of Montana and Wyoming and public participation

Commitment: public and agency meetings related to the ongoing restoration work and review of USFS quarterly progress reports to Congress

YCR representative: Mary Hektner

2005 highlights: Environmental cleanup of the mining impacts is proceeding

Northern Yellowstone Cooperative Wildlife Working Group

Partners: Montana Fish, Wildlife and Parks; Gallatin National Forest; USGS-Northern Rocky Mountain Science Center

Mission: to protect the long-term integrity of the northern Yellowstone winter range by increasing knowledge of its species and habitats, promoting prudent land management activities, and encouraging an interagency approach to solving problems

Commitment: bi-annual meetings and work assignments on wildlife surveys and reports. Members share costs and duties for monitoring ungulates on the northern range inside and outside YNP.

YCR representatives: Glenn Plumb, P.J. White

2005 highlights: We completed cooperative counts and/or classifications of bighorn sheep, elk, pronghorn, mule deer, and mountain goats, the results of which were summarized in an annual report.

Northwest Level 1 Streamlining Group

Partners: federal land management agencies in Northwest Wyoming; U.S. Fish and Wildlife Service

Mission: to provide an expedited technical review of the effects of proposed agency projects on listed, proposed, and candidate species that are protected under the 1973 Endangered Species Act. Attendance at meetings helps YCR biologists identify and mini-

mize potential adverse effects of park activities on listed species, and greatly facilitates consultation with the U.S. Fish and Wildlife Service.

Commitment: two to four meetings per year

YCR Representative: Kerry Murphy

2005 Highlights: Murphy attended a meeting in Lander, Wyoming, and assisted Grand Teton National Park in hosting a workshop with the Canada lynx biological team in Moose, Wyoming.

Rocky Mountain Cluster Natural Resource Managers Group

Partners: Rocky Mountain Cluster NPS units

Mission: to discuss cluster resource issues and funding initiatives and receive updates on servicewide issues

Commitment: a two-day annual meeting

YCR representative: Tom Olliff

Snow Survey

Partner: Natural Resources Conservation Service

Mission: to collect snowpack and related climate information in order to monitor and help manage surface water supply derived from snowmelt in the higher mountainous areas of the West

YCR representative: Mary Hektner

Commitment: Ranger staff collect monthly snow depth and water content data January–May at five manual snow courses and 7 of 10 automated SNOTEL sites. YCR conducts resource inventories when site modifications are needed to install additional equipment.

Tauck Volunteer Program

Partners: Tauck World Discovery/Tauck Bridges

Mission: to give Tauck guests an opportunity to provide volunteer help on infrastructure preservation and maintenance projects, and to enable the park to complete projects that otherwise would not be done

Commitment: approximately one week per month during spring through fall, plus several days each month during winter

YCR representative: Herb Dawson

2005 highlights: Volunteers prepared and stained

eight employee cabins on the lower loop of the Old Faithful Lodge Cabin complex; prepared and log-oiled the Nez Perce Patrol Cabin; painted 110 fire hydrants at the Grant Village and Old Faithful developed areas; helped Maintenance personnel from the Grant subdistrict replace and stain log guardrails; cleaned the parking lot and picnic area at West Thumb Geyser Basin; and prepped and stained 500 bumper logs at campsites in the Bridge Bay Campground.

Virginia City National Historic Landmark District Stabilization Partnership

Partner: Montana Heritage Commission (MHC)

Mission: to administer the expenditure of a \$1.7 million NPS grant to the MHC and provide technical assistance and coordination with the MHC, the National Park Service, private consultants, contractors, and the Montana State Historic Preservation Commission

Commitment: three days per month

YCR representative: Herb Dawson

2005 highlights: The YCR representative reviewed plans for stabilization of the Prasch Blacksmith Shop, one of the oldest buildings in Virginia City, and oversaw stabilization of the Gilbert Brewery. New, low-impact technology called micro-piling is being used to core holes through the building, both vertically and horizontally, and then fiberglass rods are epoxied into the holes.

Wyoming Important Bird Area Technical Review Committee (WIBATRC)

Partner: Wyoming Audubon

Mission: The WIBATRC is responsible for reviewing, designating, and implementing important land tracts in Wyoming for bird conservation.

Commitment: meetings via conference call

YCR representative: Terry McEneaney

Wyoming Rare Plant Technical Committee

Mission: to coordinate activities between government agencies with rare plant responsibilities, and promote awareness of rare plants statewide

Commitment: two days per year

YCR representative: Jennifer Whipple (chair)

Yellowstone Volcanic Observatory

Partners: U.S. Geological Survey, University of Utah

Mission: to monitor Yellowstone for volcanic hazards and earthquakes using a network of seismic and GPS stations and provide real-time data to scientists and other interested persons at <http://volcanoes.usgs.gov/yvo>

YCR representative: Hank Heasler

2005 Highlights: A seismic station at Parker Peak and five continuous GPS stations were added to the network. YVO held a meeting in Salt Lake City to discuss a 10-year volcano and earthquake monitoring plan for YVO with scientists from the other four U.S. volcano observatories.



One-head pussytoes (*Antennaria monocephala* DC.), one of the native species added to the park's vascular plant list in 2005.

Project-based Partnerships

YCR staff enlist a variety of external partners from universities, federal and state agencies, non-governmental organizations, and private groups on a short-term basis to meet some of the park's specific resource stewardship objectives. These partnerships normally last one-to-three years, are formed to achieve specific objectives, and disband when the objectives are achieved. The following partnerships were active in 2005.

Note: A list of acronyms used in this table appears on page 79.

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Air, Land, and Water Resources	State of Montana (Department of Environmental Quality)	John Koerth (YCR: Mary Hektner)	Groundwater investigation for mine waste repository at McLaren tailings site	NPS-Water Resources Division	\$14,600
Aquatic Resources and Fisheries	Greater Yellowstone I&M Network	Dr. Todd Koel and Jeff Arnold (YCR)	Water quality monitoring	NPS I&M	\$26,371
Aquatic Resources and Fisheries	Greater Yellowstone I&M Network	Dr. Todd Koel (YCR)	Upper Snake River cutthroat trout inventory	NPS I&M	\$12,612
Aquatic Resources and Fisheries	Montana State University (Big Sky Institute)	Dr. Lisa Graumlisch (YCR: Dr. Todd Koel)	Yellowstone cutthroat trout watershed priorities	Yellowstone Park Foundation	\$46,389
Aquatic Resources and Fisheries	Montana State University (Ecology)	Dr. Thomas McMahon (YCR: Dr. Todd Koel and Brian Ertel)	Assessment of cutthroat trout of the upper Yellowstone River	Fish Fee	\$8,000
Aquatic Resources and Fisheries	Montana State University (Ecology)	Drs. Alexander Zale (YCR: Dr. Todd Koel)	Spatial dynamics of Arctic grayling in the Gibbon River	Fish Fee	\$33,460
Aquatic Resources and Fisheries	Montana State University (Ecology)	Lynn Kaeding (YCR: Dr. Todd Koel)	Yellowstone cutthroat trout recruitment related to stream temperature and flow	In-kind	Support as needed
Aquatic Resources and Fisheries	Montana State University (Ecology)	Dr. Billie Kerans (YCR: Dr. Todd Koel)	Examination of Yellowstone cutthroat trout infection risk as part of the Yellowstone NP whirling disease study	Fee Demonstration, Fish Fee	\$33,839
Aquatic Resources and Fisheries	Montana State University (Ecology)	Drs. Todd Koel (YCR), Dr. Billie Kerans, Silvia Murcia	Development and testing of risk assessment tools for whirling disease infection	MT/USFWS Whirling Disease Initiative	\$49,690
Aquatic Resources and Fisheries	Montana State University	Dr. Todd Koel (YCR), Gretchen Rupp	Use of high-resolution thermal imagery to locate <i>Tubifex tubifex</i> in Pelican Creek	MT/USFWS Whirling Disease Initiative	\$36,925

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Aquatic Resources and Fisheries	Montana State University	Dr. Todd Koel (YCR), Gretchen Rupp	Role of birds as a dispersal vector for whirling disease	MT/USFWS Whirling Disease Initiative	\$ 17,599
Aquatic Resources and Fisheries	Montana State University	Crystal Hudson (YCR: Dr. Todd Koel)	Laboratory assessment of Yellowstone cutthroat trout whirling disease infection	MT/USFWS Whirling Disease Initiative	\$ 12,914
Aquatic Resources and Fisheries	Sun Ranch (Madison Valley, Montana)	Roger Lang, Buddy Drake (YCR: Dr. Todd Koel)	Westslope cutthroat trout broodstock development	Fish Fee	\$5,000
Aquatic Resources and Fisheries	State of Wyoming (Fish and Game)	Steve Yekei, Jason Burckhardt (YCR: Dr. Todd Koel, Brian Ertel)	Life history of Yellowstone cutthroat trout of the upper Yellowstone River	Fish Fee	\$ 11,040
Aquatic Resources and Fisheries	State of Wyoming (Fish and Game)	Jim Barner, Steve Sharon (YCR: Dr. Todd Koel)	Establishment of Yellowstone cutthroat trout broodstock in Wyoming	In-kind	Staff support as needed
Aquatic Resources and Fisheries	University of Wyoming (Wyoming Cooperative Fish and Wildlife Unit)	Dr. Wayne Hubert (YCR: Dr. Todd Koel and Pat Bigelow)	Predicting lake trout spawning areas in Yellowstone Lake	ONPS-Lake Trout	\$29,268
Aquatic Resources and Fisheries	University of Wyoming (Zoology and Physiology)	Dr. Bob Hall, Dr. Todd Koel (YCR), Lusha Tronstad	Trophic consequences of lake trout and whirling disease invasion of Yellowstone Lake	In-kind	logistic support as needed
Aquatic Resources and Fisheries	USFS, GYCC	Mary Maj (YCR: Dr. Todd Koel)	Fine-spotted cutthroat assessment	GYCC	\$ 1,500
Aquatic Resources and Fisheries	USGS-FCRU	Dr. Al Zale (YCR: Dr. Todd Koel and Dan Mahony)	Status of Arctic grayling in the Gibbon River system	Fish Fee	\$40,000
Archeology	University of Wyoming (OWSA)	David Eckles, Elaine Hale (YCR)	Data recovery at Frying Pan Spring	FHWA	\$ 122,000
Archives	University of Colorado at Boulder (Library Administration)	Colleen Curry and Harold Housley (YCR)	Save America's Treasures: consolidation, inventory, and re-housing of Yellowstone NP's architectural drawings	NPS, National Endowment for the Arts, National Endowment for the Humanities	\$60,000
Bears	University of Calgary (Environmental Science), USGS (Alaska Biological Science Center), NPS Alaska Support Office, Alaska Fish and Game	Dr. Stephen Herrero, Tom Smith, Terry DeBruyn, Colleen Matt (YCR: Kerry Gunther)	Brown bear habituation to people: safety, risks, and benefits	University of Calgary, ONPS, Alaska Fish and Game	Participant salaries
Bears	USGS-BRD (IGBST)	Dr. Charles Schwartz, Mark Haroldson (YCR: Kerry Gunther)	Black bear demographics in Yellowstone NP	USGS, ONPS Base	As time is available

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Bears	USGS-BRD (IGBST), Montana Fish, Wildlife and Parks, Grand Teton National Park, Idaho Fish and Game	Kerry Gunther (YCR), Mark Haroldson, Kevin Frey, Steve Cain, Jeff Copeland, Dr. Charles Schwartz	Grizzly bear-human conflicts in the Greater Yellowstone Ecosystem	ONPS, USGS-BRD, State of Montana, State of Idaho	Participant salaries
Bears	USGS-BRD (IGBST), University of Idaho	Mark Haroldson, Dan Reinhart, Shannon Podruzny, Chris Cegelski, Lisette Wait (YCR: Kerry Gunther, Travis Wyman, Jeremiah Smith)	Estimates of grizzly bear numbers visiting Yellowstone Lake spawning streams	USGS-BRD, ONPS, University of Idaho	Participant salaries
Bears	Washington State University, USGS-BRD (IGBST), University of Idaho	Laura Felicetti, Dr. Charles Schwartz, Robert Rye, James Crock, Mark Haroldson, Lisette Waits, Charles Robbins (YCR: Kerry Gunther)	Use of naturally occurring mercury to determine the importance of cutthroat trout to Yellowstone grizzly bears	University of Washington, USGS-BRD, ONPS, University of Idaho	Participant salaries
Bears	Washington State University, USGS-BRD (IGBST)	Charles Robbins, Dr. Charles Schwartz, Robert Rye (YCR: Kerry Gunther)	Use of stable isotopes and trace elements to understanding effects of long-term changes in grizzly bear food resources	Yellowstone NP	\$6,500
Bison	Russian Federation Ministry of Health, USDA-ARS, Texas A&M University	Drs. Alexander Denisov, Glenn Plumb (YCR), Steven Olsen, and Gary Adams	Comparative studies of immunobiological characteristics of live brucellosis vaccines	U.S. State Department, Turner Foundation-Nuclear Threat Initiative	\$1,200,000
Bison	University of Calgary, University of Montana	Drs. Cormack Gates, Len Broberg, Glenn Plumb (YCR)	Bison movement and dispersal	NPS	\$339,212
Bison	U.S. Animal Health Association	Drs. Rick Willer, Bret Marsh, Glenn Plumb (YCR)	An initiative to enhance brucellosis vaccines, vaccine delivery, and surveillance diagnostics for bison and elk	NPS, USFWS, USGS-BRD, USDA-APHIS	\$150,000
Bison	Ballistic Technologies, Inc.	Rick Wallen (YCR), Dr. Rick Hansen	Accuracy of pneumatic remote delivery equipment	USGS-BRD (paid out in FY04), ONPS-Bison	\$96,000
Bison	Montana State University (Ecology)	Dr. Robert Garrott, Rick Wallen (YCR), Jason Bruggeman	Spatial dynamics of the central Yellowstone bison herd	Montana State University ONPS-Bison (paid in FY02)	\$92,000 \$72,000
Bison	Montana State University (Ecology)	Drs. Robert Garrott and P.J. White (YCR), Julie Fuller, Rick Wallen (YCR)	Bison demography in relation to groomed roads during winter	ONPS-Winter Use Monitoring (paid out in FY04)	\$49,000
Bison	USDA-APHIS	Rick Wallen (YCR), Dr. Ryan Clarke	Rate of brucellosis exposure in Yellowstone bison	USDA-APHIS, ONPS-Bison Management	\$26,000
Bison	University of Kentucky	Philip Crowley (YCR: John Treanor, Rick Wallen)	Affectos of vaccination on brucellosis prevalence	University of Kentucky (paid out in FY04) ONPS-Bison	\$5,000 \$20,500

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Bison	University of Montana	Fred Allendor (YCR: Rick Wallen)	Conservation genetics of bison	University of Montana (paid out in FY04) ONPS-Bison	\$45,000 \$5,875
Ethnography	Bear Creek Council	Rosemary Sucec (YCR)	Support for the potluck welcoming American Indian tribes to Yellowstone	Bear Creek Council, Yellowstone NP	in-kind
Ethnography	Nez Perce National Historic Trail, Confederated Tribes of the Colville Indian Reservation, Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe	Sandi McFarland (NPNHT), Linda Young (Division of Interpretation) (YCR: Rosemary Sucec)	Planning for 2006 meeting with tribal representatives and scholars to identify interpretive themes for Yellowstone segment of the trail	National Endowment for the Humanities via the Yellowstone Park Foundation	\$10,000
Ethnography	University of Montana	Greg Campbell (YCR: Rosemary Sucec)	Ethnographic Resources Inventory	CESU	\$5,000
Geographic Information Systems	Montana State University (Thermal Biology Institute), Western Oregon University, USGS, Portland State University, Idaho National Engineering & Environmental Laboratory, University of New Mexico	Drs. William Inskip, Sarah Boomer, Darrell Nordstrom, Anna-Louise Reyensbach, Frank Roberto, Cristina Takacs-Vesbach, Ann Rodman (YCR)	Create a research coordination network for geothermal biology and geochemistry in Yellowstone	National Science Foundation	\$100,000
Geographic Information Systems	University of New Mexico, Portland State University, USGS	Drs. Cristina Takacs-Vesbach, Anna-Louise Reyensbach, & Kirk Nordstrom, Ann Rodman (YCR)	A microbial inventory of Greater Yellowstone Ecosystem features	National Science Foundation	\$150,000
Geology	University of Utah (Geology and Geophysics)	Dr. Robert Smith (YCR: Dr. Henry Heasler)	Seismic and GPS monitoring of Yellowstone	ONPS-Geology	\$14,400
Geothermal	Montana State University	Dr. Rick Lawrence (YCR: Dr. Henry Heasler)	Detection of radiative thermal flux change	Montana State University	\$40,000
Geothermal	University of Montana	Carl Seielstad (YCR: Dr. Henry Heasler)	Thermal remote monitoring of Norris Geyser Basin	ONPS-Geology	\$40,000
Geothermal	USGS-Menlo Park, Yellowstone Volcano Observatory	Jake Lowenstern (YCR: Dr. Henry Heasler)	Geothermal gas monitoring	ONPS-Geology	\$14,500
Geothermal	Utah State University	Christopher Neale (YCR: Dr. Henry Heasler)	Mapping thermal springs in geyser basins	ONPS-Geology	\$64,954
Geothermal/ Montana Water Compact	State of Montana (Bureau of Mines and Geology)	Edmond Deal (YCR: Dr. Henry Heasler)	Controlled groundwater area <ul style="list-style-type: none"> Monitoring Database administration 	ONPS-Geology ONPS-Geology	\$25,534 \$141,000

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Geothermal/ Montana Water Compact	State of Montana (Natural Resources and Conservation)	Bud Clinch (YCR: Dr. Henry Heasler)	Yellowstone controlled groundwater area water rights administration	ONPS-Geology	\$23,000
Geothermal/ Montana Water Compact	USGS-WRD (Montana District)	Drs. Robert Davis (YCR: Dr. Henry Heasler)	Assess water discharge and selected chemical and physical parameters of waters in Yellowstone NP	USGS-WRD, ONPS-Geology	\$61,400
Geothermal/ Montana Water Compact	USGS-WRD (Utah District)	David Susong (YCR: Dr. Henry Heasler)	Hydrologic assistance in administering the compact and with other issues	USGS-WRD, ONPS-Geology	\$14,400
Historic Buildings	Montana Preservation Alliance	Chere Jiusto (YCR: Herb Dawson)	Stabilization of historic buildings in Yellowstone NP		\$88,151
Lynx Project	A Naturalist's World	Dr. Kerry Murphy (YCR), Dr. James Halpenny, Kerry Gunther (YCR)	Presence and distribution of lynx in Yellowstone	NPS, Yellowstone Park Foundation, National Fish and Wildlife Foundation	\$20,000
Museum	Montana State University Stanford University	Michael Cary (YCR: Colleen Curry)	Internship program for museum techs	Yellowstone Park Foundation	\$12,741 \$1,986
Natural Resources	Montana Conservation Corps	Mary Hektner (YCR)	Turbid Lake Road restoration	Canon U.S.A., Inc.	\$5,600
Research	University of Wyoming-NPS Research Center	Dr. Henry Harlow, Dr. Glenn Plumb (YCR)	Cooperative research program support	ONPS-Research	\$5,750
Spatial Analysis Center	Greater Yellowstone I&M Network	Ann Rodman (YCR)	NPSPECIES database: Invertebrates	NPS I&M	\$2,400
Vegetation	Colorado State University (Forest, Rangeland, and Watershed)	Dr. David Cooper (YCR: Mary Hektner)	Fens of YNP: identification, classification, geochemistry, floristics, and vegetation	Canon USA, Inc., ONPS-Vegetation	\$54,100 for 2-yr study; \$10,000 ONPS
Vegetation	Greater Yellowstone I&M Network	Rob Daley, Jennifer Whipple (YCR)	NPSPECIES database: Vascular Plant Certification	NPS I&M	\$5,440
Vegetation	Greater Yellowstone I&M Network	Jennifer Whipple (YCR)	Alpine plant inventory	NPS I&M	\$3,258
Vegetation	Montana State University (Biology)	Dr. Tad Weaver, Ken Aho (YCR: Mary Hektner)	Characterization of alpine vegetation on the northeast corner of YNP	ONPS-Vegetation	\$40,000 in FY99 ; \$6,500 in FY03
Vegetation	Montana State University (Center for Invasive Plant Management)	Janet Clark (YCR: Mary Hektner)	Conduct Gardiner Basin native vegetation/ungulate winter range restoration workshop	Yellowstone Park Foundation, GYCC, RM-CESU	\$17,500

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Vegetation	Oregon State University, University of Wisconsin at Stevens Point	Drs. William Ripple, Eric Larsen (YCR: Dr. Doug Smith, Roy Renkin)	Aspen regeneration on Yellowstone's northern range	ONPS	\$5,000
Vegetation	RM-CESU, Colorado State University	Drs. David Cooper, Tom Hobbs (YCR: Roy Renkin)	Persistence of willows on Yellowstone's northern range	ONPS-Vegetation, ONPS-Wildlife, Fee Demonstration	\$51,712
Vegetation	RM-CESU, Montana State University	Dr. Andrew Hansen, Lisa Baril (YCR: Roy Renkin, Terry McEneaney, Dr. Doug Smith)	Bird reponse to willow release on Yellowstone's northern range	Fee Demonstration	\$8,000
Vegetation	University of Montana (Flathead Biological Station), Yellowstone Ecological Research Center	Dr. Robert Crabtree (YCR: Roy Renkin)	Use of multispectral, remotely-sensed imagery to map willow distribution in northern Yellowstone	USGS-BRD, NRPP	\$20,000
Vegetation	USGS-BRD, Brigham Young University	Dr. Don Despain, Dr. Rex Cates (YCR: Roy Renkin)	Temperature influence on willow growth and phenolic production	ONPS-Vegetation, USGS Park-Oriented Biological Support, Fee Demonstration	\$44,250
Vegetation	USGS-BRD, University of Wisconsin-Stevens Point	Dr. Don Despain, Roy Renkin (YCR), John Klapotosky (YCR), Dr. Eric Larsen	Browse history of tree-sized aspen on Yellowstone's northern range	Fee Demonstration	\$19,134
Vegetation	USGS-BRD	Robert Stottlemeyer, Linda Zeigenfuss (YCR: Dr. P.J. White, Dr. Doug Smith, Roy Renkin)	Willow persistence and distribution following wolf reintroduction	USGS-BRD, NRPP	\$50,000
Vegetation/Wildlife	Natural Resources Conservation Service, Bridger Plant Center, Montana Conservation Corps	Mary Hektner (YCR)	Restore native vegetation/pronghorn habitat at HRC site	Yellowstone Park Foundation (Coin Fund), DOI Cooperative Conservation Initiative	\$108,000 (5-year project)
Wildlife	Idaho State University; USGS Amphibian Research and Monitoring Initiative	Dr. Chuck Peterson; Steve Corn	Amphibian Monitoring	NPS I&M	\$35,000
Wildlife	Montana State University (Ecology)	Dr. Robert Garrott (YCR: Dr. P.J. White)	Collaborative ungulate habitat and population monitoring	ONPS-Ungulates, Winter Use, Bison	\$31,400
Wildlife	University of Idaho	Drs. P.J. White (YCR), John Byers, Kerey Barnow-Meyer	Conservation of the declining Yellowstone pronghorn population	RM-CESU	\$15,000

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Wildlife	University of Minnesota (Fisheries and Wildlife), USGS-BRD	Dr. P.J. White (YCR), Dr. David Mech, Shannon Barber	Monitoring elk calf mortality	NRPP Natural Resources Management, USGS Park-Oriented Biological Support	\$58,000
Wildlife	University of Minnesota (Ecology)	Dr. Glenn Plumb (YCR), Dr. Craig Packer, Dan McNulty	Conduct wildlife research in conjunction with remote Canon cameras (Canon Eyes on Hayden Project)	Yellowstone Park Foundation/Canon, U.S.A., Inc.	\$96,000
Wildlife	University of Montana (Economics)	Dr. John Duffield (YCR: Dr. Glenn Plumb)	What price Yellowstone? The role of wolves in the regional economy	Yellowstone Park Foundation	\$144,000
Wildlife	University of Wyoming- Wyoming Natural Diversity Database	Gary Beauvais and Douglas Keinath	Ana Bat data analysis	NPS I&M	\$1,250
Wildlife	University of Wyoming- Wyoming Natural Diversity Database	Gary Beauvais and Douglas Keinath	NPSPECIES database: certification	NPS I&M	\$9,630
Wildlife	USGS-NPWRG	Jay Hestbeck (YCR: Dr. Glenn Plumb)	Trumpeter swan data analysis		\$7,000
Winter Use	Montana State University (Ecology)	Dr. P.J. White (YCR), Dr. John Borkowski, Dr. Scott Creel, Dr. Robert Garrott, Amanda Hardy	Motorized winter recreation and glucocorticoid stress responses in elk	ONPS-Winter Use Monitoring	\$4,500
Winter Use	Montana State University (Ecology)	Dr. Robert Garrott (YCR: Dr. P.J. White)	Evaluating the abundance, distribution, and stress hormones of ungulates in relation to winter human use in west-central Yellowstone NP	ONPS-Winter Use Monitoring	\$8,000
Winter Use	Montana State University (Mathematical Sciences)	Drs. John Borkowski, P.J. White (YCR), and Robert Garrott	Evaluating wildlife responses to motorized winter use in Yellowstone NP, 1998-2004	ONPS-Winter Use Monitoring	\$10,000
Winter Use	State of Montana (Department of Environmental Quality)	Elton Erp (YCR: Mary Hektner)	Air quality monitoring at West Entrance	ONPS-Winter Use Monitoring	\$2,890
Winter Use	USGS-WRD (Central Region, Denver)	George Ingersoll, Jeff Arnold (YCR)	Correlation of heavy metals deposition in snowpack and snowmachine use	ONPS-Winter Use Monitoring	\$15,000

Benefitting Program	Cooperator/ Partner	Contact/ Principal Investigator	Project	Fund Source	Amount
Wolverine Project	USFS-RMRS; Gallatin National Forest; Shoshone National Forest	Dr. Kerry Murphy (YCR)	Ecological assessment of wolverines in the Absaroka-Beartooths	YPF, USFS-RMRS, USFS Carnivore Program, RM-CESU, Gallatin National Forest, Shoshone National Forest	\$190,000
Yellowstone Center for Resources	California State University–Monterey Bay, Montana State University (Ecology)	Drs. Fred Watson, Robert Garrott, Susan Alexander (YCR); Dr. P.J. White and Rick Wallen)	Integrated natural science research program for the central Yellowstone ecosystem	NASA	\$2,500,000 (for 5 years)
Yellowstone Center for Resources	University of Oregon	Dr. Andrew Marcus, Jim Meacham, Ann Rodman (YCR)	Atlas of Yellowstone project	Yellowstone NP, University of Oregon	\$10,000
Yellowstone National Park	Montana State University (Big Sky Institute), U.S. Agency for International Development, Colorado State University, Montana Fish, Wildlife and Parks, Tanzania National Parks	Drs. Lisa Graumlich, Glenn Plumb (YCR), Robin Reid, Michael Coughenour, Kurt Alt, and Emmanuel Gereta	A proposal to strengthen collaborations between researchers and managers working in and around Yellowstone and Serengeti parks	U.S. Agency for International Development (Global Livestock Collaborative Research Program)	\$100,000

Acronyms

FHWA: Federal Highway Administration
GRYN: Greater Yellowstone Inventory and Monitoring Network
GYCC: Greater Yellowstone Coordinating Committee
IMR: Intermountain Region
NASA: National Aeronautics and Space Administration
NPS: National Park Service
ONPS: Operation of the National Park Service
ONPS-CRPP: Operation of the National Park Service-Cultural Resources Preservation Program
OWSA: Office of the Wyoming State Archaeologist
RM-CESU: Rocky Mountains Cooperative Ecosystem Studies Unit
USDA-APHIS: U.S. Department of Agriculture-Animal and Plant Health Inspection Service
USDA-ARS: U.S. Department of Agriculture-Agricultural Research Service
USFS: U.S. Forest Service
USFS-RMRS: U.S. Forest Service Rocky Mountain Research Station
USFWS: U.S. Fish and Wildlife Service
USGS: U.S. Geological Survey
USGS-BRD: U.S. Geological Survey Biological Resources Discipline
USGS-BRD (IGBST): U.S. Geological Survey Biological Resources Discipline, Interagency Grizzly Bear Study Team
USGS-FCRU: U.S. Geological Survey Fish Cooperative Research Unit
USGS-WRD: U.S. Geological Survey Water Resources Discipline
YCR: Yellowstone Center for Resources