Wildlife's Contribution to the Greater Yellowstone Regional Economy

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Consumptive Uses of Wildlife

An analysis of consumptive wildlife uses and their associated economic benefits in the Greater Yellowstone Region of Montana and Wyoming was conducted on the basis of the annual hunting effort and harvest reports by the states of Montana and Wyoming and the US Fish and Wildlife Service's 2001 National Survey of Fishing, Hunting, and Wildlife Associated Recreation. The data in these reports constrained the analysis in several ways:

- Only the following big game species were included in the analysis: elk, deer, antelope, moose, bighorn sheep, and black bear. This limitation was due primarily to data availability and complexity. Mountain goats, for example, are also considered a big game species; but reporting differences with respect to residency of hunters makes the data incompatible with that of the other, major species.
- Information contained in this section of the report was insufficient to calculate estimate variances or provide confidence intervals for the results. This report uses the word ***calculated*** to distinguish results from statistically valid estimates with corresponding measures of variance and confidence intervals.
- US Fish and Wildlife Service reports do not specify which species are considered big game species; the species included in the analysis are legally defined as big game in the states of Montana and Wyoming, and generally considered big game elsewhere. The assumption is that these species are included in the US Fish and Wildlife Service's definition.

Highlights of Results

The analysis resulted in the following calculated values:

1. Percent of ***big game*** hunters hunting in the Great Yellowstone Region:
   Wyoming
   - Residents 13.7%
   - Nonresidents 9.3%
   - All - Residents and Nonresidents 11.7%

   Montana
   - Residents 18.7%
   - Nonresidents 21.5%
   - All - Residents and Nonresidents 19.5%

2. Number of ***big game*** hunters hunting in the Great Yellowstone Region:
   Wyoming
   - Residents 8,220
   - Nonresidents 4,650

All - Residents and Nonresidents 12,870

Montana

Residents 29,359
Nonresidents 10,320
All - Residents and Nonresidents 39,679

3. 2001 Hunting trip and equipment expenditures of ***big game*** hunters hunting in the Great Yellowstone Region:

Wyoming

All - Residents and Nonresidents $12,107,780

Montana

All - Residents and Nonresidents $40,284,853

4. 2001 Hunting trip expenditures of ***big game*** hunters hunting in the Great Yellowstone Region:

Wyoming

All - Residents and Nonresidents $5,216,576

Montana

All - Residents and Nonresidents $21,255,081

5. Percent of total state harvest of ***big game*** that comes from the Great Yellowstone Region:

Wyoming

Residents 8.7%
Nonresidents 5.5%

Montana

Residents 14.9%
Nonresidents 10.8%

6. Total number of hunters (big game, small game, bird) hunting in the Great Yellowstone Region:

Wyoming

Residents 8,905
Nonresidents 6,324
All - Residents and Nonresidents 15,229

Montana

Residents 31,790
Nonresidents 12,685
All - Residents and Nonresidents 44,475

7. 2001 Hunting trip and equipment expenditures of hunters hunting in the Great Yellowstone Region:

Wyoming

Residents $11,330,376
Nonresidents $5,002,284
All - Residents and Nonresidents $16,332,660

Montana

Residents $37,225,575
Nonresidents $13,433,415
All - Residents and Nonresidents $50,658,990

8. 2001 Hunting trip and equipment expenditures of hunters hunting in the Great Yellowstone Region:

Wyoming

Residents	$4,879,137
Nonresidents	$4,656,789
All - Residents and Nonresidents	$9,535,926

Montana

Residents	$12,776,098
Nonresidents	$12,520,955
All - Residents and Nonresidents	$25,297,053

Calculating Consumptive Uses and Economic Benefits in the Greater Yellowstone Region

State Collected Information

Harvest and hunting statistics are routinely collected by the states of Wyoming and Montana. Both states use similar methods to manage big game hunting and to estimate the harvest and hunting effort:

- Each state is geographically divided into hunt areas that are generally unique to each species and can change from time to time.
- Hunt areas do not correspond to political boundaries, such as counties.
- Total harvest and hunting effort is estimated by randomly sampling license holders for each species. Estimates are made for the number of animals harvested and the number of hunters by residency – state residents and nonresidents - hunting in each hunt area.
- Because the sample unit for the states' harvest and hunting reports is the license holder, individual hunters may be counted several times if they have more than one license or hunt for a species in more than one area.

Both Wyoming and Montana have periodically conducted studies of expenditures and net economic values of hunting for various species (*references 1, 2, and 3*). These studies are problematic for several reasons:

- The sample unit is a license holder for a specific species and the economic information pertains only to trip expenses associated with hunting that species. The studies do not account for hunting equipment or other non trip related expenditures.
- The studies cover a 10 year span. While expenditures estimates can be standardized by adjusting for inflation over the time period, it is not possible to account for differences in hunting regulations, technology, or hunting patterns.

US Fish and Wildlife Service Collected Information

The US Fish and Wildlife Service periodically conducts national surveys of fish, hunting, and wildlife associated recreation. The latest version of the survey was conducted in the year 2001 (*references 10 and 11*):

- The number of resident and nonresident hunters and big game hunters are estimated for each state, and are broken down into big game, deer, elk, bear, wild turkey, and other big game.

Estimates are also made for small game and migratory bird hunting which was not considered in this analysis.

- The survey also collects estimates on the annual expenditures made by all resident and nonresident hunters, and by all big game hunters.
- The sample unit for the survey is an individual who is at least 16 years old.
- Reports and data from the survey are available only to the level of the state – information at the county or regional levels is not available.

Combining State and US Fish and Wildlife Service Information

The states provide the only information for estimating harvest and hunting effort in the Greater Yellowstone Region, while the US Fish and Wildlife Service's information provides better economic estimates. Thus, the decision was made to combine the two data sources to analyze consumptive uses.

Several steps were required to estimate the amount of hunting, big game harvest, and number of hunters that can be attributed to the Great Yellowstone Region:

1. Determine which hunt areas are located in the Greater Yellowstone Regions.

Hunt area maps for elk, deer, antelope, bighorn sheep, moose, and black bear obtained from both Montana and Wyoming (*references 4 and 13*) were overlaid with state county maps to identify the specific hunt areas located each Greater Yellowstone Region county.

2. Estimate the proportion of each hunt area within the Great Yellowstone Region

Wyoming Game and Fish provided an Excel spread sheet that identified each hunt area and the proportion of overlap with Park and Teton Counties. The values in the spreadsheet were generated by electronically overlaying the hunt area maps with the state county map. Similar information was not available from Montana Fish, Wildlife, and Parks, so the proportion of overlap of the hunt areas was estimated by eye for the Montana Counties of Carbon, Gallatin, Madison, and Park.

3. Estimate the annual hunting effort and harvest by species for the Greater Yellowstone Regions.

Both states publish annual big game harvest and hunting effort reports and post them on their internet web sites (*references 5, 6, 7, 8, 9, and 12*). Information from 2004 was available from Wyoming, while the most recent information from Montana was for the years 2003 and 2002. To estimate the annual hunting effort and harvest, the assumption was made that harvest and effort were distributed uniformly across each hunt area. The reported harvest and effort was multiplied by the proportion of the hunt area overlapping the counties within Greater Yellowstone Region, and summed up to estimate the annual big game effort and harvest.

4. Estimate total number of big game hunters utilizing the Greater Yellowstone Region.

The number of license holders reported statewide and estimated for the Greater Yellowstone Region for each considered species (elk, deer, antelope, bighorn sheep, moose, and black bear) was summed. Using these totals requires three assumptions:

- The totals include the double counting that occurs when one hunter hunts more than one species or in more than one area. The assumption must be made that the proportion of double reporting for hunters utilizing the Greater Yellowstone Region is the same as for the states as a whole.

- The states' data spans three years: 2004 in Wyoming, and 2002 and 2003 in Montana. In order to use these totals, the assumption was made that Montana's 2002 and 2003 is an accurate estimate of the 2004 harvest in that state and can be added to Wyoming's 2004 estimate to obtain a 2004 estimate of big game hunters for both states.
- As earlier indicated, not all wildlife considered a big game species were included in the analysis. In order to use the estimated total, it must be assumed that those species not included are negligible.

Calculated Uses and Economic Benefits in the Greater Yellowstone Region

Table 1 - Big Game Hunters

Source: Wyoming Game and Fish and Montana Fish, Wildlife, and Parks

		Wyoming - 2004 Population = 506,529				**Montana - 2004 Population = 926,865**			
		Teton and Park Counties 2004 Population = 45,480 = 9.0% of State Square Miles = 10,950 = 11.2% of State				**Madison, Gallatin, Park, & Carbon Counties 2004 population = 108,262 = 11.7% of State Square Miles = 11,043 = 7.6%**			
Species	**Type of Hunter**	**Year**	**# Hunting License Holders for Species**	**# License Holders Hunting in Yellowstone Region**	**Calculated % of License Holders Hunting in Yellowstone Region**	**Year**	**# Hunting License Holders for Species**	**# License Holders Hunting in Yellowstone Region**	**Calculated % of License Holders Hunting in Yellowstone Region**
Elk	Resident	**2004**	42,140	8,732	20.7%	**2002**	97,895	23,847	24.4%
	Non Resident		10,106	3,318	32.8%		17,149	6,315	36.8%
Mule Deer	Resident	**2004**	37,085	4,865	13.1%				
	Non Resident		26,015	2,259	8.7%				
White Tail Deer	Resident	**2004**	14,253	1,224	8.6%				
	Non Resident		7,528	235	3.1%				
Deer	Resident					**2003**	128,292	23,314	18.2%
	Non Resident						24,963	3,599	14.4%
Antelope	Resident	**2004**	17,063	152	0.9%	**2003**	29,528	1,438	4.9%
	Non Resident		20,701	39	0.2%		3,848	116	3.0%
Moose	Resident	**2004**	753	131	17.4%	**2003**	625	133	21.3%
	Non Resident		142	40	28.5%		25	8	31.2%
Big Horn Sheep	Resident	**2004**	171	110	64.1%	**2003**	237	39	16.6%
	Non Resident		60	36	60.8%		25	13	52.0%
Black Bear	Resident	**2004**	1,132	266	23.5%	**2002**	9,848	936	9.5%
	Non Resident		103	91	88.8%		915	20	2.2%
Total Licenses	Resident	**2004**	112,597	15,480	**13.7%**	**2004**	266,425	49,707	**18.7%**
	Non Resident		64,655	6,019	**9.3%**		46,925	10,070	**21.5%**

Source: US Fish and Wildlife Service 2001 National Survey of Fishing, Hunting, and Wildlife Recreation

Category	**Type of Hunter**	**Year**	**# Hunters in State**	**Calculated # Hunters Hunting in Yellowstone Region**	**Calculated % Hunters Hunting in Yellowstone Region**	**Year**	**# Hunters in State**	**Calculated # Hunters Hunting in Yellowstone Region**	**Calculated % Hunters Hunting in Yellowstone Region**
Big Game Hunters	Resident	**2001**	60,000	8,220	**13.7%**	**2001**	157,000	29,359	**18.7%**
	Non Resident		50,000	4,650	**9.3%**		48,000	10,320	**21.5%**
	All		110,000	12,870	**11.7%**		205,000	39,679	**19.5%**
All Hunters	Resident	**2001**	65,000	8,905	**13.7%**	**2001**	170,000	31,790	**18.7%**
	Non Resident		68,000	6,324	**9.3%**		59,000	12,685	**21.5%**
	All		133,000	15,229	**11.4%**		229,000	44,475	**19.4%**

Calculated numbers appear in BLUE

Table 2A - Big Game Hunting Trip and Equipment Expenditures

Source: US Fish and Wildlife Service
2001 National Survey of Fishing, Hunting, and Wildlife Recreation

Information	Residency	Wyoming	Wyoming Greater Yellowstone Region Calculated	Montana	Montana Greater Yellowstone Region Calculated
All Hunters					
	Resident	65,000	**8,905**	170,000	**31,790**
	Non Resident	68,000	**6,324**	59,000	**12,685**
	All	133,000	**15,229**	229,000	**44,475**
2001 Trip and Related Equipment Expenditures - All Hunters					
Total	Resident	$48,431,000	**$11,330,376**	$141,968,000	**$37,225,575**
Average/hunter - reported	Resident	$744	$744	$837	$837
Total	**Non** Resident	$57,945,000	**$5,002,284**	$63,771,000	**$13,433,415**
Average/hunter - reported	**Non** Resident	$791	$791	$1,059	$1,059
Total	All	$106,376,000	**$16,332,660**	$205,739,000	**$50,658,990**
Big Game Hunters					
	Resident	60,000	**8,220**	157,000	**29,359**
	Non Resident	50,000	**4,650**	48,000	**10,320**
	All	110,000	**12,870**	205,000	**39,679**
2001 Trip and Related Equipment Expenditures – Big Game Hunters					
Total	All	$78,859,000	**$12,107,780**	$163,607,000	**$40,284,853**
% of All Hunters	All	79.5%	79.5%	74.1%	74.1%

Calculated numbers appear in BLUE

Table 2B - Big Game Hunting Trip Expenditures

Source: US Fish and Wildlife Service
2001 National Survey of Fishing, Hunting, and Wildlife Recreation

Information	Residency	Wyoming	Wyoming Greater Yellowstone Region Calculated	Montana	Montana Greater Yellowstone Region Calculated
All Hunters					
	Resident	65,000	**8,905**	170,000	**31,790**
	Non Resident	68,000	**6,324**	59,000	**12,685**
	All	133,000	**15,229**	229,000	**44,475**
2001 Trip and Related Equipment Expenditures - All Hunters					
Total	Resident	$20,825,000	**$4,879,137**	$48,835,000	**$12,776,098**
Average/hunter - reported	Resident	$320	$320	$287	$287
Total	**Non** Resident	$50,073,000	**$4,656,789**	$58,237,000	**$12,520,955**
Average/hunter - reported	**Non** Resident	$736	$736	$987	$987
Total	All	$78,898,000	**$9,535,926**	$107,072,000	**$25,297,053**
Big Game Hunters					
	Resident	60,000	**8,220**	157,000	**29,359**
	Non Resident	50,000	**4,650**	48,000	**10,320**
	All	110,000	**12,870**	205,000	**39,679**
2001 Trip Expenditures – Big Game Hunters					
Total	All	$58,173,000	**$5,216,576**	$89,964,000	**$21,255,081**
% of All Hunters	All	54.7%	54.7%	84.0%	84.0%

Calculated numbers appear in BLUE

Table 3 - Big Game Hunting and Harvest

Wyoming – Data Source – Wyoming Game and Fish
Teton and Park Counties

Species	Year	Type of Hunter	% of Available Hunt Area	Number Harvested	% of State Harvest	Number License Holders	% of License Holders
Elk	2004	Resident	9.5%	2,844	**17.3%**	8,732	**20.7%**
		Non Resident	9.5%	1,480	**30.5%**	3,318	**32.8%**
Mule Deer	2004	Resident	7.5%	1,585	**8.2%**	4,865	**13.1%**
		Non Resident	7.5%	951	**5.5%**	2,259	**8.7%**
White Tail Deer	2004	Resident	7.5%	329	**4.9%**	1,224	**8.6%**
		Non Resident	7.5%	37	**0.9%**	235	**3.1%**
Antelope	2004	Resident	4.0%	124	**0.8%**	152	**0.9%**
		Non Resident	4.0%	39	**0.2%**	39	**0.2%**
Moose	2004	Resident	14.7%	120	**19.3%**	131	**17.4%**
		Non Resident	14.7%	25	**17.0%**	40	**28.5%**
Big Horn Sheep	2004	Resident	33.6%	101	**67.2%**	110	**64.1%**
		Non Resident	33.6%	32	**59.5%**	36	**60.8%**
Black Bear	2004	Resident	18.6%	68	**28.0%**	266	**23.5%**
		Non Resident	18.6%	27	**51.6%**	91	**88.8%**
Big Game - All	2004	Resident	10.4%	5,171	**8.7%**	15,480	**13.7%**
		Non Resident	10.4%	2,591	**5.5%**	6,019	**9.3%**

Montana - Data Source – Montana Fish, Wildlife, and Parks
Madison, Gallatin, Park, & Carbon Counties

Species	Year	Type of Hunter	% of Available Hunt Area	Number Harvested	% of State Harvest	Number License Holders	% of License Holders
Elk	2002	Resident	8.7%	4,980	**27.1%**	23,847	**24.4%**
		Non Resident	8.7%	1,358	**33.6%**	6,315	**36.8%**
Deer	2003	Resident	8.7%	17,007	**15.9%**	23,314	**18.2%**
		Non Resident	8.7%	1,561	**7.9%**	3,599	**14.4%**
Antelope	2003	Resident	7.5%	738	**2.8%**	1,438	**4.9%**
		Non Resident	7.5%	92	**2.3%**	116	**3.0%**
Moose	2003	Resident	16.6%	90	**17.8%**	133	**21.3%**
		Non Resident	16.6%	4	**21.1%**	8	**31.2%**
Big Horn Sheep	2003	Resident	18.4%	3	**2.2%**	39	**16.6%**
		Non Resident	18.4%	3	**23.1%**	13	**52.0%**
Black Bear	2002	Resident	17.8%	61	**6.1%**	936	**9.5%**
		Non Resident	17.8%	2	**1.0%**	20	**2.2%**
Big Game - All	2003-04	Resident	8.6%	22,879	**14.9%**	49,707	**18.7%**
		Non Resident	8.6%	3,020	**10.8%**	10,071	**21.6%**

BOLD numbers indicate that the % is greater than% of total available hunt area
RED numbers indicate that the % is less than the % of total available hunt area

References Used in Analysis of Consumptive Uses of Wildlife

1. Duda, M.D., P.E. DeMichele, M. Jones, C. Zurawski, A. Allen, C. Craun, A. Criscione, W. Testerman, J. Marshall, A. Lanier, S.J. Biossell, Pl Wang, and J. B. Herrick. 2004. Wyoming resident and nonresident deer, elk, and antelope hunter expenditure survey. Responsive Management, Harrisonburg, VA.
2. Brooks, R. 1993. Montana Bioeconomics Study-- A contingent valuation assessment of black bear hunting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.
3. Brooks, R. 1996. Montana Bioeconomics Study-- A contingent valuation assessment of moose, bighorn sheep and mountain goat hunting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.
4. Montana Department Fish, Wildlife and Parks. 2005. Areas for 2005/2006 deer/elk/antelope/bear/moose hunting districts. Unpublished data, Montana Dept. Fish, Wildlife and Parks. Helena, MT.
5. Montana Department Fish, Wildlife and Parks. 2004. Pronghorn Antelope Hunting and Harvest Report, License Year 2003. Montana Dept. Fish, Wildlife and Parks. Helena, MT.
6. Montana Department Fish, Wildlife and Parks. 2003. Black Bear Hunting and Harvest Report, License Year 2002. Montana Dept. Fish, Wildlife and Parks. Helena, MT.
7. Montana Department Fish, Wildlife and Parks. 2004. Deer Hunting and Harvest Report, License Year 2003. Montana Dept. Fish, Wildlife and Parks. Helena, MT.
8. Montana Department Fish, Wildlife and Parks. 2004. Elk Hunting and Harvest Report, License Year 2003. Montana Dept. Fish, Wildlife and Parks. Helena, MT.
9. Montana Department Fish, Wildlife and Parks. 2004. Special Big Game Hunting and Harvest Report, License Year 2003. Montana Dept. Fish, Wildlife and Parks. Helena, MT.
10. U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Montana. 46pp.
11. U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Wyoming. 46pp.
12. Wyoming Game and Fish Department. 2005. Annual Report of Big & Trophy Game Harvest 2004. Wyoming Game and Fish Department, Cheyenne, Wyoming.
13. Wyoming Game and Fish Department. 2005. Hunt Area size in Wyoming 2005. Unpublished data. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Non Consumptive Uses of Wildlife

Data for an analysis of non consumptive wildlife uses and their associated economic benefits in the Greater Yellowstone Region of Montana and Wyoming was conducted on the basis of the tourism and travel industry statistics provided by the University of Montana's Institute of Tourism and Recreation Research, Wyoming State Office of Travel and Tourism, Wyoming Business Council, and the US Fish and Wildlife Service's 2001 National Survey of Fishing, Hunting, and Wildlife Associated Recreation. The data in these reports constrained the analysis in several ways:

- Travel and tourism research in Montana has been almost exclusively focused on nonresident visitors. Reports do not distinguish between domestic and international visitors. In contrast, Wyoming focuses on all travelers, including state residents, as well as domestic and international travelers. Data from the US Fish and Wildlife Service's survey focuses on US residents and included information on both in-state and out-of-state travel for wildlife watching.
- Information contained in this section of the report was insufficient to calculate estimate variances or provide confidence intervals for the results. This report uses the word ***calculated*** to distinguish results from statistically valid estimates with corresponding measures of variance and confidence intervals.

Highlights of Results

The analysis resulted in the following calculated values:

1. **34.6%** of travelers' expenditures in Wyoming occur in Park and Teton Counties.
2. **21.7%** of nonresident expenditures in Montana occur in Carbon, Gallatin, Madison, and Park. Counties.
3. **8.6%** of travelers' expenditures in Wyoming can be attributed to wildlife watching.
4. **8.9%** of nonresident expenditures in Montana can be attributed to wildlife watching.
5. Domestic nonresident travelers spent **$44,706,648** in the Wyoming's Park and Teton Counties in 2004.
6. Domestic nonresident travelers spent **$37,814,442** in the Montana's Carbon, Gallatin, Madison, and Park. Counties in 2004.

Calculating Non Consumptive Uses and Economic Benefits in the Greater Yellowstone Region

State Collected Information

The University of Montana's Institute for Tourism and Recreation Research and the Wyoming State Office of Travel and Tourism's Wyoming's Business Council routinely survey travelers in their states. Both states collect information on amount and location of expenditures made by travelers (*references 1, 2, 3, 4, 5, and 6*).

- Montana focuses on "non resident visitors" and screens out Montana residents traveling in state. Montana does not distinguish domestic from international visitors. Hence, Montana's

reported expenditures include those from both domestic and international visitors. Montana reports expenditures to the county level for some counties in some years.

- Wyoming focuses on all travelers, including Wyoming residents and domestic and international non resident visitors. Hence, Wyoming's reported expenditures include those from Wyoming residents as well as both domestic and international travelers. Annual reports present some information at the county level, while the 1997 – 2004 summary report (*references 2*) presents detailed information at the county level.

US Fish and Wildlife Service Collected Information

The US Fish and Wildlife Service periodically conducts national surveys of fish, hunting, and wildlife associated recreation. The latest version of the survey was conducted in the year 2001 (*references 7 and 8*). The survey collects information on the amount and location of expenditures made by US residents during *primary purpose* wildlife watching trips. A *primary purpose* wildlife watching trip in one in which the traveler's primary motive for making the trip was to watch, photograph, or feed wildlife. Reports distinguish between state residents and domestic nonresidents.

Combining State and US Fish and Wildlife Service Information

In order to determine the expenditures occurring in the Greater Yellowstone Region that can be attributable to non consumptive wildlife uses, the information from the federal US Fish and Wildlife Service survey must be combined with information on county level expenditures from the states. Several issues arise in combining the three data sources:

- Differences in reporting with respect to residency must be accommodated. In order to utilize the US Fish and Wildlife Service's information on wildlife watching trips, expenditure information from the states must reflect the same definition of nonresidents – residents from other US states.
- Data on residency and county level expenditures are not available for every year, and were not available for the year in which the federal survey was conducted, 2001. The assumption was made that the there were no yearly differences with respect to:
    1. The proportion of total expenditures made by state residents, domestic residents, and international residents;
    2. The proportion of total expenditures occurring within each county within each state; and
    3. The proportion of total expenditures attributable to wildlife watching.
- None of the sources of data provided sufficient information to consider resident wildlife watching expenditure within the Great Yellowstone Region. The US Fish and Wildlife Service information provides an estimate of expenditures by state residents, but does not break down the state total by county. Montana's surveys do not consider state residents at all. Wyoming does include state residents in their surveys and reports the percent of expenditures on a statewide level that can be attributed to residents, domestic travelers, and international travelers.

Tables 4 and 5 summarize the steps and calculations made to estimate 2004 expenditures attributable to wildlife watching in the Great Yellowstone Region of both Wyoming and Montana.

Table 4 - Calculating Wyoming 2004 Non Consumptive Wildlife Use Expenditures in Greater Yellowstone Region

Geographic Basis	Year	Description of Data	Data	Data # = Formula	Source
Step 1 – Calculate 2001 traveler expenditures for state residents and non residents from other US states					
State	2001	Total Travel Spending - State Residents, Residents from Other US States, and International	$1,763,000,000	1	2
State	2004	% of Travelers from Other US States	75.0%	2	2
State	2001	Estimated spending - Travelers from Other US States	$1,322,250,000	**3**=1*2	Calculated
State	2004	% of State Resident Travelers	21.0%	4	2
State	2001	Estimated Travel Spending by State Residents	$370,230,000	**5**=1*3	Calculated
Step 2 – Calculate 2001 traveler expenditures that occurred in Greater Yellowstone Counties					
Park County	2001	Total Travel Spending - State Residents, Travelers from Other US States, and International	$186,500,000	6	2
Park County	2001	% Total Travel Spending - State Residents, Travelers from Other US States, and International	10.6%	**7=**6/1	Calculated
Teton County	2001	Total Travel Spending - State Residents, Travelers from Other US States, and International	$424,000,000	8	2
Teton County	2001	% Total Travel Spending - State Residents, Travelers from Other US States, and International	24.0%	**9=**8/1	Calculated
Greater Yellowstone Counties	2001	Total Travel Spending - State Residents, Travelers from Other US States, and International	$610,500,000	**10**=**7**+**9**	Calculated
Greater Yellowstone Counties	2001	% Total Travel Spending - State Residents, Travelers from Other US States, and International	34.6%	**11**=**10**/1	Calculated
Step 3 – Calculate % of 2001 traveler expenditures that can be attributed to wildlife watching					
State	2001	Wildlife Watching Trip Expenditures - State Residents	$22,217,000	12	8
State	2001	% of Travel Expenditures Related to Wildlife Watching - State Residents	6.0%	**13**=12/**5**	Calculated
State	2001	Wildlife Watching Trip Expenditures – Travelers from Other US States	$113,408,000	14	8
State	2001	% of Travel Expenditures Related to Wildlife Watching - Travelers from Other US States	8.6%	**15**=**14**/3	Calculated
State	2001	Wildlife Watching Trip Expenditures - State Residents and Residents from Other US States	$135,626,000	16	8
State	2001	% of Travel Expenditures Related to Wildlife Watching – State Residents and Travelers from Other US States	7.7%	**17**=**16**/1	Calculated
Step 4 – Calculate Wyoming's 2004 expenditures that occur in the Greater Yellowstone Counties by travelers from other US states that can be attributed to wildlife watching					
State	2004	Total Travel Spending - State Residents, Residents from Other US States, and International	$2,007,000,000	18	8
Greater Yellowstone Counties	2004	Calculated Expenditures from Residents from Other US States Attributable to Wildlife Watching in Great Yellowstone Counties of Wyoming	**$44,706,648**	**19** = 18*__15__*__11__*2	Calculated

Calculated numbers appear in BLUE

Table 5 - Calculating Montana 2004 Non Consumptive Wildlife Use Expenditures in Greater Yellowstone Region

Geographic Basis	Year	Description of Data	Data	Data # = Formula	Source
Step 1 – Calculate % of Montana's nonresident visitor expenditures occur in the Greater Yellowstone Counties					
State	2002	Total Nonresident Expenditures	$1,800,000,000	1	6
Carbon	2002	Nonresident Expenditures	$35,599,000	2	3
Carbon	2002	Estimated % of State Nonresident Expenditures	2.0%	**3=**2/1	Calculated
Gallatin	2002	Nonresident Expenditures	$239,279,000	4	4
Gallatin	2002	Estimated % of State Nonresident Expenditures	13.3%	**5=4**/1	Calculated
Park	2002	Nonresident Expenditures	$104,553,000	6	5
Park	2002	Estimated % of State Nonresident Expenditures	5.8%	**7=**6/1	Calculated
Madison	1998	% Spending in County Based on Survey Data	0.6%	8	1
Great Yellowstone Counties	2002	Estimated % of state non resident expenditures	21.7%	**9=3+5+7**+8	Calculated
Step 2 – Calculate % of Montana's nonresident visitor expenditures that can be attributed to wildlife watching					
State	2001	Nonresident Expenditures	$1,719,000,000	10	6
State	2001	Wildlife Watching Trip Expenditures – Travelers from Other US States	$153,134,000	11	7
State	2001	% of Nonresident Trip Expenditures Attributable to Travelers from Other US States on Wildlife Watching Trips	8.9%	**12=**11/10	Calculated
Step 3 – Calculate Montana's 2004 expenditures that occur in the Greater Yellowstone Counties by travelers from other US states that can be attributed to wildlife watching					
State	2004	Nonresident Expenditures	$1,958,000,000	13	6
Greater Yellowstone Counties	2001-2002	Estimated % of State Nonresident Expenditures Attributable to Wildlife Watching in Great Yellowstone Counties	1.9%	**14=12*9**	Calculated
Greater Yellowstone Counties	**2004**	**Estimated non resident expenditures attributable to wildlife watching in Great Yellowstone Counties - E30 X E 29**	**$37,814,442**	**15=14***13	Calculated
Calculated numbers appear in BLUE					

References Used in Analysis of Non Consumptive Uses of Wildlife

1. Cheek, Kristen A. 1998. Visitors to Montana Counties: A Pilot Analysis for Madison and Lincoln Counties. University of Montana Institute for Tourism and Recreation Research. www.itrr.umt.edu
2. Dean Runyan and Associates. 2005. The Economic Impact of Travel on Wyoming 1997 – 2004 Detailed State and County Estimates. State Office of Travel and Tourism, Wyoming Business Council.
3. University of Montana Institute for Tourism and Recreation Research. 2004 Niche News – Carbon County. www.itrr.umt.edu
4. University of Montana Institute for Tourism and Recreation Research. 2004 Niche News – Gallatin County. www.itrr.umt.edu
5. University of Montana Institute for Tourism and Recreation Research. 2004 Niche News – Park County. www.itrr.umt.edu
6. University of Montana Institute for Tourism and Recreation Research. 2005. 1994 - 2004 Montana Nonresident Expenditure Trends. www.itrr.umt.edu
7. U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Montana. 46pp.
8. U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Wyoming. 46pp.

Commercial Use of Wildlife and Wilderness Images

There is no question that the use of the internet is rapidly changing the way businesses market their products and consumers make their purchases. Consumers have come to expect businesses to host a web site to present product information; and businesses are increasingly turning to the internet to both service and attract customers. As the internet has become main stream part of business in all parts of the country, its pages offer us an opportunity to investigate the way in which businesses are present themselves. How do they "brand" their products or services? What words or phrases do they use to attract potential customers? In an effort to answer these questions, the author investigated the association of words denoting wildlife, wilderness, and their uses with the names of communities from across the states of Wyoming and Montana to determine those community names most closely linked to the wildlife and wilderness within the commercial or *.com* domain of the internet.

To test the hypothesis that the occurrence of branding words – words that cluster around a branding concept – associate more frequently on the internet pages of communities that are known for those brands, the author conducted the following experiment:

- Four cities that are nationally known for a specific "brand" were selected and compared to each other and eleven other nationally know cities with the hypothesis that the "branded" cities would have proportionally more commercial pages on the internet in which both the city name and the branding words occurred. The hypothesis is that the pages resulting from a Google search across the commercial or *.com* domain of the internet will produce the following:
    1. *Anchorage, Alaska* will occur proportionally more often with the words *wildlife* and *wilderness* than the other eleven cities;
    2. *Denver, Colorado* will occur proportionally more often with the words *skiing* and *ski* (without the word water occurring) than the other eleven cities;
    3. *Las Vegas, Nevada* will occur proportionally more often with the words *casino, gambling, gamming, poker,* and *roulette* than the other eleven cities; and
    4. *Orlando, Florida* will occur proportionally more often with the word *Disney* than the other eleven cities.
- Google searches were conducted in the following manner:
    1. Searches were conducted on 1/7/06 and 1/9/05. The internet is a very dynamic entity. The exact results from searches conducted at one time cannot be reproduced at a different time. Results from the two different search dates were statistically compared using a chi squared test. No significant differences were found between the searched on the dates.
    2. The search engine Google was used because of its ability to tailor the search in the following manner:
        - Searches were limited to the **.com** domain
        - Searches eliminated the word **travel**. Initial searches that included the word **travel**. Web pages from travel site often combine many different cities and their respective brands. For example, a travel service's web page might advertise Colorado skiing packages on the same page as Florida beach vacations and thus put Colorado on the same page with beaches and Florida on the same page with skiing.
        - Searches were for the **exact** words of each **city state**. This was to eliminate references to other cities with the same name in different states. An exception was made for New York, New York. The words **New York City** were used instead. Only pages with the
        - The range of searches covered **any page** in the requested domain.
        - Searches were for **any** of the "branding" words – that is, a page was listed if even one of the branding words was found.

- Multiple searches were conducted for each city. The proportion of the number of pages resulting from a search with the "branding" words to the number of pages resulting from a search without the branding word was calculated. A chi squared test was used to test for statistical differences. Results of the searches and statistically tests are given in Table 6.

Table 6 – Testing Use of Brands on Internet

City State	% with Branding Words **Wildlife Wilderness**	% with Branding Words **Skiing Ski** (without water)	% with Branding Words **Casino Gambling Gamming Poker Roulette**	% with Branding Words **Disney**
New York City	1.8%	1.3%	4.8%	5%
Anchorage Alaska	***4.5%**	3.0%	1.4%	1%
Los Angeles California	1.3%	1.1%	4.2%	4%
Miami Florida	1.4%	1.5%	5.5%	3%
Denver Colorado	2.7%	*3.9%	3.7%	2%
Salt Lake City Utah	2.0%	3.3%	8.2%	2%
Seattle Washington	1.9%	2.3%	13.7%	2%
Las Vegas Nevada	1.6%	1.7%	*49.1%	3%
Orlando Florida	2.3%	1.6%	4.9%	***17%**
Chicago Illinois	1.3%	1.5%	10.3%	2%
Minneapolis Minnesota	1.3%	1.0%	1.7%	1%
Atlanta Georgia	1.5%	0.9%	12.6%	2%
Dallas Texas	1.5%	1.9%	4.4%	2%
Kansas City Missouri	1.2%	2.4%	2.6%	6%
Honolulu Hawaii	1.2%	1.1%	1.9%	1%
* chi squared significant p<.001				

To apply this method of using internet searches to identify a community's business brand to the Wyoming and Montana, the same search techniques outlined above were applied to the names of communities in those states together with the branding words that denote wildlife or wilderness. The words included *wolf*, *wolves*, *grizzly*, *grizzlies*, *elk*, *deer*, *bear*, *wildlife*, *hunting*, *fishing*, and *wilderness.* Searches were conducted on 1/10/06. Table 7 presents the results in order of association between the branding words and the community name. Several gateway communities from other states were include for comparison. The Greater Yellowstone Regional communities from both states head the list of communities with names that are most closely associated with the wildlife and wilderness branding words.

Table 7 – Internet Association of Branding Words and Community Names

Branding Words
wolf, wolves, grizzly, grizzlies, elk, deer, bear, wildlife, hunting, fishing, wilderness

Wyoming Community	% with Branding Words	Montana Community	% with Branding Words
Jackson Wyoming	50.7%	West Yellowstone Montana	61.9%
Lander Wyoming	43.6%	Red Lodge Montana	52.5%
Sheridan Wyoming	40.3%	Livingston Montana	47.6%
Cody Wyoming	39.7%	Dillon Montana	41.1%
Powell Wyoming	35.1%	Hamilton Montana	40.0%
Rock Springs Wyoming	32.8%	Anaconda Montana	36.1%
Thermopolis Wyoming	32.6%	Whitefish Montana	34.9%
Evanston Wyoming	32.5%	Billings Montana	34.4%
Green River Wyoming	28.4%	Lewistown Montana	32.7%
Buffalo Wyoming	25.2%	Missoula Montana	31.9%
Laramie Wyoming	25.1%	Bozeman Montana	31.6%
Cheyenne Wyoming	24.2%	Helena Montana	29.6%
Gillette Wyoming	23.4%	Miles City Montana	28.7%
Casper Wyoming	21.6%	Butte Montana	28.4%
Riverton Wyoming	18.5%	Havre Montana	28.1%
Douglas Wyoming	10.9%	Great Falls Montana	27.6%
Kemmerer Wyoming	2.9%	Kalispell Montana	26.1%
Wheatland Wyoming	2.8%	Glasgow Montana	4.0%
Torrington Wyoming	2.6%	Laurel Montana	3.1%
		Belgrade Montana	3.0%
		Glendive Montana	2.8%
		Sidney Montana	2.8%

Communities in or near the Greater Yellowstone Region Communities in Red

Gateway Communities Outside of the Greater Yellowstone Region

Community	% with Branding Words	Community	% with Branding Words
Yucca Valley California	18.9%	Moab Utah	28.7%
Estes Park Colorado	36.1%	Bay Harbor Main	24.9%

Pertinent References (annotated as available from original electronic source)

Arosteguy, Daniel. Jean. 1974. Socio-economic based projections of wildlife recreation in Colorado to 1985. Ph.D. dissertation. Colorado State University. 479 pages. Publication Number: AAT 7427936.

Beeusaert, David Marcel. 1995. The non-consumptive values of wildlife in the Riding Mountain area. M.N.R.M. dissertation, Canada: The University of Manitoba. 147 pages. 1995. Publication Number: AAT MM99093. ProQuest document 743295251.

The primary purpose of this study is to determine the dollar value of non-consumptive recreation specifically related to the large mammal species of the Riding Mountain Biosphere Reserve (RMBR), which includes Riding Mountain National Park (RMNP) as its core area. The specific objectives are: to determine the level of non-consumptive expenditures by RMNP visitors: to determine the level of non-consumptive expenditures by permanent residents of the RMBR; to determine the level of non-consumptive expenditures by non-resident landowners of the RMBR; to determine the level of consumer surplus that exists in the RMBR for non-consumptive large mammal recreational use: and to offer recommendations concerning RMNP and RMBR management strategies.

The results of this project indicate that large mammals are an important resource in the RMBR and societal benefits are being derived from these animals. There are considerable non-consumptive expenditures by both area residents and Park visitors to enjoy these animals, as well as large levels of willingness-to-pay to further enjoy these animals.

Brooks, R. 1990. Montana Bioeconomics Study-- A contingent valuation assessment of lake and reservoir fishing: angler attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Brooks, R. 1991. Montana Bioeconomics Study-- A contingent valuation assessment of angler attitudes and economic benefits for selected waters statewide. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Brooks, R. 1993. Montana Bioeconomics Study-- A contingent valuation assessment of black bear hunting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Brooks, R. 1995. Montana Bioeconomics Study-- A contingent valuation assessment of mountain lion hunting.: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Brooks, R. 1996. Montana Bioeconomics Study-- A contingent valuation assessment of moose, bighorn sheep and mountain goat hunting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Cromley, Christina Maria. 2002. Beyond boundaries: Learning from bison management in Greater Yellowstone. Ph.D. dissertation. Yale University. 283 pages. Publication Number: AAT 3046142. ProQuest document 726403191.

Bison stir controversy by doing what made them a legend in American folk songs: roaming. Migrations over Park boundaries make for complicated decision-making. When bison enter state, federal, or private land surrounding the Park they wander unwittingly into overlapping jurisdictions of the U.S. Forest Service, state livestock departments, and state wildlife and game agencies. The presence of the disease brucellosis in bison also leave them subject to the scrutiny of the U.S. Animal and Plant Health Inspection Service (APHIS), which has worked decades to eradicate brucellosis from U.S. cattle herds.

Flaws in current policy result largely from fragmented structures of governance; conflicting values and myths; and the failure of scientific management to resolve problems that are fundamentally social and political. The numerous agencies involved operate with conflicting goals, laws, jurisdictions, and expectations: some follow mandates to protect livestock, others to protect wildlife. Conflicts over these mandates have led to at least twelve lawsuits between 1985 and 1998 over policies affecting bison management or brucellosis. Decisions also increasingly involve officials removed from the scene of action. Such fragmentation in decision making can exclude those directly affected

by decisions from working with agency officials and other participants. Fragmentation also complicates the task of managing resources in the common interest.

The outcome of bison management may tell us as much about the social and political reality of Western politics, Park management, and the ability of current structures of governance to meet the common interest as it does about bison, brucellosis, or cattle. The dissertation describes the history of the conflict, discusses openly the political nature of the decision-making process in bison management and assesses the process using common interest as a criteria for effectiveness. Common interest processes and decisions should be inclusive in their participation, should meet the valid expectations of participants, and should remain adaptable to achieve goals in a changing context when put to a practical test. The dissertation concludes with recommendations for improvements in the decision-making process.

Culver, Milton Lawrence, Jr. 1997. Resorting to tourism: The town and the valley of Jackson, Wyoming, through the 1950's. M.A. dissertation. Utah State University. 134 pages. 1997. Publication Number: AAT 1387759. ProQuest document 738229401.

Originally a ranching region, Jackson Hole, Wyoming, was devastated by the agricultural depression that followed World War I. Simultaneously, a political debate began over proposals to protect the Teton Range with national park designation. Compromises led to the creation of small Grand Teton National Park in 1929. Philanthropist John D. Rockefeller, Jr. commenced a land purchasing plan to enlarge Grand Teton, leading to the creation of Jackson Hole National Monument in 1943 and a larger Grand Teton National Park in 1950.

While park debates continued, residents attempted to find economic activities to replace ranching. They promoted tourism, but not without ambivalence. Tourism promotion met with some success during the 1930's. Travel boomed after World War II. This led to a startling transformation of the valley most evident in the town of Jackson. By the end of the 1950's, burgeoning tourist activity led to new problems, foreshadowing Jackson Hole's future.

Dalton, Robert S.; Bastian, Chris T.; Jacobs, James J.; Wesche, Thomas A. 1998. Estimating the economic value of improved trout fishing on Wyoming streams. North American Journal of Fisheries Management 18 (4): 786-797.

Abstract: Economic information that can be used to determine which management alternatives best meet public demands within limited budgets is important to resource management agencies. The objective of this study was to generate estimates of economic benefits of improvements on Wyoming trout fishing streams that could be used to evaluate different improvement projects. A mail survey was conducted to determine characteristics and preferences of anglers fishing Wyoming streams, and the contingent valuation method (CVM) was used to estimate economic benefits associated with fishing under improved conditions. Questions were associated with fishing for any or all trout species an angler might encounter on Wyoming streams. Benefits of improvement were based on CVM questions involving a hypothetical doubling of the chance of catching a large trout and a hypothetical increase in trout populations. Tourist and resident fishing license subgroups also were analyzed. Anglers in the tourist license group traveled long distances, spent more days fishing per trip, and had higher incomes than resident anglers. Consumer surplus estimates for the complete sample were USdollar sign101/d for increased trout populations and dollar sign132/d for doubling the chance of catching a large trout. Benefits for the resident angler for the large trout improvement and the population improvement were dollar sign87/d and dollar sign64/d, respectively. Tourist angler benefits were estimated at dollar sign227/d for the large trout improvement and dollar sign131/d for the population improvement. The results of this type of study can be used within a framework of net present value to evaluate and prioritize potential improvement projects.

DeRuiter, Darla Sue. 2002. Wildlife value orientations: Construct validity and a qualitative approach to measuring determinants. Ph.D. dissertation. 139 pages. Colorado State University. Publication Number: AAT 3053417. ProQuest document 726484061.

This dissertation reports the results from two related studies, one quantitative in nature and one qualitative. Both studies revolve around the values people hold toward wildlife. Chapter I introduces the concepts surrounding wildlife values, provides a literature review, theoretical and methodological background, and organizational information.

The first study, found in Chapter II, examines the construct validity of the wildlife value orientation scale. The predictive ability of a new, single-item measure was compared to the existing approach to measuring wildlife value orientations. A survey was administered which included both measures. After reliability of the scale was established, correlations, cluster analysis, and structural equation path models were conducted. Results show that the reliability of the existing scale is consistent with previous studies. The two measures were significantly correlated and had similar structure; however, the multi-item scale was more predictive of attitudes toward local wildlife issues than the single-item measure. While the new measure may prove to be sufficient to replace the existing scales, further research is required, as well as refining that measure. Validity of the wildlife value orientation construct can be tentatively confirmed.

The second study (Chapter III), takes an exploratory approach to understanding the determinants of value orientations toward wildlife. Four major dimensions (socialization, experience, personal characteristics, and place) were explored through in-depth interviews with 18 participants. Results suggest that these dimensions are an appropriate way to organize the determinants of wildlife value orientations, but that the combination and importance of the various dimension components fluctuated markedly for different people in the study. Family members, particularly fathers, were important influences common to nearly all respondents. Place of upbringing (rural or urban) played a key role in shaping wildlife value orientations, as did cohort. For some, direct experiences with wildlife were critical. Religiosity and gender were very important to a few participants, but articulation of these influences may be difficult because they are so imbedded in a person's psyche.

The manuscript concludes with Chapter IV, which discusses the theoretical, psychometric, and applied implications of the studies. By synthesizing the results from both chapters, a program of future research is presented.

Duda, M.D., V.L. Wise, W. Tresterman, A. Lanier, T.Noford, S.J. Bissell, and P. Wang. 2000.Wyoming 1998 Fishing trip expenditures. Responsive Management, Harrisonburg, VA.

Duda, M.D., P.E. DeMichele, S.J. Bissell, P. Wang, J. Herrick, A. Lanier, W. Testerman, J. Yoder, and C. Zurawski. 2001. Public Attitudes toward grizzly bear management in Wyoming. Responsive Management, Harrisonburg, VA.

Duda, M.D., P.E. DeMichele, C. Zurawski, M. Jones, J. Yoder, W. Testerman, A. Lanier, S.J. Bissell, P. Wang, and J.B. Herrick. 2003. Wyoming residents' attitudes toward and opinions on wolf mangement in Wyoming. Responsive Management, Harrisonburg, VA.

Duda, M.D., P.E. DeMichele, M. Jones, C. Zurawski, A. Allen, C. Craun, A. Criscione, W. Testerman, J. Marshall, A. Lanier, S.J. Biossell, Pl Wang, and J. B. Herrick. 2004. Wyoming resident and nonresident deer, elk, and antelope hunter expenditure survey. Responsive Management, Harrisonburg, VA.

Duffield, J., J. Loomis, and R. Brooks. 1987. The net economic value of fishing in Montana. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Duffield, J. 1988. The net economic value of elk hunting in Montana. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Duffield, J. and C. Neher. 1990. Montana Bioeconomics Study-- A contingent valuation assessment of Montana deer hunting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Duffield, J. and C. Neher. 1991. Montana Bioeconomics Study-- A contingent valuation assessment of Montana waterfowl h;unting: Hunter attitudes and economic benefits. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Eubanks, Larry Stanton. 1980. Essays on non-market valuation with applications to valuing wildlife resources. [Ph.D. dissertation. University of Wyoming; 1980. 137 pages. Publication Number: AAT 8111600. ProQuest document 751974821

This research develops a number of methods for valuing allocative changes in non-market commodities. In particular, a general analytical framework for valuing non-market commodities based on the household production model of the

consumer is developed. Three alternative estimation approaches which require differing assumptions and data requirements are outlined. Two of the estimation approaches are illustrated using 1975 data on Wyoming resident deer hunters. A survey approach is developed which is capable of gathering information useful in estimating market demand functions for hunting licenses which are contingent upon characteristics of the hunting experience. Market demand functions are estimated for Wyoming resident deer, elk, and antelope hunting licenses. In addition, option values and existence values for grizzly bear and bighorn sheep in Wyoming are estimated for a sample of Wyoming resident hunters. Information on option and existence values is gathered via a mail survey questionnaire.

Friedsam, Barbara L. 1999. Running Wild: Moab, Utah, and Jackson Hole, Wyoming. M.S. dissertation. University of Nevada, Reno. 139 pages. Publication Number: AAT 1398537. ProQuest document 732152871.

By the 20th century the National Park Service, the United States Forest Service (USFS), and the Bureau of Land Management (BLM), were shaping the American West with lasting imprints. Controversies remain today among each agency's agendas but an agency role in managing public lands remains influential and the impacts beyond debate. Two towns in the American West highlight similar processes yet divergent outcomes based on this land tenure. Moab, Utah, sits between two National Parks, Canyonlands and Arches, and much of the remaining property is managed by the BLM. Jackson Hole, Wyoming is situated south of Yellowstone and Grand Teton National Parks, and much of the remaining land is managed by the USFS. These two towns have collectively seen many land uses through time: ranching, agriculture, mining, stewardship, and currently tourism and recreational travel. Because of the current national popularity, the residents on the remaining limited private land are torn over meeting the needs of a local or larger visiting population. These towns' legacies are visible on the economy, community, environment, and landscape and are also responsible for Moab's and Jackson Hole's strong sense of place. At issue is evolving land use and the up to the moment conflicts that result from the current tourism interaction.

Fritts, Steven H.; Bangs, Edward E.; Fontaine, Joseph A.; Johnson, Mark R.; Phillips, Michael K.; Koch, Edward D.; Gunson, John R. 1997. Planning and implementing a reintroduction of wolves in Yellowstone National Park and Central Idaho. Restoration Ecology 5 (1): 7-27.

Abstract: The Northern Rocky Mountain Wolf Recovery plan proposed reintroduction of Canis lupus (gray wolf) to Yellowstone National Park and central Idaho as part of a wolf restoration plan for the northern Rocky Mountains of the United States. Strong opposition from some factions within the region forestalled the action for two decades. An environmental impact statement, conducted in 1992-1994 with extensive public input, culminated in a proposal to reintroduce wolves designated as "non-essential-experimental" under Section 10 (j) of the federal Endangered Species Act. This approach, approved by the Secretary of the Interior in 1994, provided for wolf restoration while allowing management flexibility to deal with concerns of the local public. A reintroduction plan was developed in the summer and fall of 1994. Acquiring, holding, transporting, and releasing suitable wolves for reintroduction presented a myriad of technical and logistical challenges that required effective planning and coordination by all participants. In January 1995, 29 wolves were captured in Alberta and transported to Yellowstone National Park (14) and central Idaho (15). Idaho wolves were freed immediately upon arrival; Yellowstone wolves (three family groups) were held in acclimation pens in the park until late March. Most Idaho wolves traveled extensively within the area intended for them, averaging 82 km net distance away from release sites after 5 months (range = 30-220 km), and three male-female pairs formed by July. After 5 months in the wild, at least 13 of 15 Idaho-released wolves were alive within the intended area, as were 13 of 14 Yellowstone wolves; one wolf was known to have been illegally killed in each area. No livestock were killed. Wolves released into Yellowstone Park continued to live as packs, stayed closer to their release sites (hivin x = 22 km at end of June), and settled into home ranges; two packs produced a total of nine pups. The progress of the reintroduction program in its first year far exceeded expectations. Reintroductions of about 15 wolves to each area for 2-4 more years are scheduled, but the project may be shortened because of early successes. Future reintroduction planners can expect sociocultural issues to pervade the effort, but they can be optimistic that, from a biological standpoint, reintroduction of wolves has strong potential as a restoration technique.

Greenquist, Connie Marie. 1983. The American pronghorn antelope in Wyoming: A history of human influences and management. Ph.D. dissertation, University of Oregon. 222 pages. Publication Number: AAT 8408170. Publication Number: AAT 8408170. ProQuest document 752123961

In Wyoming the American pronghorn antelope (Antilocapra americana) is the most numerous and the most conspicuous large mammal. Historically it was found there in the hundreds of thousands, perhaps in the millions. By the turn of the century the pronghorn was near extinction in the state. Today there are an estimated 400,000, more than half of the entire North American population.

In this study I examine the history of human influences on, and management of, the American pronghorn antelope in Wyoming. I discuss historical accounts of pronghorn numbers and distributions, the importance of pronghorn to American Indians, the methods Indians used to hunt pronghorn and the effects they had on pronghorn populations, the effects of white settlement in Wyoming, the subsequent market hunting of pronghorn, and the efforts of the Wyoming Game and Fish Commission to manage the pronghorn since 1869. I also discuss the introduction of livestock to pronghorn habitats, the development of livestock water sources; and the possible effects of programs of predator control, sagebrush control, and fire suppression on pronghorn populations.

In this study I attempt to account for the factors leading to the sharp population decline of Wyoming pronghorn during the last century, and to describe the subsequent events that allowed the pronghorn to increase in Wyoming to their present numbers. The decline can be attributed to white settlement and intense market hunting. The increase can be attributed to the timely protection given the pronghorn by the Wyoming Game and Fish Commission, the pronghorn's rapid reproductive rate, a reduction in livestock numbers and numerous livestock watering site developments. To compile this account I used published historical and scientific reports of pronghorn; unpublished records of the Wyoming Game and Fish Commission, the U.S. Fish and Wildlife Service, the Wyoming State Engineer's Office; and interviews of biologists and ranchers who work, or worked and still reside, in Wyoming.

Gresswell, Robert E.; Liss, William J. 1995. Values associated with management of Yellowstone Cutthroat trout in Yellowstone National Park. Conservation Biology 9 (1): 159-165 1995.

Abstract: Recent emphasis on a holistic view of natural systems and their management is associated with a growing appreciation of the role of human values in these systems. In the past, resource management has been perceived as a dichotomy between extraction (harvest) and nonconsumptive use, but this appears to be an oversimplified view of natural-cultural systems. The recreational fishery for Yellowstone cutthroat trout (Oncorhynchus clarki bouvieri) in Yellowstone National Park is an example of the effects of management on a natural-cultural system Although angler harvest has been drastically reduced or prohibited the recreational value of Yellowstone cutthroat trout estimated by angling factors (such as landing rate or size) ranks above that of all other sport species in Yellowstone National Park. To maintain an indigenous fishery resource of this quality with hatchery propagation is not economically or technically feasible. Nonconsumptive uses of the Yellowstone cutthroat trout including fish-watching and intangible values, such as existence demand, provide additional support for protection of wild Yellowstone cutthroat trout populations. A management strategy that reduces resource extraction has provided a means to sustain a quality recreational fishery while enhancing values associated with the protection of natural systems.

Gunther, Kerry A. , Haroldson, Mark A., Frey, Kevin, Cain, Steven L. , Copeland, Jeff, and Schwartz, Charles C. 2004. Grizzly bear-human conflicts in the Greater Yellowstone ecosystem, 1992-2000. Ursus 15 (1): 10-22.

Abstract: For many years, the primary strategy for managing grizzly bears (Ursus arctos) that came into conflict with humans in the Greater Yellowstone Ecosystem (GYE) was to capture and translocate the offending bears away from conflict sites. Translocation usually only temporarily alleviated the problems and most often did not result in long-term solutions. Wildlife managers needed to be able to predict the causes, types, locations, and trends of conflicts to more efficiently allocate resources for pro-active rather than reactive management actions. To address this need, we recorded all grizzly bear-human conflicts reported in the GYE during 1992-2000. We analyzed trends in conflicts over time (increasing or decreasing), geographic location on macro- (inside or outside of the designated Yellowstone Grizzly Bear Recovery Zone (YGBRZ)) and micro- (geographic location) scales, land ownership (public or private), and relationship to the seasonal availability of bear foods. We recorded 995 grizzly bear-human conflicts in the GYE. Fifty-three percent of the conflicts occurred outside and 47% inside the YGBRZ boundary. Fifty-nine percent of the conflicts occurred on public and 41% on private land. Incidents of bears damaging property and obtaining anthropogenic foods were inversely correlated to the abundance of naturally occurring bear foods. Livestock depredations occurred independent of the availability of bear foods. To further aid in prioritizing management strategies to reduce conflicts, we also analyzed conflicts in relation to subsequent human-caused grizzly bear

mortality. There were 74 human-caused grizzly bear mortalities during the study, primarily from killing bears in defense of life and property (43%) and management removal of bears involved in bear-human conflicts (28%). Other sources of human-caused mortality included illegal kills, electrocution by downed power-lines, mistaken identification by American black bear (Ursus americanus) hunters, and vehicle strikes. This analysis will help provide wildlife managers the information necessary to develop strategies designed to prevent conflicts from occurring rather than reacting to conflicts after they occur.

Haggerty, Julia Hobson. 2004. A ranchland genealogy: Land, livestock and community in the Upper Yellowstone Valley, 1866—2004. Ph.D. dissertation. University of Colorado at Boulder. 320 pages. Publication number: AAT 3153832. ProQuest document 828411701.

Two dominant trends characterize the ranching enterprise in the Mountain West during the twentieth century: the long-term continuity of ranching practices, families, and cultural habits on the one hand, and the volatility of the powerful structures that shape ranching, including economics, the environment, and political and social dynamics, on the other. This study describes the history of livestock production in the Upper Yellowstone Valley of Park County, Montana, focusing on business practices, land tenure patterns, ranch work and the environment, and on ranchers' relationships with wildlife. I found that land ownership change and economic volatility have characterized the ranch landscape since the late nineteenth century. From the late nineteenth through the mid-twentieth centuries, continuity on the ranch landscapes of the Upper Yellowstone benefited from an interlocking constellation of cultural narratives and material and financial practices that enabled ranchers to react to and accommodate change. A focus on the potential for economic prosperity, frugality and self-sacrifice, and neighbor-to-neighbor cooperation helped to sustain roughly three generations of ranchers in the Upper Yellowstone Valley despite ongoing financial and material hardships and regular land ownership change. However, three factors converged in the second half of the twentieth century to undermine the systems that had previously operated to encourage continuity: the mechanization of ranch operations, the post-war recreation boom, and the expansion of a wildlife conservation imperative beyond the boundaries of Yellowstone National Park.

Hammond, Thomas H. 1979. Jurisdictional preferences and the choice of tasks: political adaption by two state wildlife departments. Ph.D. dissertation. University of California, Berkeley, 495 pages. Publication Number: AAT 8014718. ProQuest document 752367391

What kinds of problems do organizations choose to work on? Which do they avoid? Over what do they want to have jurisdiction?

How these task and jurisdictional preferences were formed in the Wyoming and California fish and game departments was examined. The roles that administrators, wildlife biologists, and game wardens played in forming particular preferences is described in the context of the constraints and opportunities presented by governors, legislators, interest groups, other agencies, and the public.

Three key variables affecting these preferences were involved. One was the character of the agencies' external environments, particularly the patterns of support and opposition to the agencies' policies. The second was the predisposition of each of the occupations and professions in the agencies. The third was the beliefs of agency personnel about how wildlife populations behaved and what the role of a fish and game agency should be.

How these three variables interact with each other to produce organizational preferences for tasks and jurisdictions is described. Consideration is given to how well these particular variables can describe the preferences of other organizations.

Huff, Dan E.; Varley, John D. 1999. Natural regulation in Yellowstone National Park's northern range. Ecological Applications 9 (1): 17-29.

Abstract: Although the debate over natural regulation as practiced in Yellowstone National Park has been underway since the initiation of the natural process management policy in 1969, controversy over the management of Yellowstone's northern range dates back to the beginning of the 20th century. The debate over natural regulation combines elements of scientific disagreement with contrasting social values. Some scientists and range managers

critical of natural regulation management have viewed the northern range as seriously eroded and overgrazed due to an overpopulation of elk. Data, and the interpretations thereof, have been published supporting this viewpoint. Other scientists have challenged this opinion with the results of longer term studies and disparate interpretations of data gathered by the critics. Contrasting social values range from support for the "hands-off" management policy for ungulates in Yellowstone National Park to limiting ungulate populations to prevent eminent deteriorat ion of the range. It is the opinion of the authors that extensive published data support the position that current elk populations and sympatric herbivores do not exceed the ecological carrying capacity of the northern range; therefore, the range is not overgrazed by ecological standards. The discourse over science-driven and value-driven opinion will, and should, continue: neither scientific thinking nor social values are immutable.

Hugh, Katherine Grace. 1989. A content analysis of communications to determine the American world view of wilderness and grizzly bears. 1989. Ph.D. dissertation. University of Minnesota. 195 pages. Publication Number: AAT 9002993. Proquest Document 744781821.

The research examined communications from seven source areas: (1) economic user publications, (2) environmental publications, (3) mainstream publications, (4) Congressional minutes and testimony, (5) National Park Service interpretive information from Yellowstone and Glacier National Parks, (6) National Park Service Management plans for Yellowstone and Glacier National Parks, and (7) folktales. The data was analyzed by the Minnesota Contextual Content Analysis Computer Program and a step-wise multiple regression calculated in order to (1) determine whether the cultural posture of American society with respect to wilderness and the grizzly bear is one of development and/or preservation, (2) analyze how widely disseminated in society is either or both of those ideologies, and (3) discover whether the National Park Service is delivering preservation messages to the American public in reference to development or preservation.

Conclusions. (1) There is a widespread development perspective in American society. (2) The cultural heritage found in American society is one of preservation. (3) The National Park Service is not delivering a strong preservation message.

Jacoby, Karl Haywood. 1997. The recreation of nature: A social and environmental history of American conservation, 1872-1919. Ph.D. dissertation. Yale University. 443 pages. Publication Number: AAT 9731050. ProQuest document 739853551.

This dissertation analyzes the impact of the conservation movement on rural whites and Indians, the communities most directly affected by the movement's rise in the late nineteenth century. Weaving together examples from three locales--the Adirondack mountains of northern New York, Yellowstone Park in northwestern Wyoming, and Grand Canyon National Park in Arizona--the narrative emphasizes the legal dimensions of conservation, especially the criminalization of hunting, foraging, and other environmental practices. Country people, this study reveals, frequently contested these changes, which they viewed as assaults on longstanding rural customs. The result was widespread poaching, arson, squatting, and timber stealing on conservation lands across the American countryside. This study reassesses the character of these crimes, using them to shed fresh light on the moral universe of non-elite rural folk and to recreate the complex matrix of beliefs concerning work, gender relations, tradition, and community that shaped these people's conceptions of the natural world.

The dissertation thus has two larger goals. First, it attempts to nudge the field of environmental history beyond a focus on such well-known thinkers as Henry David Thoreau, John Muir, and Gifford Pinchot and towards a consideration of Indians, poor whites, and other subaltern peoples. Second, it endeavors to place the history of the American West in a broader context by drawing parallels to the eastern United States as well as to Africa, Asia, and Europe, where, much as it did in the U.S., the conservation movement played a central role in state building and market forming.

John, Gareth Edward. 2003. Yellowstone and the 'national park idea': Tracing the contours of a landscape idea. Ph.D. dissertation. University of Kentucky. 393 pages. Publication Number: AAT 3117502. ProQuest document 765206481

Between 1869 and 1872, the Upper Valley of the Yellowstone River was explored by four expeditions and as a consequence the region was rapidly transformed from a 'terra incognita' into the world's first national park. The

newspaper reports that began to trickle into the eastern cities were sensational, giving accounts of fantastic scenery and natural curiosities, dangerous encounters with carnivorous wildlife or worse 'sagacious' Indians, and the difficulty experienced negotiating the hazardous terrain. One explorer told of his lonely and terrifying 37-day trek back to 'civilization' after becoming estranged from his party. Others were reluctant to tell of what they had experienced for fear of their reputations. Whereas the 1869 and 1870 parties comprised local citizens, public officials and military personnel, the 1871 surveys were organized on a national level and were joined by established scientists, topographers, artists and photographers. Hayden's federally funded survey was especially influential and the combination of explorers' accounts and William H. Jackson's photographs and artist Thomas Moran's watercolors proved instrumental in bringing about legislation to establish Yellowstone as a public 'pleasuring-ground'.

Drawing on approaches to landscape representation in art history and cultural- historical geography and combining Foucault's archaeological method with work in critical iconology, this dissertation traces the exploration and establishment of Yellowstone National Park by examining the discursive relations and socio-spatial practices through which it was understood and by which it became known. Yellowstone, I argue, was principally enframed as landscape, an epistemic way of seeing that suffused the accounts of the variously trained explorers as much as it did the visual images of the artists and photographers themselves. Thomas Moran's painting The Grand Cañon of the Yellowstone , though not directly influential in the legislative process, nevertheless visually embodied so many of the discursive elements essential to the founding of Yellowstone National Park and stands, therefore, as an impressive reminder of the power of landscape imagery, not merely as a reflection of a 'deeper' social and political reality but an active constituent in the socio-historical and socio-spatial imperial project of westward expansion and the ordering of western territory as an 'object' of economic and political value.

Kaushalendra, Arha. 1997. Wildlife conservation on western private lands: Improving conservation policies and incentives. Ph.D. Dissertation, University of California, Berkeley. 355 pages. Publication Number: AAT 9828584. ProQuest document: 737656621.

The challenge facing wildlife conservation in the western United States is to preserve increasingly threatened habitat on private lands. Habitat conditions on western private lands also influence wildlife diversity and populations on the adjoining public lands. Several approaches at federal and state levels have been tried to conserve wildlife habitat on private lands. This study evaluates the functioning and performance of one such approach, Private Lands Public Wildlife (PLPW) programs, administered in the seventeen western states. Private Lands Public Wildlife Programs are initiated by state wildlife management agencies for two objectives: (i) to maintain and enhance wildlife habitat on private lands and (ii) to maintain and enhance public access to private lands. Based on the comparative analysis of these PLPW programs, a set of analytical tools and procedures are developed to better facilitate their implementation. Wyoming, as a representative western state, was chosen to demonstrate the use of spatial analysis in determining statewide distribution of private lands providing seasonal habitat for elk (Cervus elaphus), mule deer (Odocoileus hemionus), white-tailed deer (Odocoileus virginianus), pronghorn antelope (Antelocapra americana), bighorn sheep (Ovis canadensis), and moose (Alces alces). A seasonal elk Habitat Suitability Index (HSI) model is developed to determine the occurrence of habitat on private lands with a high probability of being used by elk in a given season. In conclusion, a process is outlined on how to use these analytical tools and procedures to develop and implement an effective Private Lands Public Wildlife program.

Kerkvliet, Joe; Nowell, Clifford; Lowe, Scott. 2002. The economic value of the Greater Yellowstone's blue-ribbon fishery. North American Journal of Fisheries Management 22 (2): 418-424.

Abstract: The U.S. National Park Service must find a balance in an inherently conflicting mandate that calls for preserving and protecting ecological systems while providing for the public's enjoyment of natural resources through recreation. This conflict is especially intense in the case of fisheries management. Although most of the waters in Yellowstone National Park are managed as catch-and-release fisheries, some individuals still hold that fishing (like hunting) in the park is in fundamental conflict with the goal of preservation. An important element in the National Park Service's balancing act is the economic value of recreation activities. This paper uses the results of a 1993 survey of anglers at five blue-ribbon fishing sites in and near Yellowstone National Park to estimate the economic value that anglers attach to their fishing experiences. We estimate that fishermen place a value of between USdollar sign172 and dollar sign977 on a day of fishing. For Yellowstone National Park, these estimates translate into a total value of

between dollar sign67.5 and dollar sign385 million for angling within the park. These estimates can provide some guidance to managers in deciding between alternative uses of the Greater Yellowstone's freshwater resources.

Kohley, T. and T. Buchanan. 1990. Nonconsumptive wildlife use in Wyoming. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Lavigne, Jean Elizabeth. 2003. Constructing Yellowstone: Nature and environmental politics in the Rocky Mountain West. Ph.D. dissertation. University of Kentucky. 325 pages. Publication Number: AAT 3102024. ProQuest document 764819551.

Recent academic work on the subject of nature has encouraged a reexamination of the foundations of environmental politics. Nature is no longer taken for granted as a simple, clearly defined, external object, but is instead understood as a concept constructed through social discourse: society defines what nature is, whether it should be preserved, and if so, in what form. While the social construction of nature in general has been addressed, little work has thus far examined the politics of nature: how particular ideas about nature are actually used in the public sphere to construct and influence environmental policy. This dissertation addresses this research lacuna by analyzing the activities of a single environmental organization, the Greater Yellowstone Coalition, and the ways in which it strategically deploys a particular understanding of nature to further its political goals.

The empirical portion of the work is presented through three case studies, each a controversial environmental issue to which the Coalition devoted considerable organizational resources. The first explores the Coalition's opposition to a proposed high-altitude gold mine near Yellowstone National Park; the second addresses its attempt to construct and implement a new, ecosystem-level bison management program; and the third examines the organization's support for phasing out snowmobile use in the region's national parks (Yellowstone and Grand Teton). In each case, analysis proceeds along three dimensions, centered around (i) the strategies employed by the Coalition in the pursuit of its environmental goals, including legal interventions, legislative initiatives, grassroots organizing and media campaigns; (ii) the spatial scales (local, regional and national) at which those strategies were carried out; and (iii) the ways in which those strategies were underpinned by the Coalition's attempt to discursively construct and stabilize Yellowstone and other 'natural' objects in a manner which would appeal to the public and consequently garner support for the organization's position.

If we accept that nature is socially constructed, we must also ask: how, by whom, and for what political purposes? The main contribution of this work is to present an empirical study which begins to address these questions as they apply to environmental politics in the Yellowstone region.

Lemke, Thomas O. 2004. Origin, expansion, and status of mountain goats in Yellowstone National Park. Wildlife Society Bulletin 32 (2): 532-541.

Abstract: In the 1980s scientists determined that an introduced mountain goat (Oreamnos americanus) population caused negative impacts to subalpine plant communities in Olympic National Park (ONP). These findings resulted in a controversial and costly mountain goat reduction program from 1981-1989. Since 1990 introduced nonnative mountain goats from Montana have successfully colonized Yellowstone National Park (YNP) via the Absaroka and Gallatin mountain ranges. Using systematic aerial surveys from 1997-2001, I documented a breeding goat population inside or within 1 km of YNP that increased from 24 to 96 mountain goats observed (mean observed rate of increase (r)over bar> = 0.35). Because of increasing goat populations immediately adjacent to YNP, Montana Fish, Wildlife, and Parks (MFWP) established 2 new hunting districts and 44 mountain goats were harvested near YNP from 1996-2001. The mountain goat is a socially popular "charismatic" species with high watchable-wildlife values. However, within YNP they also are viewed with concern as an exotic species, potentially capable of exploiting fragile subalpine landscapes where, by policy, nonnative ungulates are not welcomed. Based on habitat availability and goat densities to the north, YNP potentially may support 200-300 mountain goats. Important ecological differences between YNP and ONP may reduce the likelihood of negative resource impacts of mountain goats in YNP. However, the speed at which mountain goat numbers and distribution are increasing warrants further habitat and population monitoring to better understand and predict the ecological effects of this new species. Future mountain goat management decisions in YNP should be based on documented impacts of goats on their habitat and other species in YNP and not what has occurred in ONP. Mountain goat management efforts in YNP should acknowledge MFWP's management objective of

maintaining viable goat populations in suitable habitats and recognize that goats from Montana will continue to be a source population for future dispersal into and colonization of YNP.

Loomis, J. and J. Cooper. 1988. The Net Economic value of antelope hunting in Montana. Montana Dept. of Fish, Wildlife and Parks, Helena, MT.

Loomis, J., J. Cooper and S. Allen.. 1988. The Montana Elk hunting experience: A contingent valuation assessment of economic benefit s to hunters. Dept. of Fish, Wildlife and Parks, Helena, MT.

Mincher, Bruce J. 2002. Harvest as a component of Greater Yellowstone Ecosystem grizzly bear management. Wildlife Society Bulletin 30 (4): 1287-1292.

Abstract: The United States Fish and Wildlife Service (USFWS) has begun a process that might delist the Greater Yellowstone Ecosystem (GYE) grizzly bear (Ursus arctos) population under the provisions of the Endangered Species Act. Idaho, Montana, and Wyoming are preparing management plans that include provisions for harvest as the bears continue to expand their range beyond the recovery zone. Given the history of this isolated population, the hunting of the GYE bears will be contentious. Human-induced mortality plays a key role in limiting the grizzly bear population. However, there is evidence that the effort to limit mortality, especially female mortality, over the last 15 years has resulted in a recovered population. Given continued protection, and barring unprecedented habitat degradation, demographic models indicate that this population will continue to expand. Such a population could support a carefully regulated harvest, which might benefit long-term grizzly bear conservation by shifting human-induced mortality to male bears, and by increasing public tolerance for increased range. This paper examines the status of the current population of the GYE grizzly bear and the possible effects of harvest mortality.

Montag, Jessica M. 2004. Mountain lions, wolves, and bears: Detangling the issues surrounding predator conservation in the West. Ph.D. dissertation. University of Montana. 257 pages. Publication Number: AAT 3136255. ProQuest document 766265571.

Possible inequity in the distribution of benefits and costs of predator conservation is thought to be a particularly important factor in generating social conflict over predator conservation at specific locales. Predator compensation programs are an attempt to move beyond merely a regulatory solution and represent an economic strategy that attempts to deal with economic costs associated with predator conservation. However, if one conceives of predator compensation programs as solely economic strategies, then one overlooks the potential for compensation programs as a tool for solving issues of equity and distribution of costs to a greater segment of society as well as a tool for building communication around predator conservation and management issues. A purpose for this dissertation was aimed at obtaining an understanding of the social debate underlying views towards predator compensation in order to find out what the conflict/debate is really about.

The results indicate that predator compensation is widely viewed as desirable by both livestock owners and the general public. Considered collectively, the results suggest that the widespread sentiment that compensation is desirable stems from underlying beliefs about the question of how society should distribute the costs associated with predation; thus, compensation is seen as a desirable management option because it is seen as spreading the costs of predator conservation more fairly in society. Among many of the livestock owners, compensation was valued as a means of distributing the costs of predation more fairly rather than as a solution to the problem of predation. However, the results also indicate that there are important issues, such as predator impacts on deer and elk populations; human safety concerns; simply not wanting predators around; and private property rights, which compensation does not address. There was widespread support for other management options, in particular lethal control methods such as giving livestock owners the right to kill problematic predators and hunting by the public. The results also suggest that even though livestock owners typically readily identify complaints about the implementation of compensation, such as the verification process, they are still open to communication and having a dialog consisting of predator management issues.

Montana Department Fish, Wildlife and Parks. 2005. Areas for 2005/2006 Deer/elk/lion hunting districts. Unpublished data, Montana Dept. Fish, Wildlife and Parks. Helena, MT.

Parkhurst, Gregory Malcolm. 2003. Economic incentives for endangered species protection. Ph.D. dissertation. 286 pages. University of Wyoming; 2003. Publication Number: AAT 3092507. Publication Number: AAT 3092507. ProQuest document 765896641.

Private lands have an important role in the success of the Endangered Species Act (ESA). The current approach to protecting species on private land has resulted in disincentives to the landowner, which have decreased the success of the ESA. The first essay defines and evaluates eight incentive mechanisms for protecting species on private land. The incentive mechanisms are compared and contrasted according to a distinct set of biological, landowner, and government criteria. The discussion indicates voluntary incentive mechanisms can be designed where landowners view habitat as an asset, and are willing participants in protecting habitat. The incentive mechanism best suited for conserving habitat in a given region depends on many factors. The second essay examines the use of a dual mechanism, tradable habitat preservation requirements (THPR) with a subsidy. The subsidy is a function of the configuration of the conserved land, ensuring that the biologically effective landscape design is conserved, while the THPR policy ensures that conservation is accomplished at least cost. We evaluate the dual mechanism in a general equilibrium utility maximization framework, in which conservation is modeled as an impure public good for which landowners have heterogeneous preferences. The third essay examines the effectiveness of a vector of agglomeration bonus mechanisms at creating targeted habitat configurations for protecting endangered species, and doing so voluntarily. A government agency's role is to target the critical habitat, to integrate the agglomeration bonus into the compensation package, and to provide landowners unconditional freedom to choose which acres to retire. The lab results indicate in many cases subjects coordinated their conservation activities to achieve the optimal habitat configuration. In the fourth essay bidding behavior in incentive compatible Vickrey-style auctions when people have both positive and negative induced values for the good is explored. In aggregate, bidding in the classic second- price auction is precise but biased. In contrast, observed bidding behavior in the random n th-price auction is demand revealing irrespective of induced value, but is imprecise.

Philpott, William Peter. 2002. Consuming Colorado: Landscapes, leisure, and the tourist. Ph.D. Dissertation. University of Wisconsin-Madison. 421 pages. Publication Number: AAT 3072863. ProQuest document 765052641

This dissertation takes up a crucial but not yet well-studied question in the field of environmental history: how has the twentieth-century experience of mass consumption influenced environmental attitudes? Studying the history of mass tourism, I suggest, is an especially promising way to tackle this question. After all, if we define tourism as the consumption of leisure in commercialized landscapes, we can then see the history of tourism as a key meeting ground between environmental history and the history of consumer culture.

One such meeting ground Is the Colorado high country: a mountainous area west of Denver, now bisected by Interstate 70. Here, tourist promoters, especially after 1945, turned nature, landscapes, and leisure into objects of consumer desire. They used advertising to reduce complex terrain to simple imagery, closely linked to notions of emotional fulfillment. And they "packaged" settings for convenient, large-scale recreational use--by converting older towns like Aspen; creating new ones like Vail; manipulating wildlife; and building such infrastructure as ski hills, ski tows, and highways, including Interstate 70 itself. In the end, these changes did indeed foster mass tourism in a land previously little visited. But in the process, the changes also fostered a "tourist way of life." Colorado began to lure hordes of new residents who wanted to live permanently in exactly the sorts of scenic, relaxing, recreation-friendly settings that promoters had packaged for tourists. In effect, these newcomers had learned to value landscapes for their leisure atmosphere, and to "shop" for them and "consume" them accordingly.

Replicated widely, not just in Colorado, the tourist way of life has brought major changes on a national scale since World War II, including the westward shift of people and political power, the explosion of suburbs and exurbs, the rise of popular environmentalism, and an ever-widening gap between enclaves of "permanent tourists" and enclaves of the service workers needed to support them. In the end, consumerism certainly has reshaped American environmental attitudes, but in return, our modern consumer lifestyles have come to depend fundamentally upon leisure-minded ways of viewing and using the environment around us.

Pritchard, James A. 1996. Preserving natural conditions: Science and the perception of nature in Yellowstone National Park. Ph.D. dissertation. University of Kansas; 1996. 510 pages. Publication Number: AAT 9634391. ProQuest document 743155931

This dissertation utilizes perspectives borrowed from environmental history and the sociology of science to analyze the influence of ecological ideas on management policies in Yellowstone National Park. Critics of the National Park Service (NPS) have suggested that faulty philosophical concepts of recent origin have resulted in destructive wildlife management practices. This study demonstrates that management policies allowing natural processes to continue without human intrusion originated in the 1910s and 1920s. During the formative years of the National Park Service, scientists of national stature influenced the direction of park management by constructing scientific purposes for Yellowstone. Scientists envisioned Yellowstone as a place where unmodified nature might be observed. Joseph Grinnell and Tracey Storer, ecologists at Berkeley, first spoke for this purpose of the parks in 1919. John C. Merriam of the Washington science establishment urged the preservation of "natural conditions" during the 1920s, legitimizing the parks as repositories of unmodified nature.

In 1929, George M. Wright established a scientific branch within the NPS, the Wildlife Division, which affirmed the scientific mission of establishing sanctuaries of unmodified nature. The Wildlife Division introduced a second management purpose, that of re-establishing a disrupted balance of nature through active intervention. Since that time, Yellowstone management biologists drew from twin traditions of management philosophy, one emphasizing the need to intervene in nature to establish balance, the other seeking to allow nature to carry on without human interference. Scientific rationales as well as cultural forces influenced how managers incorporated the twin traditions into management rationales. A controversy over pelicans during the 1930s, management of elk, bison and bears, the reintroduction of wolves, the fires of 1988, and interagency cooperation are used to demonstrate how managers incorporated the twin traditions and ecological ideas into management.

Since the creation of the National Park Service, scientists have continually used a vision of natural conditions as a guide for management, although science and policies have changed a great deal. Biologists used new ecological ideas to redefine strategies for achieving the National Park Service mission. This study describes how science, nature and culture interacted in Yellowstone National Park in complex ways.

Rasker, Raymond; Hackman, Arlin. 1996. Economic development and the conservation of large carnivores. Conservation Biology 10 (4): 991-1002.

Abstract: Conserving large carnivores in North America hinges on protecting vast wildlands, a strategy often assumed to carry significant economic costs in terms of jobs and income foregone. Using case studies, we tested whether there is enough evidence to support the assertion that the protection of wildlands is detrimental to economic development in the northern U.S. Rocky Mountains and the Rocky Mountains of southern British Columbia and Alberta. We analyzed employment and income trends in northwestern Montana (U.S.A.) for counties with a high degree of wildland protection versus counties with high levels of resource extraction and little wildland protection. Employment and personal income levels in "wilderness" counties grew faster than in "resource-extraction" counties. Wilderness counties also showed higher degrees of economic diversification and lower unemployment rates. No direct cause-and-effect relationship was established between wildlands protection and economic development, but to the assertion that protecting wildland habitat for large carnivores is detrimental to a region's economy, enough counterevidence is presented to suggest an alternative hypothesis: the protection of wilderness habitat that sustains wild carnivores such as grizzly bears (Ursus arctos horribilis) and wolves (Canis lupus) does not have a detrimental effect on local or regional economies. Evidence presented suggests that economic growth is stimulated by environmental amenities. Further, case studies in southern British Columbia and Alberta in Canada and the Greater Yellowstone region, in the U.S., where environmental protection has been explicitly recognized as an economic development strategy, suggest that environmental protection and economic development are complementary goals. In some areas, however, "amenity-based" economic growth is rapidly leading to urban sprawl and subsequent loss of wildlife habitat, and there is a need for growth management.

Ruth, Toni K. (truth@wcs.org); Smith, Douglas W.; Haroldson, Mark A.; Buotte, Polly C.; Schwartz, Charles C.; Quigley, Howard B.; Cherry, Steve; Murphy, Kerry M.; Tyers, Dan; Frey, Kevin. 2003. Large-carnivore response to

recreational big-game hunting along the Yellowstone National Park and Absaroka-Beartooth Wilderness boundary. Wildlife Society Bulletin 31 (4): 1150-1161.

Abstract: The Greater Yellowstone Ecosystem contains the rare combination of an intact guild of native large carnivores, their prey, and differing land management policies (National Park versus National Forest; no hunting versus hunting). Concurrent field studies on large carnivores allowed us to investigate activities of humans and carnivores on Yellowstone National Park's (YNP) northern boundary. Prior to and during the backcountry big-game hunting season, we monitored movements of grizzly bears (Ursus arctos), wolves (Canis lupus), and cougars (Puma concolor) on the northern boundary of YNP. Daily aerial telemetry locations (September 1999), augmented with weekly telemetry locations (August and October 1999), were obtained for 3 grizzly bears, 7 wolves in 2 groups of 1 pack, and 3 cougars in 1 family group. Grizzly bears were more likely located inside the YNP boundary during the pre-hunt period and north of the boundary once hunting began. The cougar family tended to be found outside YNP during the pre-hunt period and moved inside YNP when hunting began. Wolves did not significantly change their movement patterns during the pre-hunt and hunting periods. Qualitative information on elk (Cervus elaphus) indicated they moved into YNP once hunting started, suggesting that cougars followed living prey or responded to hunting activity, grizzly bears focused on dead prey (e.g., gut piles, crippled elk), and wolves may have taken advantage of both. Measures of association (Jacob's Index) were positive within carnivore species but inconclusive among species. Further collaborative research and the use of new technologies such as Global Positioning System (GPS) telemetry collars will advance our ability to understand these species, the carnivore community and its interactions, and human influences on carnivores.

Smith, Douglas W., and Peterson, Rolf O. and Houston, Douglas B. 2003. Yellowstone after wolves. Bioscience 53 (4): 330-340.

Abstract: With gray wolves restored to Yellowstone National Park, this ecosystem once again supports the full native array of large ungulates and their attendant large carnivores. We consider the possible ecological implications of wolf restoration in the context of another national park, Isle Royale, where wolves restored themselves a half-century ago. At Isle Royale, where resident mammals are relatively few, wolves completely eliminated coyotes and went on to influence moose population dynamics, which had implications for forest growth and composition. At Yellowstone, we predict that wolf restoration will have similar effects to a degree, reducing elk and coyote density. As at Isle Royale, Yellowstone plant communities will be affected, as will mesocarnivores, but to what degree is as yet undetermined. At Yellowstone, ecosystem response to the arrival of the wolf will take decades to unfold, and we argue that comprehensive ecological research and monitoring should be an essential long-term component of the management of Yellowstone National Park.

Schullery, Paul; Whittlesey, Lee. 2001. Mountain goats in the Greater Yellowstone Ecosystem: A prehistoric and historical context. Western North American Naturalist 61 (3): 289-307.

Abstract: Because the relatively recent colonization of portions of Yellowstone National Park by introduced mountain goats (Oreamnos americanus) from public game lands in Montana raises important policy and management questions for the park, it is necessary to understand the prehistoric and early historical record of mountain goats in the Greater Yellowstone Ecosystem. We reviewed previous paleontological, archeological, and historical studies of goat presence and examined a large body of historical material for evidence of goats. Native mountain goat range most closely approached the Greater Yellowstone Ecosystem to the west, but no modern authority claims goats were resident in the ecosystem in recent centuries. Historical accounts of goat presence in the region prior to 1882 (and thus prior to any known introduction of goats by Euro-Americans) are limited to one possible sighting by unreliable observers and a few casual mentions of goat presence by people of limited or unknown familiarity with the ecosystem. Other early observers in the region specifically stated that goats were not native. Between 1882 and 1926 other observers and residents agreed that mountain goats were not native to the park, or to the larger area around it. It is impossible to prove absolutely that there were no goats in the ecosystem prior to modern introductions, but historical evidence demonstrates that if present, such goats must have been exceedingly rare and uncharacteristically unsightable. National Park Service policy relating to exotic species developed gradually after the creation of Yellowstone National Park in 1872, moving from a general receptivity to introduction of at least some favored nonnative species to a general prohibition on all such introductions. Current policy, while disapproving of all nonnative species, seems to reserve special efforts at removal of nonnatives for those species that pose the greatest threat to native species and ecosystems.

Current policy is not helpful in defining the minimum amount of evidence needed to prove a species was present or absent, or whether or not an introduced nonnative species is causing sufficient harm to justify its removal.

Shafer, Craig L. 2000. The northern Yellowstone elk debate: Policy, hypothesis, and implications. Natural Areas Journal 20 (4): 342-359.

Abstract: Which management strategy, intervention or nonintervention, is best for the northern elk herd of Yellowstone National Park? This question was first raised in the early part of the twentieth century and resurfaced in the 1960s, prompting controversy that continues today. In response, Congress in 1997 requested that the National Academy of Sciences study the issue. This paper examines relevant National Park Service history and policy regarding this debate. Some of the primary factors scientists think have influenced elk abundance and distribution are profiled, and inherent semantic problems are examined. The 1969 natural regulation hypothesis, which has governed Yellowstone park policy since 1967, and its associated assumptions are defined. The interrelated technical issues that are key to the natural regulation hypothesis include migration and outside land conversion, historical elk population size, range expansion, baseline conditions, population stability, Native Americans, predation and fire, and sport hunting. This paper also revisits an obscure 1917 scientific hypothesis-that landscape alteration outside Yellowstone influences elk abundance inside the park-and restates it in broader, more modern terms: national park size influences the need for management intervention because of alteration of natural processes outside park boundaries. Some scientists perceive that intervention in the management of national park natural resources has decreased since 1872. Thus, this paper also asks whether the need for intervention is increasing as large spatial scale natural processes are progressively impeded outside the parks. Looking at the range of park natural units as a whole, a mixture of intervention and nonintervention may be the best approach.

Steinbach, Mark S. 2004. Evaluating the consequences of public land grazing permit buyout program, permit reductions, and increased fees on land ownership and open space in Western states. University of Montana. 251 pages. Publication Number: AAT 3150627. ProQuest document 813787221

Loss of private land open space in the form of ranches to subdivisions and "hobby ranches" are responsible for reducing habitat for wildlife species, introducing exotic species, and dramatic alteration in rural communities. Additionally, due to economic unfeasibility, many private ranches are being sold and consolidated into "corporate ranches" comprised of multiple small individual holdings. One of the most controversial topics concerning agriculture in the West is use of public lands for grazing. This study investigated the role that public land grazing plays in maintaining viable ranching operations and conserving private land open space in the Rocky Mountain region of the Western United States, which includes Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, and Arizona.

A key component of this study was understanding the effect of the proposed grazing permit buyout program, increased grazing permit prices, and reduction in numbers of permitted AUMs on private ranching operations. Grazing permits enhance the economic viability of ranching, therefore maintaining viable ranching operations prevents the conversion of rangeland to residential development. Thus, the grazing permit program produces benefits other than direct support of ranches. Loss of grazing permits could serve as a pivotal factor in expediting private land fragmentation, if ranching operations are enticed to sell their land due to loss of economic viability. The goal was to provide socio-demographic profiles for landowners to better understand social motivations for ranching, implications of permit removal, ongoing conservation activities, and possible policy solutions.

I randomly sampled 2000 ranchers from the current population of public land grazing permittees (approx 20,000) with a mail survey. The ensuing survey provided broad-scale data on attitudes and demographic information on landowners in addition to their interactions with other individuals concerning land development trends and reactions to proposed changes in grazing policies. Personal interviews were conducted to provide more insight to specific themes identified from the mail out survey and ground truth the data.

Stoll, John Raymond. 1980. The valuation of hunting related amenities: a conceptual and empirical approach. [Ph.D. dissertation. University of Kentucky. 183 pages. Publication Number: AAT 8110217. ProQuest document 751627271

A conceptual framework for the valuation of wildlife resource related amenities is presented in this dissertation. The "new theory of demand" developed by Lancaster and previous work of other researchers in household production theory are utilized in the development of this conceptual framework. Activity and existence values for resources are conceptualized. The end product is a framework which can be used in the collection of data, data analysis, and provision of information for wildlife resource management purposes. Hicksian measures of welfare change are also redefined within this framework and a unique notation is introduced for their representation. These measures can be used to determine the impact upon households of changes in wildlife populations. Total value and compensated demand curves for the wildlife resource are defined.

An empirical application is presented and used to estimate values for elk hunting related amenities in Wyoming. This application uses the iterative bidding form of contingent valuation techniques. In this case study mean household willingness to pay (WTP) annually for the right to hunt elk is estimated to range from $44.09 to $126.04 depending upon the elk/encounter package. Previous methods of estimating models using iterative bidding results are substantially improved in this study. Theoretically relevant variables are identified using the developed conceptual framework: (1) variables defining the specific consumption package, (2) variables isolating differences in household consumption technology, and (3) variables indicative of differing tastes and preferences. The final estimated model adopted for further use utilized income categorized data and included variables which allow for variation in household consumption technology. This model resulted in an estimate of an income elasticity of bid equal to .369 which, in this model specification, is also equal to the price flexibility of income for elk encounters. A new method for handling "poor" respondents to iterative bidding formats is also discussed.

The estimated model is used to determine a total value curve for the right to hunt elk. From this total value curve, a compensated demand curve for elk encounters is derived. The estimated annual marginal value of an additional elk encounter is $3.65 when the household typically encounters five elk. The estimated annual total value of the right to hunt elk is $95.98 when six elk are typically encountered.

Smaldone, Dave. 2002. An exploration of place attachment in the Jackson Hole Valley. Ph.D. Dissertation. University of Idaho. 157 pages. Publication Number: AAT 3076173. ProQuest document 765126451.

Numerous theoretical frameworks have been conceptualized in the search to understand how places become meaningful to people. These models suggest that person-place bonds are complex, multidimensional and involve numerous interrelated variables. This study assessed place attachment using quantitative and qualitative methods, including a mail-back survey distributed to Grand Teton National Park (GTNP) visitors, and in-depth personal interviews with visitors to the park and residents of Jackson Hole, WY. The theory, methodology, and results of this study are described in three articles that comprise this dissertation.

The first article assesses place attachment as a potential natural resource management tool by examining this concept in visitors to GTNP and its relation to ongoing "critical" issues in the park. Results indicate that GTNP is a place that holds a multitude of meanings for visitors, including emotional and social meanings. Visitors reporting a special place in GTNP were more likely to indicate an impact (either positive or negative) due to the critical issues. In relation to the reasons places were important, the negatively impacted group was more likely to describe emotional connections than the positive or neutrally affected groups. Management could potentially use place attachment as a variable to select stakeholders to participate in public involvement processes.

The second article focuses on how two key factors--length of association with the place, and place of residence in relation to the special place--affect the development of place attachment. Results indicate that both variables play important roles in connecting people to places. Every person-place bond is located within a temporal scale, and time is viewed as a necessary but not sufficient factor contributing to place attachment. Longer lengths of associations were related to more frequent reports of emotional and social connections to important places. The type of place was also important to consider when assessing place meanings.

The third article explores the theoretical framework of place attachment, and it uses interview data to address some of the processes of how place attachment forms. Important findings included re-conceptualizing place attachment as a dynamic relational process, whereby the relationship between person and place is always being recreated.

Teel, T.L., A.A. Dayer, M.J. Manfredo, and A. D. Bright. 2005. Regional results fr om the research project entitled "Wildlife Values in the West." (Project Rep. No. 58). Project Report for the Western Association of Fish and Wildlife Agencies. Fort Collins, CO: Colorado State University, Human Dimensions in Natural Resources Unit.

U.S. Fish and Wildlife Service. 1994. 1980-1990 Fishing, hunting, and wildlife-associated recreation trends. State and Regional Trends. Addendum to the 1991 National Survey of fishing, hunting, and wildlife-associated recreation Report 91-2. 17pp.

U.S. Fish and Wildlife Service. 1995. Participation and expenditure patterns of African-american, hispanic, and women hunters and anglers. . Addendum to the 1991 National Survey of fishing, hunting, and wildlife-associated recreation Report 91-3. 40pp.

U.S. Fish and Wildlife Service. 1998. 1996 Net economic values for bass, trout and walleye fishing, deer, elk and moose hunting, and wildlife watching. Addendum to the 1996 National Survey of fishing, hunting, and wildlife-associated recreation. Report 96-2. 36pp.

U.S. Fish and Wildlife Service. 1999. 1980-1995 Participation in Fishing, hunting, and wildlife watching. National and regional demographic trends. Report 96-5. 83pp.

U.S. Fish and Wildlife Service. 2000. Participation and expenditure patterns of African-american, hispanic, and women hunters and anglers. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 96-6. 28pp.

U.S. Fish and Wildlife Service. 2002. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. State overview Preliminary findings. 28pp.

U.S. Fish and Wildlife Service. 2002. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. National overview Preliminary findings. 19pp.

U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Montana. 46pp.

U.S. Fish and Wildlife Service. 2003. 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. Wyoming. 46pp.

U.S. Fish and Wildlife Service. 2003. Net economic values for wildlife-related recreation in 2001. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 2001-5, U 2001 National survey of Fishing, Hunting, and wildlife-associated recreation. State overview Preliminary findings. 28pp.

U.S. Fish and Wildlife Service. 2004. Fishing and hunting 1991-2001: Avid, casual, and intermediate participation trends. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 2001-5, U 2001 National survey of Fishing, Hunting, and wildlifej-associated recreation. State overview Preliminary findings. 28pp.

U.S. Fish and Wildlife Service. 2004. Participation and expenditure patterns of African-american, hispanic, and women hunters and anglers. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 2001-4. 40pp.

U.S. Fish and Wildlife Service. 2005. Economic impact of waterfowl hunting in the United States. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 2001-3. 13pp.

U.S. Fish and Wildlife Service. 2005. The relationasip between wildlife watchers, hunters, and anglers. Addendum to the 2001 National Survey of fishing, hunting, and wildlife-associated recreation. Report 2001-7. 40pp.

Ward, J.P. and S.H. Anderson. 1989. Nonconsumptive user survey and recommendation for activities in Wyoming. Wyoming Game and Fish Department. Cheyenne, Wyoming.

White, P. J., and R.A. Garrott. 2005. Yellowstone's ungulates after wolves - expectations, realizations, and predictions. Biological Conservation 125 (2): 141-152 .

Abstract: We evaluated the initial implications of wolf (Canis lupus) recovery on ungulates in Yellowstone National Park and compared expectations prior to wolf restoration with observed impacts since restoration. The numerical and functional responses of colonizing wolves in Yellowstone's prey-rich environment were higher than expected and close to the maximum rates predicted prior to wolf restoration. Counts of northern Yellowstone elk (Cervus elaphus) decreased more (50%) than predicted (5-30%), and will likely continue to decrease given the strong preference of wolves for elk and continued high kill rates despite this substantial reduction in elk abundance. Contrary to expectations, human harvests were not reduced appreciably concurrent with wolf restoration, but instead remained similar to pre-wolf restoration years. However, antler-less permits were gradually reduced by 51% during 2000-2004 and additional reductions may be necessary while wolf densities remain high. There have been no substantial effects of wolf recovery on other ungulate species (bighorn sheep (Ovis canadensis), bison (Bison bison), moose (A Ices alces), mule deer (Odocoileus hemionus), pronghorn (Anti-loeapra americana)). However, wolf recovery may eventually contribute to increased bison and pronghorn abundance by decreasing elk and coyote abundance, respectively. Wolf recovery may also contribute to more-pronounced spatial structuring of sex/age classes of northern Yellowstone elk through changes in their distribution, migration, and age structure. The initial consequences of wolf recovery support the premise that wolves may naturally achieve densities above their threshold for ecological effectiveness and contribute to significant changes in ecosystems, including the amelioration of ungulate-caused landscape simplification.

Wondrak, Alice Karen. 2002. (Do not) feed the bears: Policy, culture, and the historical narrative of the Yellowstone bear. 679 pages. [Ph.D. dissertation. University of Colorado at Boulder. 679 pages. Publication Number: AAT 3057822. ProQuest document 727404501.

As one of Yellowstone's most beloved and enduring symbols, the bear has served as a flashpoint not only for controversies related to the park's evolving policy of ecosystem management, but also for issues of touristic desire and satisfaction with the National Park system. As policy has changed, so have the narratives, or stories told by the NPS in order to explain and promote its policies and itself, e.g., through park literature and correspondence, law enforcement, and changes in the landscape.

In this research, I use the Yellowstone bear as a catalyst through which to examine the relationships between park policies and interpretation, and public reception, and situate the development of these relationships within the broader contexts of environmental history and cultural change. In conclusion, I investigate the success of park narratives and look for opportunities for improved park interpretation. Through archival documents and key informant interviews, I produce an analysis which fills an existing gap in park literature and provide park managers with concrete data which can be used to develop interpretive and educational strategies which are based in a solid understanding of the diverse forces and cultural currents which work in favor of the NPS and its mission, as well as against it.

Results indicate that management and narrative do not only come from the top down, but are the result of a dialectic between policy, cultural waves and visitors. Since the turn of the 20 th century, the narrative of the Yellowstone bear and its related ways of seeing bears have Changes are reflective of shifting policies and attitudes toward nature more generally. These changes have required evolving ways of seeing on the part of Yellowstone's Visitors. The work is significant because it provides a heretofore absent record of visitor history, bear management and its ephemera, and contemporary social science in Yellowstone relative to the issues named above, and demonstrates that the history of bear management in Yellowstone and the motivations behind it are more complex than some other scholars have led the public to believe.

Wyoming Game and Fish Department. 2005. Annual Report of Big & Trophy Game Harvest 2004. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Wyoming Game and Fish Department. 2005. Hunt Area size in Wyoming 2005. Unpublished data. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Zitt, Thomas Joseph. 1992. Reinventing nature in America's first national park: Struggles over management policies in Yellowstone. Ph.D. dissertation. 191 pages. Ohio: Bowling Green State University. Publication Number: AAT 9319757. ProQuest document 746984601

The following is an interdisciplinary study of constructions of nature in American culture. Using Yellowstone National Park as a focal point, this dissertation evaluates nature/culture dichotomies and the potential for their deconstruction in the Greater Yellowstone Ecosystem. To provide a foundation for this effort, the study examines American pastoral and wilderness traditions as revealed in literature, landscape painting and photography, and conservation policy. It then explores the influence of those traditions on the establishment of the park in 1872; on the current interagency effort to create the 10 million acre Greater Yellowstone Ecosystem; and on management policies regarding bears, wolves, elk, and fire. The dissertation concludes that reinscribing Yellowstone National Park as the Greater Yellowstone Ecosystem is a compelling model of how nature/culture dichotomies can be deconstructed without compromising the integrity of natural systems and processes.