



<http://www.csuci.edu/ira/index.htm>

**Application**  
**Instructionally Related Activities Funds Request**  
**2013-2014 Academic Year**

**DEADLINES: Application Submitted to AVP:**  
**Fall and Academic Year 2013-14: 03/01/13**  
**Spring 2014 deadline: 10/01/13**

**Submittal Process:** Applications must be first be signed by your program chair and then submitted to the appropriate AVP for approval. AVP's will next forward application to the IRA Coordinator for review. If there are questions or concerns, you may be asked for revisions or additional information. The IRA Coordinator will then forward applications to the IRA Committee for consideration.

**Fiscal Management:** Project Sponsor's program will be responsible for all costs incurred over and above what is funded through the IRA award and will be responsible for seeing that any revenue that is intended to offset the amount of the IRA award is transferred accordingly.

**Duplicate requests-** if Sponsor is submitting multiple proposals for recurring events involving speakers, musicians, etc., please combine your requests into one proposal.

**Activity Title: Science & Public Policy in Yellowstone National Park (UNIV 391)**

Project Sponsor/Staff (Name/Phone): Amy Denton (437-8458), Scott Frisch (437-2770)

Activity/Event Date(s): 5/29/2014 through 6/5/2014 (tentatively)

Date Funding Needed By: 1 January 2014

*\*\*Please Note that for Fall Requests the earliest that you will be notified of funding availability will be early June 2013 and for Spring Requests early January 2014.*

Previously Funded by IRA? XYES  NO If Yes, what Semester/Year? Spring 2012  
 Proposal(s) # 156 (if known)

Report submitted for previously Funded Activity?: XYES (attached)  NO

**\*Please attach copy of previous IRA Report**

Academic Program or Center Name: 720-Biology (Denton), 769-Political Science (Frisch)

Estimated total Course Fee revenue:

Amount Requested from IRA: (Should match "Total Requested from IRA" on Page 5)

Estimated Number of Students Participating: 12

## Conditions and Considerations Checklist

Please check if any of the following apply to your IRA:

**Artist/Performer/Speaker Fees & Honoraria-** On the Activity Budget, please indicate whether the vendor's price was set by you / CI representative, or is a fee that was set by the vendor themselves.

**Large Event-** For a large event, consultation with the campus Event Coordinator's office at (805)437-8548 is required.

**Equipment Purchase-** If requesting large equipment purchase -over \$200, or will be a fixture installed on campus- Project Sponsor must show proof of correspondence with OPC Administration. In addition, all other purchases must follow Procurement Guidelines.

X **Field Trip-** Sponsor must comply with all policies found at <http://www.csuci.edu/hr/AcademicFieldTripGuidelinesandForms.htm>. If approved, Identified Risks of Participation and Release Agreement must be submitted for each student to the Program Office (Public Folders-HR Forms).

**Involves Human Subject Data Collection for Public Dissemination -Requires IRB Approval.** If Project Sponsor proposes to conduct research with human participants, the proposal may be subject to Institutional Review Board for the Protection of Human Subjects (IRB) review. All research that involves any type of interaction with human subjects – from simple surveys to complex biomedical procedures – must be reviewed and approved by the IRB *prior to* starting the research. Data for "Public Dissemination" indicates interviews/surveys that result in a journal/poster session/newsletter, etc.

**Exempt from IRB Approval** –If your project is exempt from IRB review, include copies of correspondence with IRB Board. It is the Project Sponsor's responsibility to inquire with the IRB **prior** to IRA application submission to determine if the project is exempt from IRB review so that funding is not delayed.

**IT Requirements-** If your activity has IT requirements, your application requires proof of correspondence and approval from IT Administration.

**International Travel-** Requires International Travel application be submitted to Center for International Affairs. Include copy of CIA budget and course syllabus in your IRA application.

**Risk Management Consultation-**Events that involve or engage students directly with a performer or artist (i.e. in a workshop or other than as a passive audience member) will require consultation with Risk Management. Requires proof of correspondence with Risk Management.

**Space/OPC Requirements, Infrastructure/Remodel-**Requires proof of correspondence with OPC Administration.

**Late Submission** - Requires explanation for emergency funding.

Other -

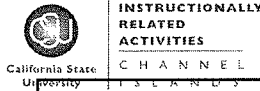
**Application**  
**Instructionally Related Activities Funds Request**  
**2013-2014 Academic Year**

**Instructions and Requirements – Written Portion**

Please provide the following in your application:

1. **Brief Activity Description.** Describe the activity and its relationship to the educational objectives of the students' program or major.
2. **Relation to IRA to Course Offerings.** All IRAs must be integrally related to the formal instructional offerings of the University and must be associated with scheduled credit courses.
  - a. Please list all classes that directly relate to the proposed activity.
  - b. For each class listed in #2a, describe in detail how exactly the IRA activity will be integrated with the class's activities, how often/ on what expected date(s), and to what extent.
3. **Learning Outcomes.** List all expected learning outcomes, as connected specifically with each course listed in #2.
4. **Activity Assessment.** Describe the assessment process and measures that the program will use to determine if it has attained its educational goals. **Please note that a report will be due 30 days after your activity.**
5. **Activity Budget.** Please enclose a complete detailed budget of the entire activity. **Bold** specific items that you are requesting IRA to fund (Page 6).
6. **International Trips.** If your event is an international trip submitted through the Center for International Affairs, you must include a copy of the program budget as submitted to CIA (to ensure congruency between the two budgets), as well as a copy of the course syllabus.
7. **Sources of Activity Support.** Please list the other sources of funding (including course fees), and exact expected amounts of additional support for the activity.
8. **Audience/ Marketing/Promotions.** Who is your intended target audience? How will your event be advertised to students?
9. **Sustainability.** If appropriate, indicate how the content or delivery of the project promotes sustainability at CI.
10. **Images.** For previously funded IRA activities, include copies of images from past IRA activity or activities, demonstrating student participation and levels of students served.
11. **Acknowledgment.** Project Sponsor and Program Chair acknowledge that they have reviewed and accepted the Conditions and Considerations herein.

# IRA Travel Activity Budget



Activity Title: Science & Public Policy in  
Yellowstone National Park

2013-2014

Sponsor Name: Biology and Political Science Programs (Denton/Frisch)

Number of Students Participating: 12

Number of Faculty: 2

I.	Student traveling expenses:	Cost/ea	# Requested	Total	Comments/Additional Notes
	Airfare	\$650.00	12	\$7,800.00	
	Ground Transportation	\$50.00	12	\$600.00	Roadrunner to/from LAX (may be less if flights depart BUR)
	Lodging	\$70.00	12	\$840.00	1 night in Bozeman, may not be necessary
	Registration Fees			\$0.00	
	Entrance Fees			\$0.00	
	Meals (included)	\$70.00	12	\$840.00	Final night group meal in Park; first night meal if late arrival
	Cultural Activities	\$250.00	12	\$3,000.00	Yellowstone Association Institute
	Vehicle/Van Rental	\$190.00	12	\$2,280.00	R/T Bozeman to Yellowstone, transportation & fuel in park
	Other: YAI Overlook Field Campus	\$350.00	12	\$4,200.00	7 nights cabin accommodations
	<b>STUDENT TRAVEL TOTALS</b>	<b>\$1,630.00</b>		<b>\$19,560.00</b>	
II.	Faculty Traveling Expenses:	Cost/ea	# Requested	Total	Comments/Additional Notes
	Airfare	\$650.00	2	\$1,300.00	
	Ground Transportation	\$50.00	2	\$100.00	Roadrunner to/from LAX (may be less if flights depart BUR)
	Lodging	\$140.00	2	\$280.00	1 night in Bozeman, may not be necessary
	Registration Fees			\$0.00	
	Entrance Fees			\$0.00	
	Meals (included)	\$50.00	2	\$100.00	Final night group meal in Park; first night meal if late arrival
	Cultural Activities	\$250.00	2	\$500.00	Yellowstone Association Institute
	Other: YAI Overlook Field Campus	\$350.00	2	\$700.00	7 nights cabin accommodations
	<b>FACULTY TRAVEL TOTALS</b>	<b>\$1,490.00</b>		<b>\$2,980.00</b>	
III.	Operating Expense Budget	Cost/ea	# Requested	Total	Comments/Additional Notes
	Supplies			\$0.00	
	Other:			\$0.00	
	Other:			\$0.00	
	<b>OPERATING EXP. TOTALS</b>	<b>\$0.00</b>		<b>\$0.00</b>	
IV.	Out of Pocket Student Expenses	Cost/ea	# Requested	Total	Comments/Additional Notes
	Health Insurance			\$0.00	
	Tuition/Registration			\$0.00	
	Travel Insurance	\$75.00	12	\$900.00	
	Out of Pocket Meals	\$250.00	12	\$3,000.00	
	Other:			\$0.00	
	<b>STUDENT EXP. TOTALS</b>	<b>\$325.00</b>		<b>\$3,900.00</b>	
V. UNIV 392 INTERNATIONAL TRIPS ONLY. Total costs of the trip. Please Note that Formulas Calculate Automatically					
	Total Student Traveling Expenses			\$19,560.00	
	Faculty Travel Expenses, if funded at 100%			\$2,980.00	
	Operating Expenses, if funded at 100%			\$0.00	
	<b>TOTAL IRA FUNDING REQUESTED</b>			<b>\$22,540.00</b>	
	Out of Pocket Student Expenses			\$3,900.00	Not funded by the University
UNIV 391/392 & International Trips only					
	Maximum IRA student funding @ 2/3rd of student total cost			\$13,105.20	
	1/3 of total cost payable by students through course fee			\$6,454.80	
	<b>TOTAL IRA FUNDING REQUESTED FOR INT'L TRIPS</b>			<b>\$16,085.20</b>	
	Out of Pocket Student Expenses			\$325.00	Not funded by the University

**1. Activity Description:** We are requesting IRA support to partially fund a trip to Yellowstone National Park as an intensive field study component of **Science and Public Policy in Yellowstone National Park**, a proposed section of UNIV 391 (United States Travel-Study Experience), during Spring 2014. We taught this course in Spring 2012 with very positive student outcomes and feedback (please see attached IRA report) and a similar, IRA-supported course, to the Arctic National Wildlife Refuge, was offered for the first time in Spring 2009.

In Spring 2014, we would like to offer **Science & Public Policy in Yellowstone National Park** as an independent, three-unit course, using the UNIV 391 designation. At the end of the semester (tentatively 29 May - 5 June 2014), twelve students and two instructors will travel to Yellowstone to study the science behind, and policy matters surrounding, various national park land-use controversies including wolf reintroduction, bison migration, and fire suppression/recovery. Weekly meetings during the semester will cover topics including an introduction to the park's history, natural and cultural resources, current issues and controversies, a briefing on structured information gathering and conflict resolution, a primer on environmental writing and journaling, and a pre-trip orientation. This course will fulfill the cross-disciplinary course requirement for Biology majors in the Evolution, Ecology, and Organismal emphasis (the EEO emphasis applies only to students under catalog years prior to 2013-2014), or majors may use this course for any three-unit upper division biology elective. Political Science students will be allowed to substitute this course for three units of the required fifteen units of upper division elective coursework required for the degree.

We will use weekly meetings during the spring semester to provide background and preparation, then spend seven days in Yellowstone immersing our students in a combination of classroom and field activities covering a variety of current controversies including wolves, bison, wildland fire management, snowmobiles, bear management, bio-prospecting, and invasive species. We will spend the week examining the science and history each topic: observing wildlife, exploring appropriate natural resources and park ecosystems, and talking with National Park Service biologists, rangers, and administrators, as well as resource experts such as Montana Department of Livestock veterinarians, Montana Department of Fish, Wildlife, & Parks scientists, and researchers from universities around the U.S. conducting field work in Yellowstone. To better understand all positions on the issues, we will speak to members of mainstream and activist environmental groups, local business owners and outdoor recreation providers, ranchers, local policymakers and government officials. Wildlife viewing, presentations, classroom space, and meetings with scientists, park employees, local experts and interest groups will be arranged in cooperation with the Yellowstone Association Institute (see Budget Justification). The following is a proposed itinerary, similar to the 2012 trip:

**Day 1: Fly into Bozeman, Montana, drive to Yellowstone National Park.**

1. We will fly into the Bozeman airport and using rented vehicles, drive the 90 miles south into Yellowstone National Park. We will be staying in cabins at the Yellowstone Association's Overlook field campus, which is about 1.5 miles outside of Gardiner, MT, and the north entrance to the park. We will purchase

food and supplies for the week in Gardiner, then depending on the time, drive and/or hike through the park to familiarize ourselves with the landscape.

**Days 2-8: Yellowstone National Park.** Four days in the park will be spent in the field, classroom, and traveling outside the park to talk to local citizens and activists. Park controversies that will be covered include:

1. Gray wolves: science, policy, and impacts of reintroduction of an endangered species to the Yellowstone ecosystem.
2. Wildfire management: the science behind the evolving 2003 Federal Wildland Fire Policy and the post-fire response, economic and ecological consequences of the 1988 fires in the park (over 793,000 acres burned during these fires).
3. Bison management: science, policy, and impacts of bison migration outside park boundaries.
4. Other topics (subject to coordination constraints): the science and policy behind predator management (*e.g.*, grizzly bears), science, policy, and impacts of winter use of snowmobiles in the park, invasive fish and plant species, and bio-prospecting.

We will have 1-2 free days in which small groups of students work on their individual topics or explore more park issues. Evenings we will be for daily recap and discussions. One group meal is planned for the final evening at the historic Old Faithful Lodge, including an end-of-trip debriefing and student project updates/presentations.

## **2. Relation to CI course offerings:**

We propose offering **UNIV 391: Science & Public Policy in Yellowstone National Park** as a stand-alone, 3-unit course. Structurally, this course will be based on BIOL/POLS 345: Science & Public Policy, an interdisciplinary, GE course that examines the relationship between science, politics and public policy and prepares students to make informed decisions concerning the societal implications of many rapidly advancing avenues of scientific research. Development of this course was the direct outcome of an award from the Center for Integrative Studies. We co-taught Science & Public Policy in Spring 2006, 2007, 2009, 2011, 2012, and it is scheduled for spring 2014 as well. Through its history, this course has covered the basics of U.S. policy-making, the scientific method, and in-depth case studies of climate change, embryonic stem cell research, genetically modified food crops, public immunization, endangered species, and the creation of the Channel Islands National Park. In response to student comments expressing the desire for more in-depth coverage of specific, current issues, we offered the Arctic Refuge field trip as an optional high-impact, hands-on experience component to BIOL/POLS 345, focusing on the science and policy issues surrounding climate change in the Alaskan arctic. The six participating students reported deep and lasting impacts from their field study experience in the arctic and the UNIV 391 Yellowstone course was designed to offer a greater number of students a similar intensive field experience at the intersection of science and policy. The IRA-funded field trip will be

integrated into the weekly semester activities as outlined in the Activity Description section above.

### Course Rationale: Why Yellowstone?

Established in 1872, Yellowstone is the world's first national park. The park encompasses over 2.2 million acres and is home to 67 species of mammals including grizzly bears, gray wolves, bison, and elk, 322 bird species, 15 fish species, 10 reptiles and amphibians, 1200 plant species and over 400 species of extreme thermophiles (microbes that thrive at high temperatures). Preserved within the park are more than 10,000 thermal features including 300 active geysers, as well as archeological and cultural sites associated with 26 Native American tribes and early U.S. history. Yellowstone's iconic status often intensifies conflicts over public land usage and the park is an excellent natural laboratory in which students can explore the scientific and political aspects of both long-standing and emerging controversies. Enduring issues include recreation vs. preservation and wildlife management (wolf reintroduction, bear management, endangered species recovery, hunting, protection of private local sheep and cattle herds, wildfire management). Newer concerns include bio-prospecting (mining Yellowstone's thermophilic species for profit in the biotechnology industry), invasive species, and the migration of Yellowstone bison outside park boundaries in the winter. Many of these free-roaming bison, and to a lesser extent, elk, carry the disease brucellosis and put livestock in the surrounding communities at risk for infection.

### 3. Learning Outcomes:

The following student learning outcomes for BIOL/POLS 345 (Science & Public Policy) will be applied to UNIV 391: Science & Public Policy in Yellowstone National Park, modifications specific to UNIV 391 appear in **bold**.

Students completing this course will be able to:

- Discuss news media depictions of scientific policy issues **in Yellowstone National Park**
- Discuss the science that underpins major issues of public policy covered in class, **such as bison/brucellosis, wolf reintroduction, wildland fire management, etc.**
- Distinguish high quality scientific research from writing that is opinion or ideology driven
- Evaluate claims made by policy makers regarding the scientific merit of public policies (**relevant to YNP issues, e.g., endangered species, fire suppression, destruction of brucellosis-infected livestock**)
- Describe the US science policy making process and evaluate the role of interest groups (**e.g., ranchers, outfitters, state and local health officials, environmental activists, park visitors, etc.**) in decision making
- Present scientific information in a format understandable by policy makers
- Locate serious scientific scholarship on issues of public importance

#### **4. Activity Assessment:**

Yellowstone's interior remains largely inaccessible during spring break, and is not hospitable for alpine hiking and wildlife viewing until May, so by necessity, this trip must take place after the end of the Spring 2014 semester. The neutral "RP" (Report in Progress) designation will be assigned to students as a temporary grade, then changed immediately upon return and completion of course requirements. This procedure was used in previous trips and did not affect transcript and diploma processing for the graduating seniors in the class. Course assessment will consist of weekly brief quizzes and a final project on a topic of the students' choice, developed from an idea or theme introduced in the weekly sessions. Following the trip each student will be responsible for preparing a screencast, poster, or video based on this topic and expanded using images and experiences gained on the trip. These multimedia creations will be posted on the course website, linked to the Biology and Political Science program pages, and used as teaching materials in future BIOL/POLS 345 sections.

#### **5. Activity Budget and Justification:**

<u>Costs associated with course fee – Student traveling expenses (per student)</u>	
<b>Roundtrip airfare LAX-Bozeman, MT</b>	<b>\$650</b>
<b>Roadrunner shuttle service to/from LAX</b>	<b>\$50</b>
<b>Motel accommodation in Bozeman</b>	
<b>(1 night, may not be necessary – depends on flights)</b>	<b>\$70</b>
<b>Lodging at Yellowstone Association</b>	
<b>Institute's Overlook Field Campus (7 nights)</b>	<b>\$350</b>
<b>Yellowstone Association Institute tours/activities (see below)</b>	<b>\$250</b>
<b>Final culminating group meal in park, 1<sup>st</sup> night meal if necessary</b>	<b>\$70</b>
<b>Transportation R/T Bozeman to Yellowstone, and</b>	
<b>within the park (vehicle rental and fuel)</b>	<b>\$190</b>
	<b>SUB-TOTAL</b>
	<b>\$1630</b>
 <u>Costs associated with course fee – Faculty traveling expenses (total)</u>	
<b>Roundtrip airfare LAX-Bozeman, MT</b>	<b>\$1300</b>
<b>Roadrunner shuttle service to/from LAX</b>	<b>\$100</b>
<b>Motel accommodation in Bozeman</b>	
<b>(1 night, may not be necessary – depends on flights)</b>	<b>\$280</b>
<b>Lodging at Yellowstone Association</b>	
<b>Institute's Overlook Field Campus (7 nights)</b>	<b>\$700</b>
<b>Yellowstone Association Institute tours/activities (see below)</b>	<b>\$500</b>
<b>Final culminating group meal in park</b>	<b>\$100</b>
	<b>SUB-TOTAL</b>
	<b>\$2980</b>
 Total student traveling expenses (\$1630 X 12 students)	 <b>\$19,560</b>



Maximum IRA funding (@ 2/3 cost)	\$13,105
Faculty traveling expenses	\$2980
<b>TOTAL IRA request</b>	<b>\$16,085</b>

Budget Justification:

IRA funding requested to subsidize two-thirds of the total costs for twelve students plus faculty traveling expenses. The Yellowstone Association Overlook Field Campus, located 1.5 miles outside the north entrance to the park, will provide cabins and shared full kitchens for all participants, which will reduce students' out-of-pocket expenses for meals. The Yellowstone Association Institute will also organize and facilitate our activities in the park, including park fees and permits, spotting scopes, and telemetry location for wildlife viewing, classroom space, talks by park scientists and administrators, and arranging interviews with local ranchers, businesspeople, activists, and government officials. Funds for a group meal in the Old Faithful Lodge are requested as a part of a culminating evening, where the class can discuss our experiences and students can present updates of their course projects for group input. This dinner was an important and meaningful element of the 2012 trip. Because there are not many daily flights in and out of Bozeman, one night's motel accommodation near the Bozeman airport is requested in the event we cannot coordinate a flight with the long drive between Bozeman and Yellowstone – it is our hope that this will not be required. Similarly, if we arrive in the park too late to shop for food, we request funds for a modest group meal on the first night. Van rentals are necessary for the drive between Bozeman and Yellowstone, and for transportation within park at times other than those covered by Yellowstone Association Institute activities. Costs for instructor travel are requested because contributions of both instructors are critical: this is a truly interdisciplinary course. Denton has over 20 years experience conducting biological fieldwork in alpine settings and is familiar with the terrain, conditions, flora, and fauna of Yellowstone. Frisch provides expertise in public policy and the history of environmental policy-making in the U.S. He has written about environmental policy and politics during the Carter administration, and is working on a project analyzing the influence of President Carter on passage of the Alaska National Interest Lands Conservation Act. In addition, Denton and Frisch have both participated in a weeklong civic engagement program created by the American Democracy Project and the American Association of State Colleges and Universities (AASCU) entitled *Stewardship of Public Lands: Politics in the Yellowstone Ecosystem*. The workshop was designed to support faculty as they develop courses to help undergraduates understand the value and limitations of various interest groups (scientists, policymakers, activists, local business people) in controversies involving Yellowstone's public resources.

**7. Sources of Activity Support:**

Course fees will provide 1/3 of the activity budget. Except for meals on the first (possibly, depends on arrival time) and last evenings, students will pay for their own food, shared kitchen facilities will minimize costs. Out-of-pocket student expenses for meals and travel insurance should be approximately \$325. The Yellowstone Association

and biology program will provide all students with copies of the course text: *Yellowstone Resources and Issues 2014*. Both Denton and Frisch will donate all teaching time required for UNIV 391 and will not charge weighted teaching units to their program budgets.

### **8. Audience/Marketing/Promotions:**

If funded, details of the course and trip will be disseminated to all CI students before the first day of the Spring 2014 semester. The course will be advertised via postings on campus green-screens and social media (e.g., CI Biology's Facebook page), and direct outreach from faculty. Applications from students in all majors will be encouraged. Costs, physically demanding nature of the travel, and trip timing will affect the number of students who are interested in a field course, and restrictions imposed by Yellowstone Associate Institute field accommodations and in-park transportation limit the maximum number of student participants to twelve. Interested students will complete an application prior to or during the first week of class, and will be evaluated on their grade-point averages, faculty recommendations, and two short essays in which they describe their motivations and expectations and demonstrate their understanding of conditions they may encounter on the trip. If more than twelve students submit acceptable applications, participants will be chosen by lottery and a list of alternates generated.

### **9. Sustainability:**

**Science & Public Policy in Yellowstone National Park** supports the University's mission in several ways. Environmental stewardship is a core principle of our strategic initiative on sustainability. This course will raise awareness of sustainability by offering students a unique view of ongoing national debate on the protection of natural resources and the role of public lands. Furthermore, Yellowstone is currently undergoing a major effort to become the national park at the forefront of national sustainability efforts. Students in this course will become familiar with Yellowstone's enhanced institutional sustainability practices including major recycling, composting, and fuel efficiency initiatives, water conservation, LEED-certified construction, use of green cleaning products, replacement of wooden boardwalks with those made from recycled plastic, renewable and clean energy sources for park facility heating, and green-practice initiatives for the park's major concessioners.

Participation in this course will provide CI students an opportunity to experience the natural, economic, political, and cultural environment of Yellowstone firsthand, and allow them to view the intersection of science and public policy, and the process of public decision-making, through the perspectives of a diverse group of stakeholders.

### **10. Images:**

Attached

### **11. Acknowledgement:**

Attached

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**Instructional Related Activities  
Report Form**

SPONSOR	DEPARTMENT
Amy Denton Scott Frisch	Biology Political Science
ACTIVITY TITLE	DATE (S) OF ACTIVITY
UNIV 391-03: Science and Public Policy in Yellowstone National Park	6/30/2012 – 7/6/2012

**PLEASE EXPLAIN (1) DESCRIPTION OF ACTIVITY; (2) HOW DID THE ACTIVITY RELATE TO A COURSE(S); AND (3) WHAT YOU LEARNED FROM THE PROCESS.**

1. Established in 1872, Yellowstone is the world's first national park. The park encompasses over 2.2 million acres and is home to a tremendous diversity of plants and wildlife, as well as archeological and cultural sites and more than 10,000 geothermal features. Yellowstone's iconic status often intensifies conflicts over public land usage and the park is an excellent natural laboratory in which students can explore the scientific and political aspects of both long-standing and emerging controversies involving recreation vs. preservation and wildlife management. Our class focused on two specific issues: the reintroduction of wolves to the greater Yellowstone region and the migration of Yellowstone bison outside park boundaries in the winter. Many of these free-roaming bison, and to a lesser extent, elk, carry the disease brucellosis and put livestock in the surrounding communities at risk for infection. We used monthly meetings during the spring semester to provide background and preparation, then spent seven days in Yellowstone immersing our students in a variety of activities including wildlife observation, exploration of natural resources and park ecosystems, and talking with relevant stakeholders to better understand all positions on the environmental, economic, and social impacts of Yellowstone wolves and bison on the park itself and the surrounding region.

To study wolves, we went wolf-watching several times at various locations within the park and discussed wolf biology with Yellowstone Association Institute biologist Brad Bulin, toured sites important to the wolf reintroduction program such as the 1995 acclimation pens and the earliest dens, interviewed rancher/outfitter Martin Davis about how wolves in Yellowstone affect his cattle production and elk-hunting businesses, and learned about the early history of wolf reintroduction from National Park Service wolf biology technician Rick McIntyre.

Our class observed many large herds of bison in the park and toured the NPS Stephens Creek bison corrals with Dr. Rick Wallen, an NPS biologist who was able to give us a feel for what the park bison go through during the annual brucellosis testing and quarantine process. We also visited Druska Kinkie, whose family has operated a cow and calf ranch in the Paradise Valley outside of Yellowstone for over 100 years. Ms. Kinkie, a rancher and activist, vividly described the impacts of roaming bison and

brucellosis from the Montana rancher's point of view.

During our trip we had outstanding wildlife viewing and in addition to wolves and bison, our students got to see important and/or endangered North American wildlife species such as elk, pronghorn, grizzly bear, black bear, badger, coyote, mule deer, bighorn sheep, mountain goat, long-tailed weasel, bald eagle, golden eagle, osprey, peregrine falcon, great horned owl, kestrel, sandhill crane, and boreal toad. Finally, students were able to explore the park's geological, ecological, and historical features both with our Yellowstone Association Institute guide and on their own.

2. Science & Public Policy (BIOL/POLS 345) is an interdisciplinary, GE course that examines the relationship between science, politics and public policy and prepares students to make informed decisions concerning the societal implications of many rapidly advancing avenues of scientific research. Development of this course was the direct outcome of an award from the Center for Integrative Studies. We co-taught Science & Public Policy in Spring 2006, 2007, 2009, 2011, and 2012, covering the basics of U.S. policymaking, the scientific method, and in-depth case studies of climate change, embryonic stem cell research, genetically modified food crops, public immunization, endangered species, and the creation of the Channel Islands National Park. In response to student comments expressing the desire for more in-depth coverage of specific, current issues, in 2009 we offered an IRA-funded field course in the Arctic National Wildlife Refuge as an optional high-impact, hands-on experience component to BIOL/POLS 345, focusing on the science and policy issues surrounding climate change in the Alaskan arctic. To provide this type of field-based, intensive science and policy experience to a larger number of students, in spring 2012, we offered **Science & Public Policy in Yellowstone National Park** as an independent, three-unit course using the new UNIV 391 designation. Twelve students (three political science majors, four ESRM majors, five biology majors) participated (see attached roster). This course can be used to meet the cross-disciplinary course requirement for Biology majors in the Evolution, Ecology, and Organismal emphasis, or majors may substitute this course for any three-unit upper division biology elective. Political Science students will be allowed to substitute this course for three units of the required fifteen units of upper division elective coursework required for the degree.

3. We learned several things from this experience, and hope to incorporate them into future course offerings. First, we learned what a large and enduring impact this first-hand experience had on our students (see students' emailed comments and project acknowledgments, attached). Students were deeply moved by all that they saw and learned about the intersection of the Yellowstone region's scientific, conservation, park management and local ranching communities. It was very gratifying for us as educators to witness how engaged the students were with the issues; we frequently caught them talking about the course topics during their free time and several of them are seriously interested in graduate programs or jobs that would allow them to stay involved in these matters.

We also learned how well our students rise to rigorous physical and mental challenges they do not typically experience in on-campus classroom courses. We found that our students could be tough, adaptable, curious, adventurous and sensitive to unfamiliar ways of life (e.g., cattle production).

Finally, we learned that students would get even more out of this field experience with

additional pre-trip preparation. To this end, we would like to offer future sections of this course with a weekly or twice-monthly schedule of meetings. We will also require some type of assessment to be completed earlier in the semester in order to expedite the grading process.

Student comments and poster projects are attached to this form. In addition, a video made by student participant Evan Lashly may be viewed here:

<http://www.youtube.com/watch?v=9I2KrBDw3qc>

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**From:** i@gmail.com>  
**Date:** July 24, 2012 11:39:57 AM PDT  
**To:** <amy.denton@csuci.edu>  
**Subject: Re: 2122 (Spring 2012) US TRAVEL STUDY EXPERIENCE-03**

Hi Amy,

For your final IRA report:

For me one of the highlights of the trip was being able to discuss the bison and wolf issues with those closest to the issues on both sides. These are issues that are easy to have a strong opinion about when you are isolated in a classroom. After we met with the ranchers it was much harder to take a strong stand against the individuals who are fighting for their livelihood, the way I typically would have when studying the issue in the classroom. This week gave us the opportunity to meet real people who dealing with bison and wolf issues daily and don't have the luxury of allowing someone else to find a solution.

Thanks again for the great trip!

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**From:**

**Date:** July 30, 2012 2:38:26 PM PDT

**To:** Amy Denton <amy.denton@csuci.edu>

**Subject: Re: 2122 (Spring 2012) US TRAVEL STUDY EXPERIENCE-03**

Hi Amy,

Feel free to post the video wherever you like, here's a few sentences about the trip:

US TRAVEL STUDY EXPERIENCE-03: Science and Policy in Yellowstone National Park is absolutely a highlight of my academic career at CSUCI so far. The experience in Yellowstone opened my eyes to the huge variety of opportunities within the National Park system. The trip further kindled the fire of interest I have in the Park Service as a career opportunity, which I am actively persuing. Our guide, Brad Bulin from the Yellowstone Association, was particularly helpful. Brad was incredibly knowledgable, friendly and helpful. His knowledge and interpretation of our surroundings in the park was informative and engaging. This class has made me want to persue more schooling in the fields of wildlife management and field methods.

Thank you!

Evan

# UNIV 391: Science & Public Policy in Yellowstone National Park, 2012

L to R (bottom): Amy Denton, Nicole Schumacher, Isaac Moorthy, Evan Lashly, Steven Hoeckendorf, Stefan Goehring

(top): Amber Lessing, Erika Sanchez, Whitney Cromley, Cameron DeMaranville, Lauren Boross, James Brown, Casey Padginton, Scott Frisch



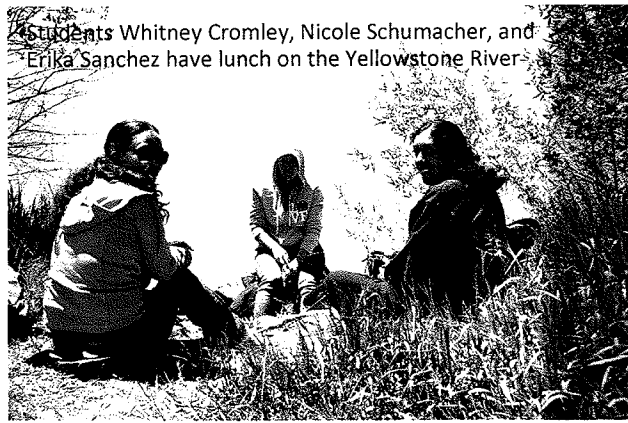
Students Amber Lessing and Evan Lashly

Bison management discussion with NPS biologist Rick Wallen



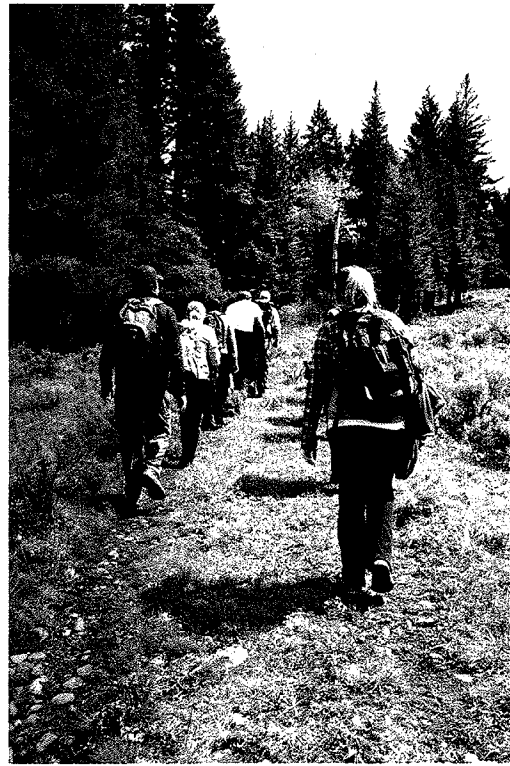
On Bunsen Peak summit (8564')

Students Whitney Cromley, Nicole Schumacher, and Erika Sanchez have lunch on the Yellowstone River





Studying wolf/elk interactions with Yellowstone Association biologist Brad Bulin



Student Cameron DeMaranville talks with rancher/outfitter Martin Davis

Exploring the history of wolf reintroduction to Yellowstone at the original 1995 acclimation pens



Student Stefan Goehring examines wolf pelt



Discussing bison and brucellosis with rancher/activist Druska Kinkie



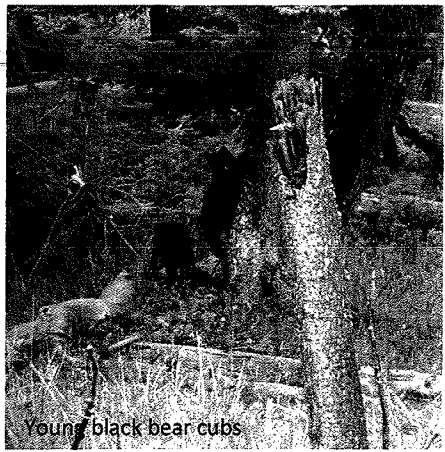
ighting of a boreal toad, one of Yellowstone's endangered species

Wolf watching in the Lamar Valley



NPS wildlife technician Rick McIntyre recounts the history of reintroduction to Yellowstone as he uses radio telemetry to locate wolf packs for our class to observe

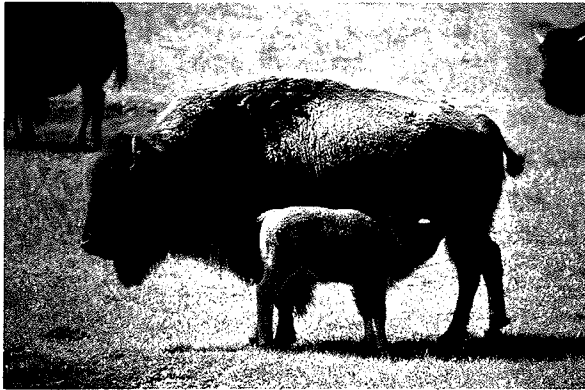




Young black bear cubs



Student Isaac Moorthy with elk skull







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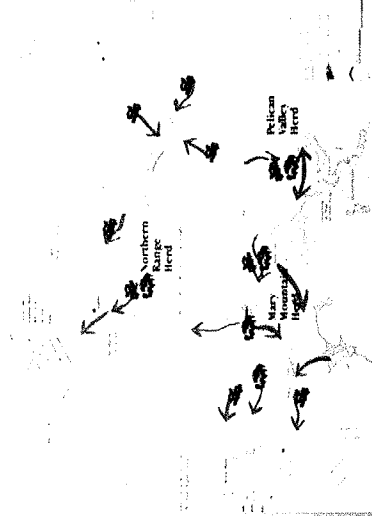
# The Bison Dilemma in Yellowstone National Park

Cameron DeMaranville • Science and Public Policy in Yellowstone National Park • Amy Denton and Scott Frisch

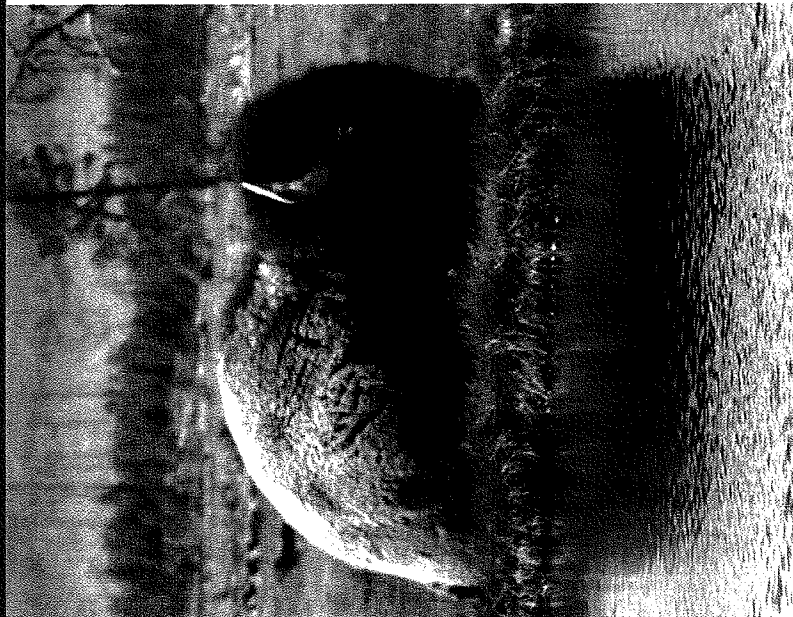
## Introduction

Bison (*Bison bison*) are the largest mammals in Yellowstone and have persisted since prohibitive times, although fewer than 50 native bison remained here in 1902 due to excessive hunting practices (National Park Service, 2012). Since then, the population has recovered and now consists of over 3,000 individuals. Unfortunately, bison populations are now threatened by a bacterial disease called brucellosis. *Brucella abortus* is a disease caused by bacteria in the genus *Brucella*, which causes weight loss, abortion, and reduced milk production in domestic cattle and other ruminants, undulant fever in humans, and a range of outcomes in wildlife (National Park Service, 2012). Brucellosis is thought to have been introduced to the USA in the 19th century and was previously widespread in cattle and swine in the USA (Kippenrick, 2009).

Bison spend the summer months grazing the high plateaus within the park boundaries. During the winter months, bison migrate into the northern range. Unfortunately, this range is not encompassed by the boundaries of the park, which creates a dilemma with local cattle ranchers.



Most of Yellowstone's wildlife move freely across administrative boundaries on a seasonal basis. Bison however, are not always welcome outside the park. Managers have tried to limit bison out of parks outside the park through public hunting, luring bison back inside park boundaries, capture, testing for exposure to brucellosis, and shipping them to slaughter (National Park Service, 2012). When bison move beyond an established tolerance area the control procedures are implemented to enforce spatial and temporal separation between bison and cattle.



## Current Management (IBMP)

In 2006, the Interagency Bison Management Plan (IBMP) was developed as a cooperative, multi-agency effort that guides the management of bison and brucellosis.

The State of Montana is responsible for managing bison when they leave the park and is the lead agency when conducting capture operations in the western Special Management Area. National Park Service is responsible for all actions conducted within the park and is responsible for keeping bison from leaving the park in the area of Reese Creek along the northern Special Management Area (National Park Service, 2012).

- Manage bison to prevent brucellosis transmission to cattle;
- Manage bison that leave Yellowstone National Park and enter the State of Montana;
- Maintain Montana's brucellosis-free status for domestic livestock.

## Future Goals

Although it has been shown that the risk of brucellosis transmission from bison to cattle is unlikely and has never been recorded, the consequences of a transmission could have serious effects on the cattle industry. Brucellosis is a zoonotic disease that can be transmitted to humans and other animals through eating, drinking, eating animal products, and contact with animal products (Kippenrick, 2009).

As the cooperative State-Federal brucellosis eradication program nears its goal of eliminating *Brucella abortus* from U.S. livestock herds, the persistence of brucellosis in bison and elk in the Greater Yellowstone Area (GYA) remains problematic because of continued exposure to livestock (USDA, 2010). Although no cases of bison transmission are known, elk are considered vectors of the disease and several cases have been reported. For the time being, the most efficient way to prevent transmission is to prevent exposure from wildlife.



## Literature Cited

IBMP. (2010). *Interagency Bison Management Plan Library*. Retrieved July 9, 2012, from [http://www.nps.gov/yell/learn/management/plan\\_library.htm](http://www.nps.gov/yell/learn/management/plan_library.htm)  
 Kippenrick, M. (2009). Wildlife-livestock contact: the risk of pathogen transmission from bison to cattle outside Yellowstone National Park. *Journal of Applied Ecology*, 47, 476-483.  
 National Park Service. (2012, 6-30). *Yellowstone Bison*. Retrieved 7-2, 2012, from NPS. <http://www.nps.gov/yell/learn/science/bison.htm>  
 USDA. (2010). *National Brucellosis Eradication Zone Proposal*. United States Department of Agriculture Animal and Plant Health Inspection Services/Veterinary Services.





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# Wolves of Yellowstone

Amber Lessing, Nicole Schumacher, & James Brown • Dr. Amy Denton & Dr. Scott Frisch • UNIV 391-03

## Introduction



From May 30 through June 7, 2012, we embarked on a trip to Yellowstone National Park for a CSUCI course Science & Public Policy in Yellowstone National Park. We stayed in Glacier, MT, which is the gateway to the park. Our trip was led by Dr. Amy Denton, a professor at CSUCI. We were joined by Amber Lessing and James Brown for the duration of our stay. Our guide Brad Smith was extremely knowledgeable about the issues regarding wildlife management in YNP. The primary wildlife issues that we focused on were wolf management and wolf reintroduction. During our time in the park, we had the opportunity to speak with several biologists who were involved in the reintroduction of wolves to the park. We found the biologists restoring the wolves to be of great interest, so that is what our focus is going to be with this poster.

## Wolf Extirpation



(WOLF RESTORATION)

The Northern Rocky Mountain gray wolf (*Canis lupus*) was native to the Yellowstone National Park since before the arrival of humans. Hunting and predator control quickly reduced the wolf population into the early 1900s. By the 1970s there was no evidence to suggest a wolf population in the park. In 1974 the wolves were listed as an endangered species and thereby protected from hunting and predator control. During this time plans were drawn up to reintroduce the Northern Rocky Mountain wolves back into the National Park.

## Wolf Reintroduction

In 1973 the U.S. Fish & Wildlife Service (USFWS) proposed the Northern Rocky Mountain Wolf Recovery Plan which was approved by the U.S. Department of the Interior. The plan included the following: The Northern Rocky Mountain Wolf Recovery Plan requires a road map to recovery of the gray wolf in the Rocky Mountains. The primary goal of the plan is to remove the Northern Rocky Mountain wolf from the endangered and threatened species list by securing and maintaining a minimum of 10 breeding pairs of wolves in the wild.

In October 1981, Congress sent funding to the USFWS to partner, along with the NPS and the U.S. Forest Service, an Environmental Impact Statement (EIS) on reintroducing wolves to Yellowstone and central Idaho. The USFWS created special regulations outlining how wolves would be managed as a nonessential population under section 10(j) of the Endangered Species Act. These regulations initially took effect in November 1984.

In 1985 the experimental population of 14 wolves were to be released in what is called a "soft release" where the wolves would be held in a suitable location where they are penned for a period of time before they are released into the wild. This soft release discourages the wolves to immediately travel far from the pen. The pen we went to was approximately 1 acre surrounded by chain-linked fence with a 2 ft. over hang to prevent climbing out, and a 4 ft. slit to prevent digging out of the pen. There were wooden box shelters for the wolves as well. In 1986, 17 additional wolves were brought into YNP.



From 1985 forward, the wolf population went through increases and decreases. But by the end of 2011 there were a total of 88 wolves in 10 packs and 2 events in YNP. Because of such increases in numbers in Montana and Idaho, the USFWS has been able to reduce the number of wolves in Yellowstone National Park, although they were still prohibited from Park boundaries. However, if the wolves performed outside of Park boundaries they could be legally hunted due to unclassified essential habitat restoration.

## 2011 Yellowstone Wolf Pack Territories



(GEOGRAPHIC INFORMATION SYSTEMS)

## Controversy with Wolf Reintroduction

There are controversies surrounding the reintroduction of wolf to the ecosystem with the ability to recover from ravages. After the reintroduction of wolves to the YNP area, all the population of the wolf in the park were actually removed. These wolves would produce easy prey for coyotes and sheep, which angered the ranchers. To help ranchers with their loss of livestock, the Department of Wildlife set up a wolf bounty program. Ranchers were allowed to kill any wolf that was found to be a threat to their livestock. However, according to Martin, many ranchers that were allowed to kill any wolf that was found to be a threat to their livestock. Also, these ranchers are required to show proof that a wolf caused their loss, and many of these attacks have been determined to have been caused by bears. However, since the wolves have been removed from the Endangered Species Act they are legally allowed to be hunted during open season on areas outside of the national park.



## Acknowledgements

First and foremost we would like to thank our amazing professors, Dr. Amy Denton and Dr. Scott Frisch for giving us the opportunity to visit Yellowstone National Park. They are excellent teachers and their passion for the wolf reintroduction project is truly inspiring. We would also like to thank our field guides, Amber Lessing and James Brown, for their guidance and support throughout the trip. Our guide Brad Smith was the best guide we could have asked for. He was an experienced naturalist and was able to provide us with a wealth of information about the park and its history. We would also like to thank the University of California, Santa Barbara (UCSB) for providing us with this amazing opportunity to visit the park. We hope that other students will participate in the same in future courses, we have taken at UCSB. We hope that other students will participate in the same in future courses of study in the future. Thanks to all for a wonderful time!

## References

- U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, Montana Park, Wildlife & Parks, Idaho Park and Game and USDA/Wildlife Services, 2008. Rocky Mountain Wolf Recovery, 2008 Annual Report. E. J. Burch, ed. USFWS, Ecological Services, 255 Shepard Way, Helena, Montana, 59601, USA.
- "Wolf Restoration", n.d. National Park Service. 15 July 2012. <http://www.nps.gov/yell/wolfrestoration.htm>
- Smith, D. D., Stahler, E., Albert, R., McIlroy, M., Metz, J., Irving, R., Raymond, C., Anton, K., Casady-Curry, and N. Bunnick. 2011. Yellowstone Wolf Project: Annual Report, 2010. YCR-2011-08. National Park Service, Yellowstone National Park, Yellowstone Center for Resources, Yellowstone National Park, Wyoming.







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# Yellowstone Wolf and Bison Dilemmas

Stephen Hoekendorf • Amy Denton & Scott Frisch • Science and Public Policy in Yellowstone National Park



## Introduction

~Whenever actions are taken to protect wild animals in certain regions of the country, there is almost always a public backlash. This happened in Yellowstone in regards to both the wolf and bison management programs. There are reasons for and against both these management programs. A group of 12 students and 2 professors traveled to Yellowstone to get information on these issues firsthand from individuals working inside the park and ranchers who are living in the surrounding area.



## Wolf Management

**Issue:** Wolves pretty much were wiped out, making way for the cattle ranchers to come in and raise cattle. Then in the mid-90s wolves were reintroduced into Yellowstone National Park (YNP) so as to create a proper food chain with a strong predator.

**Problem:** Wolves on occasion kill cattle, but they keep park elk numbers down.

Rick McIntyre the Biologist who has been overseeing the wolf reintroduction stated that YNP made an agreement with the state and communities surrounding the park that they would manage the wolf population only within the park. YNP should not try to step in and regulate outside the park because it would make it look to the public as if they were going back on their word and agreement. At the same time though, the states surrounding the park should tread lightly with the issuing of wolf hunting permits so as to not mess up genetics.

Then we spoke with a rancher, Martin Davis. He stated something similar to Rick. He said that YNP should stick to their part of the bargain and not try and stop the cattle ranchers from shooting wolves on their property. Also wolves are killing many elk so the hunting has dropped a great deal. He contributes this to the wolves killing an abundance of elk. Many in the area depend on a big game animal to have it.



## Bison Management

**Issue:** Yellowstone Bison are one of the only genetically pure wild bison in the world.

**Problem:** These bison carry a dangerous disease called brucellosis.

We spoke with a Bison Biologist who works at the bison pens at the north side of the park. His most memorable line of the entire discussion was when he stated that "the best way to conserve bison is by eating them." The reason he said this was because the bison are not being taken down as much as they hoped by wolves. It is also important to understand what brucellosis is. This is a disease that is transmitted after the birthing of calves. Bison and elk that come into contact with birth by-products. The disease can't affect humans, but can affect other animals (ex. Cattle). Brucellosis leads to miscarriages in livestock which can lead to lost money and the herd quarantined by the FDA.

The rancher stated that the bison should be kept in the park and purged of the disease (Vaccinated or killed). Testing all the cattle if one is found to test positive for the disease, as required by the FDA, is extremely hard on the ranchers. Also, if they are stopped from selling their beef then the ranchers' paycheck (in October) will be delayed and that is a possibility that they could be put in a bind.



## Possible Solutions/Conclusion

~These are hard issues/problems to solve. While in Yellowstone listening firsthand to both sides of the issue, we were shown that both the ranchers and biologists have legitimate concerns. (Lifestyle & Livelihood vs. Science & History).

Starting with the wolf dilemma, the Yellowstone National Park must work closely with the ranchers to reach a smart solution, the burden is on the NP to explain their reasons for objections to policy decisions outside the park. Both the wolves and bison were reintroduced by the YNP with certain agreements. After talking to both the wolf and bison biologists, they seemed to be completely okay with wolves and bison being hunted outside the park boundaries as long as the state's hunting laws are being followed. The concern though that they both voiced is that the genetic pool could suffer since the wolf population isn't extremely large. On the bison side, if you kill those that are migrating, one might be killing those bison who have the important instinct of migration to better weather locations and feeding grounds.

By being on the ground hearing the dilemmas explained firsthand one might think it would be easier to form a solution. Not quite true though. By learning both sides better, we didn't figure out what the best solution would be but rather how complicated the process is and how Yellowstone National Park, conservation groups, as well as ranchers navigate this policymaking process. This trip has shown the class that policymaking is not an easy task to take on, it is complicated with many different issues that have to be addressed.