**Property Rights and Land Usage:   
Conflicts Concerning Bison, Winter Use, and Bioprospecting  
 in Yellowstone National Park**

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1. **Lesson Description:**

This lesson is designed to help students understand underlying causes and effects in several real-world issues involving property rights and land issues in and around Yellowstone National Park, the Nation’s first official park. These issues include the free ranging bison that live and breed within the Park with special reference to the issue of the disease Brucellosis. Brucellosis is an infectious disease, that in the past infected humans with undulant fever but currently spreads from wildlife such as bison and elk to domestic cattle. Once cattle are infected, regulations require the whole herd to be destroyed.

Although most tourists visit Yellowstone in the warm summer months, more than 100,000 visit during the cold, snowy winter season. Many go to experience the geothermal features and wildlife of the park via snowmobile. Snowmobiling in the park is controversial because environmentalists claim that the noise and emissions of snowmobiles harm wildlife as well as air and water quality. Snowmobile advocates point to the recreational mission of the National Park Service (NPS) and the economic benefits to the park’s gateway communities and contend that the new 4 cycle snowmobiles are much quieter and cleaner than their 2 cycle predecessors.

Bioprospecting refers to the search for commercially valuable biochemical compounds in nature. Significant economic value is created from research on biochemical compounds found in the geothermal features of Yellowstone National Park. The issues surrounding bioprospecting in the park involve questions of whether or not such research should be allowed in the unique geothermal features of Yellowstone, how such commercialization of the park might affect the “management, preservation, and protection” of park resources and how the park should share the benefits of the commercialization of compounds derived from biological resources found in the park.

Students will participate in activities that will help them visualize these complex problems and will lead to the creation of their own possible solutions to these controversies. Students will use the concepts of property rights, the “tragedy of the commons”, the role of government, government failure and special interest groups in investigating alternative recommendations for each controversy. Debate, public speaking and research using a variety of media resources will also be emphasized as critical learning skills.

**B) Introduction:**

This lesson will cover public and private land as it pertains to the issues surrounding the roaming of bison off Yellowstone National Park land, the winter use of the park and the bioprospecting activity in the park’s geothermal sites. Brucellosis is a problem for many different economic actors and agents. Government representatives, ranchers, local business interests, and other special interest groups all influence the public policy making process surrounding these controversies. Tourists are often confronted with a limited view of these issues, generally not getting the chance to hear from more than one side of an issue. Ranchers need to protect their herds, local businesses want bison to be easily visible to attract tourists, and advocacy groups want bison to be free to roam. The winter usage issue puts environmentalists and local tourism business people and people of the gateway communities at each park entrance at odds. Although at present, no one is trying to further restrict summer use, the economic viability of local communities in the winter season does affect their ability to provide tourism services during the peak summer period. Those who favor benefit sharing agreements that allow commercial as well as academic researchers access to Yellowstone’s geothermal features and provide the NPS “a share” of the commercial benefits resulting from that research, argue that the park system is in dire need of additional funding and that this is a good way to bring additional revenue to the parks. Opponents argue that the quest for benefits would turn the park’s management toward revenue enhancement and away from the protection and preservation of the park’s unique geothermal resources. The National Park Service is charged with both creating opportunities for recreation and protecting the park’s natural resources, both large and microscopic. The NPS must create policies to balance the conflicting interests of all groups. This lesson will help students to think about these issues in an analytical manner as they are challenged to think critically about all sides of an issue before making their recommendations.

**C) Economic Concepts:**

* Scarcity and Opportunity Costs
* External Costs and Benefits
* The Tragedy of the Commons
* Public Goods
* Economic Role of Government
* Public Choice
* Special Interest Groups
* Government Failure

**D) Indiana Academic Standards Addressed (with summary descriptions; supporting content areas are indicated in parentheses):**

Economics:

E.1.2 Scarcity, opportunity costs and tradeoffs

E.1.4 Positive and negative incentives

E.1.7 Property rights (Government)  
E.3.3 Economic institutions evolve in market systems (Government)  
E.4.9 Government failure (Government)  
E.4.10 Economic decision-making model (Government)

U.S. Government:

USG.1.1 Civic life, political life and private life   
USG.3.17 Special interest groups and their impact on public policy (Economics)  
USG.3.20 Influence of the media on opinion and policy  
USG.5.7 Important citizen actions that monitor and influence government  
USG.5.12 Use information from a variety of resources

Biology:

B.1 Concepts, principles, and theories that enable understanding of the living environment  
B.2 Understanding of how the scientific enterprise operates through examples of historical events

Environmental Science:

ES.1 Investigate the concepts of environmental systems, environmental resources and environmental hazards   
ES.2 Understanding how scientific enterprise operates through examples of historical events

E) Objectives:

*After this lesson students will be able to:*

* Identify several key issues at Yellowstone National Park, including winter use of the facility, brucellosis, and bioprospecting.  
  Distinguish between the different use incentives of public and private lands.
* Identify the importance of property rights in a market economy and understand the “tragedy of the commons”.
* Understand how institutions and incentives can lead to market and government failure.
* Understand how governmental policy decisions are made with the influence of different groups.
* Think analytically and critically about the land use controversies in the park.
* Understand economic concepts such as supply and demand, externalities, public goods and public choice.
* Define their position on key Yellowstone National Park issues.

**F) Daily Lessons**

**Day 1**  
Students will participate in the bison/rhino property rights simulation from the *Focus, Institutions and Markets* curriculum from the Council on Economic Education. Day 1 will include the simulation, discussion of different ideas on property rights, and different mechanisms for maintaining property rights. The “tragedy of the commons”, an economic concept dealing with the overuse of common property, is also introduced. Students will be asked to document ownership of their own property.

**Day 2**  
Students will continue working with the lesson from day 1. During day 2, students will discuss digital property. Feature discussion of the Napster/Metallica debate. To close out this part of the unit, show clip 2: “Economics of Private Property Rights from *Teaching Tools for Microeconomics* from John Stossel and ABC News, which discusses the tragedy of the commons, property rights, and how assigning private property rights to African elephants helped increase their chance of survival.

**Day 3**  
Begin the period with a short quiz including at least the following questions:  
  
1. In your own words, briefly describe the economic term tragedy of the commons.  
2. Briefly discuss the problems associated with the African elephant. How were these problems solved?  
3. How would you solve the problem of illegally sharing files over the internet.

After the quiz, make a transition from the elephant (Africa) to the buffalo (Yellowstone National Park). Begin the PowerPoint presentation (available on project website). The PowerPoint presentation illustrates and provides discussion points on: (1) bison biology and the relationship to the disease Brucellosis; (2) winter use including snowmobiling and it’s impact on wildlife, and (3) bioprospecting issues at Yellowstone National Park. After showing the PowerPoint presentation, students will be asked to move into one of the following 6 groups. Each group will take a look at one side of each one of these issues (one group taking one side of each issue).

1. Bison: (a) Freedom to roam off NPS land and (b) restricting bison to NPS land.   
2. Winter Use: (a) Expanded use of Yellowstone National Park by snowmobilers and (b) increased restrictions on snowmobile use in the Park.  
3. Bioprospecting: (a) Access to geothermal features in the Park with a benefit-sharing plan and (b) severely restricted access to geothermal areas of the Park to biological researchers.

Students will go to the library to research their topic.

**Day 4/5**  
Students will go to the library to continue their research. Pass out articles to each group on appropriate topics. If groups are experiencing difficulty focusing on issues, instructor will provide clues. For example:

1. Is Brucellosis really the issue?  
2. Should the public receive revenue from the development of commercial products resulting from bioprospecting in Yellowstone?

3. What role should profit and business play in the winter use of snowmobiles?

**Day 6/7**

Students will begin to debate the costs and benefits of each issue. Each side will have 7 minutes to present their topic. One opportunity for rebuttal will be allowed per group lasting no more than 3 minutes. Questions will then be taken from the audience. Audience members will vote on who is more convincing. The winning debate team will get 10 bonus points. The following rubric will be used for grading each group:

Organization \_\_\_\_\_\_\_\_\_\_\_\_ /20

Information \_\_\_\_\_\_\_\_\_\_\_\_ /20

Persuasiveness \_\_\_\_\_\_\_\_\_\_\_\_ /20   
Intangible \_\_\_\_\_\_\_\_\_\_\_\_ /10

Total \_\_\_\_\_\_\_\_\_\_\_\_ /70

There will be a debriefing each day. Students will leave positive feedback for each presenter, as this is also an exercise in public speaking.

**Day 8**Students will write a 1-2 page paper on the following topics:

1. Discuss the problem with snowmobile usage in Yellowstone National Park. Why are people concerned around the park? If you were in charge of the situation, what would you do and why?
2. Define bioprospecting. In your writing, address two benefits and two costs of allowing bioprospectors access-use of Yellowstone National Park’s geothermal resources where thermophylles live.
3. What is brucellosis? How does it relate to the bison in Yellowstone National Park? What role do elk play in brucellosis? Why are so many of the cattle owners concerned that the bison roam on public land? If you were in charge of this situation, how would you rectify the problem?
4. What is the tragedy of the commons? What role does it play in the problems at Yellowstone National Park?

Grading will be based on the following rubric:

Organization \_\_\_\_\_\_\_/20  
Accuracy \_\_\_\_\_\_\_/20   
Answering the question \_\_\_\_\_\_\_/10  
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Total \_\_\_\_\_\_\_/50

**G) Resources on issues:**

Wildlife Responses To Motorized Winter Recreation In Yellowstone: 2008 Annual Report, National Park Service, U.S. Department of the Interior, <http://www.nps.gov/yell/parkmgmt/upload/2008wildlife_final.pdf>

Economic Analysis: Proposed Winter Use Plans for the Greater Yellowstone Area, National Park Service, U.S. Department of the Interior, <http://www.nps.gov/yell/parkmgmt/upload/economic_analysis_10-23-08.pdf>

Winter Use Technical Documents, National Park Service, U.S. Department of the Interior,   
<http://www.nps.gov/yell/parkmgmt/winterusetechnicaldocuments.htm>

Brucellosis and Yellowstone Bison, report of U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS),   
<http://www.aphis.usda.gov/animal_health/animal_dis_spec/cattle/downloads/cattle-bison.pdf>

State of Montana Brucellosis Action Plan, January 13, 2009, <http://liv.mt.gov/Brucellosis/BAP_Final_011309.pdf>

Status review of public lands grazing on the Gallatin National Forest Hebgen Lake and Gardiner Ranger Districts: A critique of land management decisions on National Forest lands and their impact on wild bison in Yellowstone, November 2007, Buffalo Field Campaign, <http://www.buffalofieldcampaign.org/legal/hbbisontrap/geist_stat_rev.pdf>

Yellowstone Bioprospecting Online Resources, Microbial Life Educational Resources, <http://serc.carleton.edu/microbelife/topics/yellowstonebioprospecting/resources.html>

Biodiversity Access and Benefits-Sharing Policies for Protected Area, United Nations University/Institutte of Advanced Studies Report, <http://www.ias.unu.edu/binaries/UNUIAS_ProtectedAreasReport.pdf>

NPS Evaluates Benefits-Sharing with Researchers: Draft Environmental Impact Statement Available for Review, September, 2006, National Park Services,

Comments on National Park Service Benefits-Sharing Draft Environmental Impact Statement (Servicewide), <http://www.parksnotforsale.org/pdf/Comments%20on%20Benefits-Sharing.pdf>

Yellowstone Resources and Issues, Chapter 8, Park Issues, Division of Interpretation, Yellowstone National Park, National Park Service, <http://home.nps.gov/yell/planyourvisit/upload/ri09ch8.pdf>

Center for Disease Control and Prevention entry on Brucellosis, <http://www.cdc.gov/ncidod/dbmd/diseaseinfo/Brucellosis_g.htm>

*Focus, Institutions and Markets*, Council on Economic Education, <http://store.councilforeconed.org/institutions.html>

Teaching Tools for Microeconomics, John Stossel, ABC News, <http://abcnews.go.com/2020/Stossel/story?id=1936941>