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They Shoot Bison, Don't They? Discussing Ethics in Conservation Courses.

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Abstract

The ethical implications of conservation actions are worth discussing in environmental science and conservation courses. Consideration of ethics sharpens student critical-thinking skills, and illustrates the difficulty of designing conservation strategies in the real world. In this paper a framework for briefly introducing ethics philosophy in a large-enrollment environmental science class is presented, along with a case study in which these philosophies can be discussed. The case study involves the current policy of killing wild bison (*Bos bison*) that leave Yellowstone National Park in winter. Bison that wander onto cattle wintering grounds are viewed by local ranchers as potential sources of the disease brucellosis. Exposure of cattle to this disease would be economically devastating to the regional cattle industry. Students are asked to weigh the needs of

local ranchers, the National Park Service, recreational users of the Yellowstone region, and the bison themselves in considering the ethics of the current management policy.

Introduction

When presenting potential solutions to conservation problems, instructors in environmental science or conservation courses may focus on either or both of two approaches. Many instructors may concentrate on technical aspects of possible solutions -- in effect, emphasizing what can be done. On the other hand, instructors may be less inclined to focus on ethical considerations involved in solving conservation problems, thus there might be less effort to explore what should be done. There are several reasons why some instructors might shy away from consideration of ethical aspects of conservation issues. For most instructors, undergraduate philosophy classes were taken a long time ago, and therefore the moral reasoning behind the conservation ethic may be less familiar. In addition, lecturing students on a specific moral justification may open the instructor to charges of bias. On the other hand, trying to cover all possible moral stands on an issue may be confusing to both the students and the lecturer, and leave little time to consider other aspects of the issue. In a large (>50 students) lecture course, it may seem difficult to open the class period to an intense discussion of ethics, especially if the discussion could quickly degenerate into polarized stands.

The ethical aspects of conservation issues deserve

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Acknowledgments. Many of the ideas supporting this classroom approach were generated in the 1997 Workshop on Bioethics, Purdue University. I thank Gary Comstock of Iowa State University, and Martin Curd, Lilly-Marlene Russow and Mark Gibney of Purdue for coordinating and leading the workshop, and the School of Agriculture, Purdue University, for supporting my participation. I also thank the undergraduate students enrolled in FNR 488 Global Environmental Issues for their participation in the class exercise.

attention in undergraduate coursework. Ethics provide an excellent opportunity to enhance student skills in critical thinking by making students justify why they believe what they do (Nolan and Nolan, 1997). In undergraduate courses that are taken by students from a variety of backgrounds and disciplines, discussions of moral philosophy can expand the students' appreciation of divergent opinions. Finally, a successful resolution of a conflict requires a complete understanding of the motivations held by different sides. Thus, success in most conservation conflicts will require a study of the philosophies and motives of participants. The ethical considerations are therefore well worth exploring in conservation biology classes, even in large lecture classes not structured well for intimate discussions. The use of a case study can focus student attention to a specific issue, and allow exploration of different ethical positions (Barden et al., 1997). In this article, a simplified approach to introducing ethical concepts in a large-enrollment lecture course is described, with an example of a controversial topic on which a discussion of ethical issues may be based.

Basic Philosophy 101

A simple presentation of some alternative philosophical approaches can provide a useful framework for students to express their opinions. Outlined below is a description of two basic philosophical approaches that are useful in this context. In my class presentations, the philosophy descriptions are coupled with a non-conservation example that should be familiar to students. The descriptions are based on discussions at a workshop on bioethics held in May 1997 at Purdue University. Rachels (1993) provided an introduction to moral philosophy that proved useful in this workshop and in developing subsequent class exercises.

Utilitarian approaches. One major approach to deciding what one should do in a given situation is defined as utilitarianism. In this approach, one assesses the possible good and bad consequences of possible actions, and weighs these consequences. One then chooses the action that results in the maximum possible good. Under this philosophy, actions can be taken that might harm certain individuals in some way, as long as the good enjoyed by the benefactors of the action outweighs the harm caused. The essence of this approach is captured in the phrase, "the ends justify the means." In class, the example of highway speed limits is used. While speeds that are lower than the maximum possible may be inconvenient to some drivers, and costly to a few (such as delivery agents), societal gains in lower accident rates and fewer highway deaths are generally considered important enough to support speed limits. The benefits to society from highway speed limits (the ends) generally outweigh the costs to individuals.

Deontological approaches. As an alternative to the utilitarian view, rights-based or deontological approaches seek to avoid actions that cause the maximum harm. In this approach, one assesses the possible good and bad consequences of actions, and refuses to take the action that causes the most serious harm. Under rights-based philosophies, "the ends never justify the means," in that it is never acceptable to inflict certain harms on individuals even if great benefits might accrue to others. Opposition to the death penalty can be used as an example. Some individuals believe that each person has an inalienable right to exist and that society cannot condone killing an individual regardless of the relative value of the possible benefit (protection of society from a serial killer or child molester, for instance).

It should be noted that either utilitarian or deontological approaches can be used to justify action in a specific case. Thus, a rights-based argument could be used to justify or oppose highway speed limits, or to argue for or against the death penalty. The examples are given to illustrate the logic behind each approach, not to associate a particular moral stand (e.g., "no to the death penalty") with a particular philosophical approach.

The Case Study: Bison and Brucellosis.

In the winter of 1996-97, the management of bison (*Bos bison*) outside Yellowstone National Park was the focus of intense national media attention. The park's bison herds move outside the park boundaries during harsh winters. In some winters, wandering bison may come into contact with cattle belonging to local ranchers. Current management policy allows state wildlife biologists to kill bison in winter to prevent the possible spread of disease (brucellosis, see below for details) to free-range cattle. In the winter 1996-1997, about 1100 of the park's bison herd were killed by state wildlife biologists in Montana. Overall, Yellowstone's bison herd was reduced by approximately half through the shootings and other winter mortality factors (Holden, 1997). Keiter (1997) provides a good background in the history, politics and management issues involved in the controversy. The policy of killing all bison that wander out of the park to avoid the potential economic loss that brucellosis represents to cattle ranchers is a potent issue with which to stimulate debate.

Yellowstone National Park. The flagship of the National Park System, Yellowstone National Park was established in 1872. The park is filled with scenic wonders, such as geysers and hot springs, and is famous for the visibility of its large native mammals. The park is not fenced, and to some degree the boundaries of the park were established without regard to the dynamics of the natural ecosystems being included. Thus native animals such as bison and elk (*Cervus elaphus*) regularly wander in and out of the park.

Bison are a familiar sight to park visitors, and have been considered a “keystone” species in the grassland ecosystems that they inhabit (Knapp, et al., 1999). Much of the landscape surrounding the park is federally owned, and is managed as the Greater Yellowstone management area (Keiter, 1997). No hunting or cattle grazing is allowed inside the park, but much of the adjacent federal land is leased to ranchers.

Brucellosis. Brucellosis causes abortion of fetuses in cattle. It is caused by a bacterium, *Brucella abortus*, that is passed from animal to animal by contact with infected tissues. Passage of brucellosis from cattle to bison has been documented. In fact, the disease was likely introduced to the Yellowstone bison population from infected cattle around 1917 (Meagher and Meyer, 1994). The transmission of the disease from bison to cattle in open range settings has never been documented. The killing of bison in winter is therefore done to eliminate the possibility of disease transmission, even in the absence of proof that such transmission occurs. Berger and Cain (1999) summarize current knowledge on the role that the disease may play in the reproductive cycle of the Yellowstone bison herds.

Establishment of brucellosis in a cattle herd is devastating both to the individual rancher and regionally. Once brucellosis is diagnosed in cattle, the entire herd to which the infected individuals belong must be tested and usually slaughtered. In addition, interstate shipment of beef is restricted from regions where brucellosis occurs, and substantial vaccination costs must be borne by the cattle industry. Substantial economic benefits accrue to regions that can certify their cattle as “brucellosis-free.” Diagnosis of the disease can mean the loss of this certification and associated benefits for the entire region, until the disease is confirmed as eradicated (Keiter, 1997). Idaho, Wyoming and Montana are certified as brucellosis-free, and the ranching industry places substantial political pressure to support public actions that appear to maintain this certification.

Bison and cattle. For many decades, the bison population of Yellowstone National Park was small enough that few bison left the park in winter. Bison were almost eradicated locally in the latter part of the 1800s, and animals were imported from Montana and Texas to augment the dwindling numbers (Keiter, 1997). Until the 1960s, the park bison were heavily managed, including population culling when numbers exceeded management goals. Since the 1960s, a more “hands-off” policy has been adopted by the National Park Service, and the numbers of bison have increased. Natural population regulation is now done by harsh winter conditions. The park herd increased from 397 individuals in 1967 to 3000-3500 in 1996 (Keiter, 1997). It is not known how

many female bison carry the bacillum; about 20% might be infectious, based on tests conducted on a very small sample (about 20 individuals) of the bison shot in the winter of 1996-1997 (Baskin, 1997).

The bison herds of Yellowstone normally spend their summers inside the park where they do not come in contact with cattle. Conflict thus arises only in harsh winters when individuals move outside the park in search of adequate forage. Wandering bison move onto both public grazing lands and private ranches. Under state laws that govern wildlife and agricultural diseases, Montana and Idaho have established a “zero-tolerance” policy for bison outside the park, while Wyoming allows some bison to leave the park and return (Keiter, 1997). Wild bison cannot be herded effectively and tend to trample fences in deep snow. The wild country of northern Yellowstone Park could not be fenced completely without large impact on the natural communities within the park.

Economics. Although state officials justify the policy of killing wandering bison by citing the economic damage that would be caused by bison-to-cattle disease transmission, ranching actually makes up a small portion of the regional economy (<6% of the regional \$4.2 billion economy in 1994. Bangs and Fritts, 1996). Tourism is a much larger portion of the regional economy, and wild, free-ranging bison are one of the wildlife sights that tourists want to see. Eliminating one-third of the regional bison herd could have a severe negative impact on the local economy if fewer tourists were satisfied. In addition, *Brucella abortus* is present in wild elk in the Yellowstone area. Elk are more than ten times more common in the region than bison, are highly visible and valued by tourists and residents alike, and are the focus of a sport hunting industry outside the park (Bangs and Fritts, 1996; Keiter, 1997). No effort is made to separate cattle and elk in winter, thus the bison policy cannot ensure that economic losses due to brucellosis will be avoided. On the other hand, ranching is also important to tourism in that it is a familiar part of the Western “way of life” that many tourists come to see.

Teaching Notes

Defining the two philosophical approaches and giving examples of the logic usually takes about 15 minutes of a 50-minute lecture period. The rest of the period is then used to introduce the case study (about 15 minutes), and ask for student discussion of the ethical implications of the proposed actions. The lecture portion of the presentation is illustrated by slides of Yellowstone and bison, and overheads summarizing the basic details. Film clips of the shootings could be shown, but might be considered prejudicial to students from agriculture or ranching

backgrounds, as television news clips were somewhat gory.

It can be useful to present as few details as in the introduction as necessary for a basic understanding of the issue. Additional details can then be introduced during the discussion to get the students to think about their stated opinions. For instance, if a student presents a particularly one-sided argument (e.g., that the economic needs of the ranchers are paramount), one could ask if his or her opinion would change if one additional fact were known (that ranching makes up a minor component of the local economy). After the discussion, the general themes are noted, and a theme that was not discussed during the class session is then selected to be the focus of a major essay question on the next exam.

In the fall 1997 semester of my environmental science class, a great deal of the discussion concerned the rights of the individuals involved, such as ranchers' rights to make an economic living, private property owners' rights, and the rights of all Americans to enjoy the knowledge that bison roam freely. No one in class brought up the question of whether the bison themselves have rights that should be defended. Therefore, the subsequent exam question asked the students to state explicitly whether bison have intrinsic rights. The question used and several responses are given in Box 1, illustrating the range of reasoning used by students in their written essays.

In the fall 1997 semester, about 15 of the 61 students in the class voiced an opinion or comment during the classroom discussion for this exercise. While this represented a minority of the class, this was a greater level of student participation than is typical of a normal lecture session in this class. Several students were vocal enough that they would have dominated the discussion if allowed, therefore I intentionally prevented that by calling on quieter students that wished to state their comments. I explicitly told the class that I wished a diversity of opinions, which seemed to satisfy the more vocal students that were being passed over at times. At the end of the class exercise, I provided a list of suggested readings for students that wished more information. In addition, students approached me for more information or more discussion during the next several class sessions. An independent, voluntary discussion session several weeks later on a related topic of wildlife management in Yellowstone National Park (see Carroll et al. 1997) drew a full crowd of active participants. These subsequent opportunities for discussion allowed for a fuller consideration of the topic for students that were particularly interested.

When grading the essay questions, the students were evaluated on their command of the facts from the case study presented in class, and their use of these facts in presenting a logical, concise argument. The students had to identify whether their argument used a deontological or

utilitarian framework, and correctly explain how their essay fit the philosophical framework they identified. A high-quality answer therefore was one that expressed a specific opinion, backed that opinion with supportive facts, and correctly identified the philosophical approach that they were taking.

Summary

Discussing the ethical implications of what should be done in environmental planning can be a critical part of undergraduate conservation classes. A lecture on basic philosophy early in the term can provide a framework upon which discussion of these issues can be based throughout the course. Also, devoting time to this topic early in the class establishes the ethical side of issues as a legitimate area of exploration, while exposing students to the diversity of attitudes that are present in the classroom. The format described above gives students an opportunity to express opinions in a large class setting, hear other students' opinions, change or defend their arguments in the face of additional information, and then express opinions in a written format. Challenging students to defend their spoken and written opinions adds to the students' ability to understand their own biases and to think rationally. Management issues involving charismatic wildlife such as bison and elk provide an excellent educational opportunity for such challenges (see Carroll et al., 1997 for an additional case study on a related topic).

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Box 1. Responses of students to an essay exam question concerning ethical issues. Following the classroom exercise in ethical thinking described in the text, students are asked to write an essay response to the question listed below. Five (out of 61) student responses are presented here to demonstrate the breadth of ethical stances that students took in their responses. Student responses are used with their permission.

Question: In class, I described how one-third of the bison herd in Yellowstone National Park was killed by state wildlife biologists last winter, and I suggested that both major philosophical approaches that I defined (utilitarian and deontological) could be used either to support or oppose this killing. A) Do you agree that killing the bison is an acceptable method of reducing the chance that bison might pass brucellosis to cattle? Why or why not? Be sure to identify which philosophical approach is more consistent with your answer. B) To some people, the bison themselves have "rights" that have to be considered in solving this problem. Do you agree with this attitude? Why or why not?

1. I do not agree that killing the buffalo is an acceptable method of reducing the chance that buffalo might infect cattle with brucellosis. I use the rights-based, deontological approach in my argument because I believe in finding solutions to problems that actually produce the least amount of harm to all in society. You may wonder why, then, would killing several thousand cattle that get infected with brucellosis be less harmful than killing 1000 buffalo. The answer can be approached in two ways. It seems that because no real testing has been done on whether or not buffalo can transmit the disease to cattle, ranchers are just assuming that buffalo are a means of acquiring the disease for the cattle. Organisms should not be killed just based on

an assumption. I would advocate strongly the immediate study of this phenomenon to see if buffalo in fact can even transmit the disease. To insure that no cattle would be infected while we wait for the results of the study, I would find the means to vaccinate all the remaining buffalo in Yellowstone National Park. This may not make sense economically, but the deontological approach provides an argument for greater financial aid for natural park preservation. Why greater financial support? Because of the second reason why the buffalo should be protected: the buffalo themselves do have "rights" to their grazing land, just as much as the ranchers have "rights" to raise cattle on that land. We may not be able to keep the environment in its natural state, but we have the potential means to compromise and allow the formation of a new ecosystem where buffalo and cattle can graze together. This is a much better solution than killing all the buffalo and taking away their right to live in an area that they have lived in for many years.

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2. I do agree that killing buffalo is acceptable. I believe that the human race is the supreme being on earth because God intended it to be this way. I don't think animals have souls. They do need to be treated humanely and be preserved to the best of our abilities. However, ultimately we have to look out for what is in our best interest. Cattle are a major source of food on this planet. It is better that we try to control the spread of disease in our food supply than to say that a buffalo has a right to live and affect the human race negatively.

I do believe that the buffalo and all other animals should have some rights because they were put on this earth with us. But in this situation the human interest outweighs the buffalo's interest. I am not saying that there aren't situations where the animals' rights are more important, but in this situation I have to say the human interest is more important.

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3. I do not believe this to be an effective way of handling the situation. I don't think enough time or effort has been spent on finding alternatives. I take a deontological approach, the rights-based philosophy. This philosophy assumes the ends never justify the means. I don't think it is moral or ethical to kill the buffalo, when we don't even know if cows can get it from the buffalo. We just don't know enough to be killing every buffalo who might have the disease. The ends do not justify the means, whether it's harmful to the ranchers or not. I believe the buffalo have rights that humans must

defend. I believe that if they are alive, they have rights. The fact that they are here on earth, sharing the same land, gives them rights. Just because the buffalo happen to be encroaching upon what humans have claimed to be their territory, it nonetheless does not make it justifiable to extinguish them.

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4. This issue is similar to almost all environmental issues in our country. You have to consider the citizens' well-being versus the rights of animals. Do the people who raise cattle have more rights than the people who visit to see the buffalo? First and foremost, more research and education must go into solving the ways of transmission of brucellosis to cattle and buffalo. Since this hasn't happened, I must come up with an alternative solution. I prefer to take the utilitarian approach of maximizing the amount of good. Until we know more about the disease, the only solution that maximizes the good is killing the buffalo. This obviously makes the ranchers happy because it guarantees healthy cattle. It might not seem to make the "buffalo supporters" happy, but I will try to explain. The buffalo have no predators and thus have the ability to grow too large of a population. From the given facts I'll assume a harsh winter only occurs 1 out of 4 years. The situation must be monitored as to numbers killed. If after killing, the buffalo still maintain healthy population sizes, then the people who enjoy buffalo will have enough animals to see. If the killing gets out of hand, everyone must be warned that the shooting must cease. This leads to a deontological position of avoiding the worst case scenario,

which would be killing all the buffalo.

I agree that the buffalo have rights to maintain suitable population sizes that lead to healthy buffalo. This does leave room for buffalo to be shot, but only if numbers are above healthy levels. In the end, neither ranchers or buffalo supporters will be totally happy. If you can maximize good as much as possible for both sides, then they will be able to co-exist.

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5. I do not think it is the most effective method, but I believe that ranchers have the right to protect their cattle from even the threat of contamination. The livelihood of Americans is more important than the buffalo. However, I do not want the bison exterminated, to be sure. I hope that the state can find some better alternative than the ones currently in use. But, yes, I do believe it is acceptable because it seems to be the only safeguard right now.

I do not believe that animals have rights. However, I also do not believe in killing something without reason, whether it be for food, to protect livestock, etc. I love wild animals and I hope the bison are around for a long time, but I do not think that ranchers should be denied their rights to protect what is theirs. It is the responsibility of the government, I think, to either help protect the cattle, or if public opinion calls for a stop to the killing, to reimburse ranchers for any harm that may be done. Hopefully, though, scientists can solve this problem somehow.

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Attitudes and Perceptions of Recent Agricultural Sciences Graduates

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Abstract

The study involved alumni from the College of Agricultural Sciences at Oregon State University. The objective was to identify perceptions of alumni regarding their education. Survey results from alumni of the College of Agricultural Sciences (CAS) indicated that 1) most alumni were transfer students, 2) alumni were satisfied with the CAS

portion of their educational experience but not as satisfied with the university-wide portion of their education, 3) the research efforts of the CAS instructors were generally appreciated by alumni, 4) 81.4 percent of the alumni were employed, 5) most employment was related to the students' major (67.9 percent), and 6) alumni were not active in formal continuing education.